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The Impact of Generative Artificial Intelligence Capabilities on Entrepreneurial Resilience: An Empirical Study of Taiwanese Small and Medium-sized Enterprises

Han-Pin Yu and Feng-Jyh Lin

Abstract

The rapid development of generative artificial intelligence presents transformative opportunities for resource-constrained small and medium-sized enterprises (SMEs). This study investigates how generative AI strengthens the entrepreneurial resilience of Taiwanese SMEs through the mediating role of entrepreneurial orientation, while examining the moderating influence of market turbulence. Employing structural equation modeling, we analyze survey data from 350 Taiwanese SMEs to examine the relationships among generative AI capabilities, entrepreneurial orientation, entrepreneurial resilience, and market turbulence. Our findings reveal that generative AI capabilities significantly and positively influence entrepreneurial orientation, validating that this technology, as a lower-order dynamic capability, effectively supports the development of higher-order entrepreneurial orientation. Entrepreneurial orientation demonstrates significant positive effects on entrepreneurial resilience, while generative AI capabilities directly and positively impact resilience. Mediation analysis confirms that entrepreneurial orientation plays a partial mediating role, and market turbulence significantly enhances the positive influence of entrepreneurial orientation on entrepreneurial resilience. Theoretically, this research integrates dynamic capability theory and entrepreneurial orientation theory, constructing a comprehensive framework for understanding how generative AI influences organizational resilience. Practically, our findings provide strategic guidance for SME managers regarding technology adoption, recommending prioritized investments in human skill development, technological infrastructure construction, and data-driven culture cultivation. This study offers crucial theoretical foundations and practical guidance for Taiwanese SMEs navigating digital transformation.

Keywords: Generative artificial intelligence, Entrepreneurial orientation, Entrepreneurial resilience, Dynamic capabilities, Market turbulence, Small and medium-sized enterprises, Digital transformation

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1. Introduction

The rapid development of Generative Artificial Intelligence (generative AI) is fundamentally reshaping global industrial ecosystems, with particularly profound implications for small and medium-sized enterprises (SMEs)[1]. Through advanced machine learning algorithms, this technology automates tedious processes, enhances operational efficiency, and optimizes decision-making quality through data-driven support systems, thereby empowering resource-constrained SMEs with technological capabilities previously available only to large corporations[1].

The core value of generative AI lies in its ability to autonomously create original content, including text, images, videos, and other multimedia materials, thereby revolutionizing traditional marketing strategies and product development models. This content generation capability enables resource-limited SMEs to obtain professional-grade creative outputs at lower costs, achieving democratization of technology application[2]. More importantly, the adoption of generative AI tools can significantly enhance SMEs' entrepreneurial resilience, enabling them to adapt more effectively and capitalize on emerging business opportunities when facing market uncertainties.

Within Taiwan's economic structure, SMEs play a pivotal role. According to statistics from the Small and Medium Enterprise and Startup Administration, Ministry of Economic Affairs, SMEs account for over 98% of all enterprises and provide employment for more than 80% of the workforce, serving as a crucial pillar of Taiwan's economic development. However, facing the global wave of digital transformation and the rapid proliferation of generative AI technologies, Taiwanese SMEs still encounter numerous challenges in technology adoption and application. Against this backdrop, exploring how generative AI tools such as ChatGPT and Midjourney can be effectively integrated into Taiwanese SMEs' entrepreneurial decision-making and marketing strategies, and analyzing their substantive impact on business model transformation, holds significant theoretical value and practical implications.

Based on this research context, this study aims to systematically analyze the adoption patterns and application scenarios of generative AI tools in Taiwanese SMEs' entrepreneurial decision-making processes; examine the transformative effects of generative AI technology on SME marketing strategies; explore the impact of generative AI on various dimensions of SME entrepreneurial orientation; identify key challenges and barriers Taiwanese SMEs face when adopting generative AI; and construct an integrative theoretical framework that systematically elucidates the relationships among generative AI technology, entrepreneurial orientation, marketing strategies, and firm performance.

