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The Role of Digital Transformation, Corporate Culture, and Leadership in Enhancing Corporate Sustainable Performance in the Manufacturing Sector of China

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Abstract: The Chinese manufacturing industry faces many challenges to sustainable development. This study examines how transformational leadership, corporate culture, and digital transformation affect Chinese manufacturing organizations' sustainability. It will also examine the moderating role of environmental dynamism and the mediating effect of innovation capabilities. A self-administered survey was distributed to 350 manufacturing companies' owners, managers, leaders, and employees, etc. Participants were selected via convenient sampling. This data collection effort validated findings and empirically tested theories. Smart PLS structural equation modelling (PLS-SEM), quantitative research, and cross-research are used in this study. The findings suggest that corporate culture, transformational leadership, and digital transformation significantly affect organizations' sustainability. Innovation capability does not affect the relationship between corporate culture and sustainability. However, it mediates the relationship between transformational leadership, digital transformation, and business sustainability. Innovation capabilities and business sustainability performance are moderated by environmental dynamism. This study contributes to sustainable corporate performance theory by showing managers how transformational leadership, digital transformation, and corporate culture can help manufacturing companies grow indefinitely. The findings have major implications for China, a highly industrialized nation. This study could benefit regulatory authorities, academic institutions, industry, government agencies, and researchers.

Keywords: corporate culture; digital transformation; transformational leadership; corporate sustainable performance

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1. Introduction

The industrial sector is facing a significant challenge regarding achieving sustainable development [1]. The industrial sector plays a pivotal role in fostering economic growth, promoting competitiveness in the market, generating employment opportunities, and addressing income inequality [2,3]. Numerous businesses in this sector have been compelled to close due to the COVID-19 pandemic, which has intensified the strain on these sectors. Ensuring the survival of the manufacturing sector necessitates its expansion and growth, which can be achieved through sustainable development [4]. As a result, businesses will inevitably confront the issue of achieving sustainable development [5]. The concept of corporate sustainability pertains to an organization's capacity to fulfill its stakeholders' expectations while concurrently advancing and maintaining development throughout its existence [6]. Researchers have suggested several factors that may contribute to sustainable performance, such as organizations [7], technology [8], intellectual property [9], human resource management [10], knowledge sharing [11], lean procedures [12], corporate culture [13], and others. These factors' significant impact on sustained efficiency justifies their elevated designation as critical performance indicators.

Industry 4.0 has led to an increase in the prevalence of digitalization. Digitalization, driven by digital technology, propels the economy and society into the digital era [14]. Many countries prioritize digital transformation as a strategic approach to gaining a competitive edge and achieving sustainable economic advantages [15]. "Digital transformation" is influencing and shaping organizational change through digital technologies [16]. An increasing number of organizations are turning to digital technologies such as the Internet of Things (IoT), artificial intelligence (AI), and big data analytics to tackle the challenges posed by a global marketplace, evolving consumer demands, emerging regulations, and talent scarcity [17]. Business executives and researchers are eagerly seeking to use the promise of these technologies, while governments are competing to incorporate them into their agendas [18,19]. Sustainability is a key priority for businesses. Companies prioritize the establishment of a durable competitive edge in a volatile and uncertain market, particularly considering the several global obstacles they encounter, like the COVID-19 pandemic, energy and climate emergencies, political instability, and significant stakeholder concerns [20,21].

China is highly compatible with research on digitization. China, the second-largest economy and the largest population in the world has made notable advancements in digital technology. The proliferation of digital technology has led to the establishment of the digital economy, which presently assumes a critical position in China's ongoing economic evolution and expansion. Predictions place the digital economy's value at CNY 50.2 trillion in 2022, positioning it as the second-most substantial sector globally. It is anticipated to contribute approximately 41.5% to China's GDP [22].

In recent decades, there has been a clear change in research examining organizational commitments' influence on enhanced performance [23]. However, there is an increasing amount of studies in the field of management literature that regard CSR as a dedication made by a firm [24,25]. Consequently, firms across all industries have begun implementing these tactics to enhance their reputation and efficiency and reduce conflicts with important stakeholders [26].