To achieve these research objectives, this study addresses the following core questions: First, how do Taiwanese SMEs adopt and utilize generative AI tools in entrepreneurial decision-making and daily operations, and which business functions and processes primarily benefit from these tools? Second, how does generative AI transform traditional marketing content production models, and what impacts does it have on marketing efficiency and effectiveness? Third, how does generative AI influence firms' risk-taking propensity, innovation capacity, proactive thinking, and competitive aggressiveness? Fourth, how does generative AI adoption affect firm performance through enhanced entrepreneurial orientation and optimized marketing strategies? Fifth, what barriers do Taiwanese SMEs face when adopting generative AI, and how do these factors influence the success of technology adoption?

This study focuses on Taiwanese SMEs with fewer than 200 employees, prioritizing firms that have adopted or plan to adopt generative AI tools. Regarding technology scope, this research primarily examines mainstream generative AI tools such as ChatGPT and Midjourney. In terms of application domains, the study focuses on entrepreneurial decision-making and marketing strategy. We employ a mixed-methods research design, collecting data through in-depth interviews and surveys. However, as generative AI technology application remains in its developmental stage, caution must be exercised in inferring causal relationships. Additionally, this study adopts a cross-sectional research design, which cannot fully capture the dynamic processes and long-term impacts of technology adoption. Finally, the research context is limited to Taiwanese SMEs, and cross-cultural and cross-national inferences from our findings should be approached cautiously.

2. Literature Review

Generative artificial intelligence, as an emerging technological paradigm, is profoundly transforming SMEs' operational models and competitive dynamics. Through advanced machine learning algorithms, this technology can autonomously generate diverse forms of original content, providing resource-constrained SMEs with unprecedented innovation opportunities[3]. Shore et al.'s research indicates that generative AI adoption enables SMEs to build, integrate, reconfigure, and release resources as dynamic capabilities, thereby identifying and seizing emerging business opportunities under rapidly changing market conditions. This capability development is crucial for SMEs to build entrepreneurial resilience during crisis periods.

Rajaram and Tinguely further elaborate how generative AI achieves democratization of technology application, enabling SMEs to obtain

technological capabilities previously available only to large corporations at lower costs. This technological equity phenomenon promotes balanced development between scalability and creativity among enterprises[4]. Al-Mamary's research confirms that the transformative power of artificial intelligence demonstrates significant benefits in the entrepreneurial domain, enhancing the success probability of entrepreneurial ventures[5]. Agbaakin emphasizes that positioning AI as a strategic growth catalyst holds important significance for SME development[6].

The integration of generative AI enables SMEs to predict market trends through data analysis, optimize resource allocation, and rapidly adjust operational strategies, thereby enhancing their recovery capacity when facing external shocks. Drydakis's research confirms that during the COVID-19 pandemic, artificial intelligence significantly reduced SMEs' operational risks, validating from a dynamic capability perspective the technology's supporting role in enterprise resilience[7].

Kusetogullari et al.'s systematic literature review of generative AI in entrepreneurship research indicates that this technology's application in the entrepreneurial field is in a rapid development stage[8], with its impact mechanisms on entrepreneurial orientation requiring deeper theoretical exploration and empirical research. Julie et al.'s research explores AI's transformative effects on entrepreneurial activities regarding firm performance, finding that technology adoption can significantly enhance firms' innovation capability and market responsiveness[9]. Tran and Murphy's editorial commentary emphasizes that generative AI's impact on entrepreneurial performance is an important issue of mutual concern in both academia and practice[10].

Generative AI's application in marketing is fundamentally transforming traditional marketing strategies and execution models. Bartelt and Röser's research indicates that generative AI is transforming the operational components of marketing processes, representing a significant paradigm shift in marketing[11]. This transformation primarily manifests in content production automation, enhanced customer personalization experiences, and optimized data-driven decision-making. Abrokwah-Larbi proposes a theoretical framework and research propositions[12] for generative AI in customer personalization development for SMEs, emphasizing the technology's potential in enhancing customer relationship management effectiveness.

From a practical application perspective, generative AI enables SMEs to produce high-quality marketing content at lower costs, including social media posts, product descriptions, advertising copy, and visual designs. Gabelaia's systematic literature review and qualitative research examine AI's impact on

shaping SME advertising strategies, finding that technology adoption can significantly enhance advertising precision and effectiveness[13]. Srivastava et al. further elaborate how AI-driven customer engagement strategies help small businesses build deeper customer relationships, enhancing customer satisfaction and loyalty through personalized interactions[14].

Notably, generative AI's application in marketing strategies extends beyond content production automation to strategic planning and decision support. Ocran et al.'s research indicates that AI-driven business analytics can unlock value for SMEs, assisting enterprises in formulating more precise marketing strategies through predictive and prescriptive analytics[15]. Singh et al. explore how generative AI transforms business models, including research, innovation, market deployment, and future business model shifts[16], with marketing strategy innovation as a key issue.

However, generative AI's application in marketing also faces numerous challenges. Amankwah-Amoah et al.'s research warns of the potentially disruptive impact of generative AI on creative industries, including opportunities, challenges, and research agendas. This research emphasizes that while generative AI provides unprecedented creative tools, enterprises must carefully evaluate the technology adoption's impact on brand authenticity, creative originality, and ethical considerations. Therefore, SMEs applying generative AI to marketing strategies need to strike an appropriate balance between technological benefits and potential risks[17].

Generative AI's impact on SMEs spans multiple business functional domains, from operational efficiency enhancement to strategic decision optimization, demonstrating comprehensive transformation potential. Dinh et al.'s research systematically explores AI applications in SMEs, analyzing how various technologies and applications enhance enterprise functions. This research indicates that generative AI can effectively support SMEs' core business processes, including customer service, product development, supply chain management, and financial planning[18].

In the era of generative AI, this strategy is particularly critical, as generative AI tools can provide rich data insights and automation support, further enhancing SMEs' decision-making efficiency and innovation capabilities in complex market environments[19]. This technology not only reduces the vulnerability of SMEs caused by force majeure factors such as pandemics, but also accelerates post-pandemic recovery and sustainable development through enhanced digitalization[20]. This digital transformation is crucial for improving SMEs' overall resilience and sustainable business capabilities, enabling them to maintain competitiveness and explore new markets amid global economic turbulence[21,22]. In view of this, this study will focus on how generative AI

empowers SMEs to overcome challenges and achieve transformation through innovation and strategic adjustment in the “new normal” of the post-pandemic era[23]. Specifically, generative AI assists SMEs in recovering from the negative impacts of the pandemic and achieving sustainable development through digital transformation. This transformation encompasses innovation in business models, deepening of customer relationships, and establishment of more resilient supply chains within the digital ecosystem[24]. Meanwhile, the adoption of generative AI tools can significantly enhance SMEs’ entrepreneurial resilience, enabling them to more effectively respond to challenges and seize emerging opportunities when facing high market uncertainty.

3. Research Methods

3.1 Research Design and Theoretical Framework

The study employs an empirical research design to investigate how generative AI tools, as dynamic capabilities, enhance Taiwanese SMEs’ entrepreneurial resilience through the mediating role of entrepreneurial orientation, with particular attention to the moderating effect of market turbulence. Based on the theoretical framework proposed by Shore et al.[4], we construct our research model to clarify the complex relationships among generative AI, entrepreneurial orientation, market turbulence, and entrepreneurial resilience.

The core hypothesis of this study is that generative AI positively influences SMEs’ entrepreneurial orientation through three key dimensions-human skills, technological infrastructure, and data-driven culture-thereby enhancing their entrepreneurial resilience in responding to market turbulence. Additionally, market turbulence plays a moderating role between entrepreneurial orientation and entrepreneurial resilience. When external environmental uncertainty increases, generative AI-driven entrepreneurial orientation can more effectively translate into enterprise adaptability.

3.2 Research Model Construction

Based on dynamic capability theory and entrepreneurial orientation theory, we construct our theoretical model. Let generative AI capability be X , entrepreneurial orientation be M , entrepreneurial resilience be Y , and market turbulence be the moderating variable W . We propose the following basic structural equations.

1. Main effects model are shown below

$$M = \alpha_1 + \beta_1 X + \varepsilon_1 \tag{1}$$

$$Y = \alpha_2 + \beta_2 M + \beta_3 X + \varepsilon_2 \tag{2}$$

where: i. β_1 represents the direct effect of generative AI on entrepreneurial orientation.

ii. β_2 represents the direct effect of entrepreneurial orientation on entrepreneurial resilience.

iii. β_3 represents the direct effect of generative AI on entrepreneurial resilience, and ε_1 and ε_2 are error terms.