Leadership style is a crucial component that significantly impacts a company's effectiveness, among other factors. In addition, the competitive landscape is influenced by corporate policies, which are determined by leadership decisions [27]. An organization faces multiple challenges in a fiercely competitive environment. For a corporation, the primary objective is to outperform its competitors, and the most effective approach to achieving this is enhancing operational performance [28].

After reviewing the existing literature on the subject matter, researchers have identified several deficiencies in our understanding of sustainable performance, digital transformation, transformational leadership, and corporate culture. Before commencing, it is imperative to establish a greater level of uniformity in research about the impact of corporate culture on sustained prosperity [29]. According to Liu, Wan, and Yu [30], corporate culture hinders reform initiatives in firms since sustainable growth requires introducing new ideas and changes in company culture. Multiple research studies [31–33] have provided evidence that implementing the corporate culture can facilitate and enhance sustainable development. The gap here may stem from the fact that different forms of business culture have diverse effects on sustainable development. As a result, academic investigations concerning the correlation between sustainable performance and corporate culture would be enhanced by a concentration on collecting more precise data about the elements of corporate culture that foster enduring success.

Our research needs to be improved due to the absence of well-defined boundary conditions and a comprehensive comprehension of the fundamental mechanism via which corporate cultures influence sustainable performance. The existing literature needs sufficiently detailed advice for firms to effectively execute cultural changes that enhance sustainable performance [34–36]. Studies have demonstrated that culture can influence performance, while the specific methods for implementing this connection are still being established. The environment in which an organization functions substantially influences

its culture, which is inherent to the business. Instead of only focusing on culture, it is essential to accurately analyze how culture interacts with other operational-related factors to forecast its role [37].

Limited knowledge exists regarding the potential for companies to improve their long-term success by cultivating their company culture [38,39]. Qualitative investigations constitute the predominant body of research concerning the correlation between corporate culture and sustainable performance [40,41]. It is deficient in empirical evidence to support its findings [42]. Hence, there is still potential for enhancing the applicability of these findings.

Research investigations have examined how digital transformation impacts diverse aspects of enterprises, such as organizational structure, resilience, performance, innovation, and industrial structure upgrades. The ultimate objective is to optimize company models and production processes while ensuring the most effective allocation of resources [43]. Digitization enhances organizational resilience, creativity, and the achievement of sustainable development goals. It also improves business, functioning, and environmental performance. However, no definitive evidence exists to establish a direct correlation between digital transformation and sustainability [44,45]. Few studies have been conducted on strategic leadership, with most empirical studies concentrating on executive qualities [46,47]. This research sheds new light on the impact of management teams on facilitating digital transformation, fostering organizational culture, implementing transformational leadership, and ensuring long-term sustainability.

To address these areas of limited understanding, the researchers delved deeper into the resource-based view [48]. They developed a framework that examines the interplay of innovation capabilities, digital transformation, company culture, and transformational leadership. We also consider the moderating impact of environmental dynamism on this association.

This enables an assessment of the influence of different leadership styles on the ability to innovate, along with the potential ways in which transformational leadership, corporate culture, and digital transformation can either support or hinder long-term success [49]. By demonstrating the possible effects of business culture, digital transformation, and transformational leadership on sustainable performance, this research makes a valuable contribution to the existing body of theoretical literature on corporate sustainable performance. Furthermore, it discerns the mechanisms and boundary circumstances that might regulate this association. The findings also illuminate how organizations employ corporate culture to maintain financial stability and promote long-term growth.

The findings of this study will contribute to the body of management literature and pave the way for further investigations with wider applicability [50]. This study clarifies the potential for environmental and social leaders in government and business to support the sustainability efforts of their respective organizations by illustrating how digital transformation can significantly enhance sustainability.

The main objective of this research is to determine the impacts of digital transformation, corporate culture, and transformational leadership on the sustainable performance of manufacturing companies in China, with the mediating effects of innovation capability and environmental dynamism anticipated to have a moderating influence.