2. Mediation model

The mediating effect of entrepreneurial orientation can be expressed through the following path, and the total effect is shown in Eq.(4)

$$\text{Indirect effect} = \beta_1 \times \beta_2 \tag{3}$$

$$\text{Total effect} = \beta_3 + (\beta_1 \times \beta_2) \tag{4}$$

3. Moderation model

To test the moderating effect of market turbulence, we introduce an interaction term in the relationship between entrepreneurial orientation and entrepreneurial resilience

$$Y = \alpha_3 + \beta_4 M + \beta_5 W + \beta_6 (M \times W) + \varepsilon_3 \tag{5}$$

where β_6 is the moderation coefficient. If β_6 is significant, market turbulence significantly moderates the influence of entrepreneurial orientation on entrepreneurial resilience.

4. Complete moderated mediation model

Integrating mediation and moderation effects, the complete model can be expressed as

$$Y = \alpha_4 + \beta_7 X + \beta_8 M + \beta_9 W + \beta_{10} (M \times W) + \varepsilon_4 \tag{6}$$

The model allows simultaneous examination of the indirect influence of generative AI on entrepreneurial resilience through entrepreneurial orientation and the moderating effect of market turbulence on this mediation path.

3.3 Research Hypotheses

Based on the above theoretical model, we propose the following research hypotheses:

H1: Generative AI capability positively influences SMEs' entrepreneurial

orientation ($\beta_1 > 0$).

H2: Entrepreneurial orientation positively influences SMEs' entrepreneurial resilience ($\beta_2 > 0$).

H3: Generative AI capability positively influences SMEs' entrepreneurial resilience ($\beta_3 > 0$).

H4: Entrepreneurial orientation mediates between generative AI capability and entrepreneurial resilience ($\beta_1 \times \beta_2 > 0$).

H5: Market turbulence positively moderates the influence of entrepreneurial orientation on entrepreneurial resilience ($\beta_6 > 0$), meaning that under high market turbulence conditions, the positive influence of entrepreneurial orientation on entrepreneurial resilience is stronger.

3.4 Data Collection Method

The study employs a survey method to collect empirical data from Taiwanese SMEs. The research subjects are SMEs as defined by the Small and Medium Enterprise and Startup Administration, Ministry of Economic Affairs, namely enterprises with fewer than 200 employees. We will prioritize firms that have adopted or plan to adopt generative AI tools to ensure the practical relevance and data quality of the research.

The survey design includes measurement scales for four main constructs: generative AI capability, entrepreneurial orientation, entrepreneurial resilience, and market turbulence. All scales are adapted from validated measurement instruments in existing literature and employ a seven-point Likert scale to ensure measurement precision and variability. The survey will undergo pilot testing and expert review to ensure content validity and face validity.

3.5 Measurement Instruments

1. Generative AI Capability (X): We operationalize generative AI capability into three sub-dimensions: human skills, technological infrastructure, and data-driven culture. Measurement items assess the firm's investment level and capability in these three aspects.
2. Entrepreneurial Orientation (M): The measurement of entrepreneurial orientation covers five dimensions: risk-taking, innovativeness, proactiveness, competitive aggressiveness, and autonomy. Measurement items assess the firm's strategic posture and behavioral performance in these aspects.
3. Entrepreneurial Resilience (Y): The measurement of entrepreneurial resilience focuses on the firm's adaptive capacity, recovery capacity, and learning

capacity when facing crises. Measurement items assess the firm's responsive performance and sustainability under market uncertainty.

4. Market Turbulence(W): The measurement of market turbulence evaluates the degree of change in the firm's external environment, including market demand fluctuations, competitive intensity changes, and technological change velocity.

3.6 Data Analysis Methods

The study employs Structural Equation Modeling(SEM) using AMOS software to test the research hypotheses. SEM allows for the simultaneous examination of measurement models and structural models, enabling a comprehensive assessment of relationships among multiple constructs. To ensure measurement quality, we will conduct reliability analysis(Cronbach's alpha), convergent validity analysis (average variance extracted: AVE), and discriminant validity analysis. For hypothesis testing, we will examine path coefficients and their significance levels, with mediation effects tested using the bootstrap method.

4. Research Results

4.1 Sample Description

The study collected questionnaire data from 350 valid Taiwanese SME samples. Regarding industry distribution, manufacturing accounts for 28.6%, services for 35.4%, technology for 22.3%, and other industries for 13.7%. By firm size, micro-enterprises(fewer than 10 employees) represent 15.4%, small enterprises(10-49 employees)42.3%, and medium enterprises(50-199 employees) 42.3%. By establishment years, firms established less than 5 years account for 18.9%, 5-10 years for 31.4%, 11-20 years for 28.6%, and over 20 years for 21.1%. This diverse sample distribution ensures broad representativeness and generalizability of research findings.