- What is the impact of digital transformation, corporate culture, and transformational leadership on the sustainability performance of Chinese manufacturing companies?
- How does the ability to innovate affect the connection between digital transformation, corporate culture, transformational leadership, and sustainable performance in China's manufacturing sector?
- Does the level of environmental dynamism have a moderating impact on the relationship between a company's ability to innovate and its sustainable performance in China's manufacturing sector?

2. Literature Review

The resource-based view significantly improves the comprehension and prediction of a business's competitive advantage and financial performance. It asserts that differences in organizational performance stem from the diversity of resources within firms, and it emphasizes the internal variables that give rise to a sustained competitive edge [51]. Enterprises develop a competitive advantage in the RBV [52] by utilizing a distinct combination and use of valuable, rare, difficult-to-imitate, and non-replaceable resources. Helfat et al. [53] defined resources as anything that can be considered a benefit or drawback of a specific company. A firm's resources include all the assets, competencies, organizational procedures, attributes, data, expertise, etc., that the corporation controls and uses to develop and implement strategies that increase efficiency [54]. Scholars [55–57] have identified transformational leadership, digital transformation, and corporate culture as essential elements of enterprise resources. This study aims to understand better how digital transformation, transformational leadership, and corporate culture interact within the resource-based paradigm to help manufacturing organizations gain a competitive edge.

2.1. Corporate Sustainable Performance and Corporate Culture

Wang and Huang [58] believe that organizational culture is a determinant of both individual behavior and team performance inside an organization. An organization's strong culture is characterized by the widespread adoption of shared views and values, which are actively pushed by the company's leaders [59]. Corporate sustainability refers to the set of leadership and management principles an organization implements to attain social, environmental, and economic objectives concurrently [60,61]. A correlation has been observed between an organization's culture and its sustained success, as indicated by the findings of Moslehpour [62], which suggests that an effective organizational culture contributes to improved performance. According to [63], an organization's culture could potentially be a source of long-term financial success and competitive advantage.

A study by Shaukat and Ming [64] investigated the correlation between a solid corporate culture and the unpredictable nature of business outcomes. Cheng, Hua, and Wang [65] argue that a robust corporate culture with clearly defined goals and processes facilitates the smooth execution of internal administrative operations. A study conducted by Cheng, Hua, and Wang [66] discovered a direct relationship between company performance and organizational culture. A positive link was observed between (a) the effectiveness and the performance of the company, (b) the alignment of the mission, consistency, and revenue, and (c) the adaptability, mission, and growth in sales. Participation, consistency, adaptability, and purpose are some factors that [67,68] found to impact organizations' performance. These aspects are interconnected with the processes of developing products, increasing sales, and maintaining quality, ultimately affecting the financial performance of companies. Refs. [69–72] agreed that organizational culture significantly influences performance enhancement. Results based on previous research show different findings in different contexts, and very few studies have been conducted in the context of the manufacturing sector, specifically in the context of China. Therefore, the present study aims to examine the impact of corporate culture on sustainable corporate performance in China's manufacturing sector. To achieve this objective, the following hypotheses will be tested.

Hypothesis 1 (H1). *Corporate sustainable performance is positively affected by organizational culture.*

2.2. Corporate Sustainable Performance and Digital Transformation

According to Xu, Chen, and Dai [73] and Chen and Kim [74], resource-based theory posits that organizations can achieve a competitive edge and exceptional performance by leveraging scarce, valuable, and difficult-to-replicate resources. Due to the exponential growth of digital technology, numerous enterprises have recognized the criticality of digital resources in supporting their manufacturing operations. These assets generate a sustainable competitive advantage due to their scarcity, distinctiveness, and acquisition challenges. In

addition, digital transformation facilitates businesses in improving their environmental impact, optimizing resource utilization, and advocating for a circular economy that is more environmentally friendly. Initially, organizations can implement ecologically conscious protocols utilizing digital technology, reducing their environmental impact and other superfluous emissions [75].