4.2 Reliability and Validity Analysis

Table 1 presents the reliability and validity analysis results for all constructs. Cronbach's alpha values for all constructs exceed 0.85, indicating good internal consistency. Composite reliability(CR) values all exceed 0.87, further confirming construct reliability. Average variance extracted(AVE) values all exceed the threshold of 0.50, ranging from 0.612 to 0.687, demonstrating good convergent validity. These results indicate that our measurement instruments possess

satisfactory psychometric properties.

Table 1 Reliability and validity analysis

Construct	Cronbach's α	CR	AVE
Generative AI capability	0.912	0.925	0.687
Entrepreneurial orientation	0.887	0.901	0.645
Entrepreneurial resilience	0.856	0.873	0.612
Market turbulence	0.892	0.908	0.658

4.3 Hypothesis Testing Results

Table 2 presents the hypothesis testing results. Structural equation modeling analysis reveals that generative AI capability significantly and positively influences entrepreneurial orientation ($\beta_1 = 0.687, p < 0.001$), supporting hypothesis H1. This result validates that generative AI technology, as a lower-order dynamic capability, effectively enhances firms' decision-making agility and strategic adjustment capacity.

Entrepreneurial orientation demonstrates significant positive effects on entrepreneurial resilience ($\beta_2 = 0.542, p < 0.001$) supporting hypothesis H2. This finding confirms that firms with high entrepreneurial orientation exhibit stronger adaptive and recovery capabilities when facing crises.

The direct effect of generative AI capability on entrepreneurial resilience also reaches statistical significance ($\beta_3 = 0.256, p < 0.001$), supporting hypothesis H3. This finding indicates that generative AI not only indirectly influences entrepreneurial resilience through entrepreneurial orientation but also directly strengthens firms' crisis response capabilities.

Mediation analysis results show that entrepreneurial orientation plays a partial mediating role between generative AI capability and entrepreneurial resilience (indirect effect = 0.372, $CI = [0.2982, 0.451]$), supporting hypothesis H4. This result indicates that generative AI enhances entrepreneurial resilience by improving entrepreneurial orientation.

Regarding the moderation test, market turbulence significantly and positively moderates the influence of entrepreneurial orientation on entrepreneurial resilience ($\beta_6 = 0.183, p < 0.01$), supporting hypothesis H5. This finding indicates that under high market turbulence conditions, the positive influence of entrepreneurial orientation on entrepreneurial resilience is more pronounced, validating generative AI's unique value in uncertain environments.

Table 2 Hypothesis testing results

Hypothesis	Path	Standardized coefficient	t-value	Result
H1	Generative AI → EO	0.687***	14.523	Supported
H2	EO → ER	0.542***	11.876	Supported
H3	Generative AI → ER	0.256***	5.432	Supported
H4	Generative AI → EO → ER	0.372***	---	Supported
H5	EO × MT → ER	0.183**	3.254	Supported

Note: ** $p < 0.01$; *** $p < 0.001$. EO = Entrepreneurial Orientation; ER = Entrepreneurial Resilience; MT = Market Turbulence

4.4 Generative AI Application Benefits Analysis

The study further analyzes the performance benefits of generative AI across different application dimensions. Table 3 presents respondent firms' benefit assessments of generative AI in market analysis, decision optimization, marketing content production, customer relationship management, and operational efficiency enhancement. Overall, respondent firms maintain positive evaluations of generative AI application benefits, with average scores ranging from 4.82 to 5.67 (on a seven-point scale).

In market analysis and forecasting, generative AI demonstrates the highest benefit evaluation ($M = 5.67, SD = 0.89$), validating this technology's unique value in assisting SMEs to optimize market intelligence analysis and forecasting models. Decision optimization and resource allocation benefits rank second ($M = 5.43, SD = 0.95$), reflecting that generative AI indeed enhances firms' decision-making agility and strategic adjustment capabilities. Marketing content production and creative output ($M = 5.29, SD = 1.02$), customer relationship management and personalization services ($M = 5.18, SD = 1.08$), and operational efficiency enhancement and cost savings ($M = 4.82, SD = 1.15$) all achieve moderately high benefit evaluations, indicating that generative AI creates substantial value across multiple business functional domains.

Table 3 Generative AI application benefits assessment

Application dimension	Mean	SD
Market analysis and forecasting	5.67	0.89
Decision optimization and resource allocation	5.43	0.95
Marketing content production and creative output	5.29	1.02
Customer relationship management and personalization	5.18	1.08
Operational efficiency enhancement and cost savings	4.82	1.15

Note: Seven-point Likert scale (1 = Strongly disagree, 7 = Strongly agree)

5 Conclusions and Recommendations

The study empirically validates five core findings regarding generative AI's impact on Taiwanese SMEs' entrepreneurial model transformation. First, generative AI capability significantly enhances entrepreneurial orientation, confirming that this technology, as a lower-order dynamic capability, effectively strengthens firms' decision-making agility and strategic adjustment capacity. Second, entrepreneurial orientation has a significant positive impact on entrepreneurial resilience, confirming that firms with high entrepreneurial orientation demonstrate stronger adaptive and recovery capabilities during crises. Third, generative AI capability directly enhances entrepreneurial resilience, highlighting its unique value in crisis management. Fourth, entrepreneurial orientation plays a partial mediating role between generative AI capability and entrepreneurial resilience, revealing the critical path through which technology transforms into organizational capability. Fifth, market turbulence significantly moderates the influence of entrepreneurial orientation on entrepreneurial resilience, validating generative AI's strategic value in highly uncertain environments. Additionally, the research finds that generative AI creates substantial benefits in market analysis, decision optimization, and marketing strategy, though application effectiveness varies by firm size, industry characteristics, and establishment years.

The study makes four main theoretical contributions. First, we construct an integrated framework combining dynamic capability theory and entrepreneurial orientation theory. Through testing mediation and moderation effects, we systematically elucidate the complex relationships among generative AI technology, entrepreneurial orientation, market turbulence, and entrepreneurial resilience, providing a complete mechanism for understanding how emerging technologies influence organizational resilience. Second, we conceptualize generative AI as a lower-order dynamic capability and empirically validate its supporting role for higher-order dynamic capabilities, deepening dynamic capability theory application and filling gaps in existing literature.

Third, we confirm the moderating effect of market turbulence, enriching the application of contingency theory in entrepreneurship research and clarifying how external environments influence internal capability effectiveness. Simultaneously, we extend generative AI research to the context of Taiwanese SMEs, validating Western theories' applicability in Eastern cultural contexts and providing an empirical foundation for cross-cultural entrepreneurship research. Fourth, we develop and validate measurement scales with good psychometric properties, providing reliable instruments for subsequent research and promoting the deepening development of generative AI in the entrepreneurship research

domain.

The study has three main limitations. First, the cross-sectional research design limits causal inference capability and cannot fully capture the dynamic processes and long-term impacts of generative AI adoption. Future research should employ longitudinal designs to track changes in firms at different time points. Second, the research scope focuses on entrepreneurial decision-making and marketing strategy, limiting the breadth of research findings. Future research could expand to other functional domains such as human resource management and supply chain management. Third, the sample is limited to Taiwanese SMEs, and cross-cultural inferences from research findings should be approached cautiously. We recommend conducting cross-national comparative research to test the theory's universality.

Based on our findings and limitations, we propose three future research directions. First, employ longitudinal research designs to track dynamic changes during firms' generative AI adoption processes. Through multi-wave data collection, clarify the causal mechanisms of technology learning curves, capability construction processes, and long-term performance impacts. Second, expand to cross-cultural and cross-national comparative research, examining how contextual factors such as cultural dimensions, institutional environments, and technological infrastructure moderate generative AI's impact on firm transformation, identifying key elements influencing technology diffusion. Third, focus on generative AI's impact on organizational structure, work design, and human capital. As generative AI gradually assumes knowledge-intensive tasks, organizational power structures, work content, and talent requirements will undergo fundamental transformations. Research should explore how generative AI reshapes organizational boundaries, changes the nature of work, and how enterprises should redesign jobs and cultivate new types of human capital to adapt to AI-driven work environments. Additionally, in-depth exploration of ethical issues and social impacts of generative AI application is needed, including data privacy, algorithmic bias, and job displacement concerns.

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