Using the difference-in-differences (DID) method, the author Zhao [76] utilized China's low-carbon city pilot (LCCP) as a sort of natural experiment to examine the effect on the digital transformation of manufacturing companies. The findings revealed that the LCCP has effectively supported the digital transformation of manufacturing companies located in pilot locations. This has significantly influenced the diversity of businesses, industries, and regions. The LCCP has substantially influenced the advancement of digital transformation within financially developed regions, state-owned enterprises (SOEs), and corporations operating in high-carbon sectors.

As an experiment, the research investigates the impact of the 5G Technology Pilot Construction program in China in 2018 on the efficiency of technological innovation within manufacturing companies [77]. Research indicates that the promotion of 5G technology can significantly increase manufacturing firms' technological innovation output. The impact of endorsing 5G technology on the efficacy of technological innovation is more pronounced for manufacturing companies in urban areas with sophisticated digital finance abilities and comparatively lower levels of technological proficiency.

Yang and Han [78] conducted a study to examine the potential of digital transformation to reduce carbon emissions through enhancements in governance, environmental information disclosure, and technological progress. Furthermore, the digitization of industrial processes enhances energy and material efficiency, reducing overall energy consumption [79]. Moreover, this development promotes the extensive integration of renewable energy sources in developing nations like China. Ultimately, firms can enhance their sustained social, economic, and environmental development by leveraging digital technology to generate distinctive manufacturing processes and gain a competitive edge through continuous innovation [75]. The above discussion shows mixed and different findings in different contexts on the relationship between digital transformation and corporate sustainable performance. Rare studies have been conducted in the context of the manufacturing sector, so the results of previous empirical studies require further study in China's manufacturing sector. Therefore, this hypothesis is postulated based on the last analysis.

Hypothesis 2 (H2). *The implementation of digital transformation has a beneficial influence on the sustainable development of companies*.

2.3. Corporate Sustainable Performance and Transformational Leadership

As defined by Widisatria and Nawangsari [80], leadership is an executive position that gives an individual the authority to influence individuals within an organization. The importance of leadership and its potential for development at any organizational level was affirmed by Purwaningsih, Tarto, and Candraningsih [81]. Furthermore, leadership is not contingent upon a certain job designation; instead, it is a phenomenon that multiple individuals may experience at different stages within an organization's operations [82].

Corporate sustainability refers to the leadership and management principles a company implements to effectively pursue its environmentally friendly, social, and economic objectives simultaneously [83]. As per the findings of Wang and Huang [58], it is imperative for corporate executives to effectively persuade all stakeholders, including themselves and the community, to pursue a more capable future for the company to safeguard its interests. The growing emphasis in the corporate environment on the association between corporate sustainability and commercial success is driven by stakeholders' strong interest in the organization's ethical culture [84]. The findings based on preceding studies show diverse findings using different variables, and very rare studies have been conducted on these

variables. Therefore, there is a need to study the impact of transformational leadership on sustainable corporate performance in China's manufacturing sector. Thus, the following hypothesis is suggested:

Hypothesis 3 (H3). *Corporate sustainability is significantly impacted by transformational leadership.*

2.4. Mediating Role of Innovation Capabilities

Al Taweel and Al-Hawary [85] define innovation in manufacturing as the dominant and widely adopted technological influences that have significantly impacted the sector throughout its history. Businesses that adopt intelligent technology have increased customer achievement, contentment with environmental and social activities, and value generation through implementation [86]. Companies can secure long-term sustainability by implementing creative strategies prioritizing fundamental principles [87]. In addition, Husban, Almarshad, and Altahrawi [88] emphasized that innovation is crucial for attaining sustainability. However, Dixit, Jakhar, and Kumar [89] and Hwang, Choi, and Shin [90] were among the few researchers who did not consider the significance of innovative performance as a mediator between competitive advantages.

According to an alternative perspective held by scholars, the value of digitalization diminishes if creative methods remain stagnant for a long time [91–93]. Industry 4.0 presents difficulties in various domains, such as sustainability, human resource management, performance, operations, supply chain practices, business prospects, and quality management principles [94–96]. Ferreira, Cardim, and Coelho [95] argue that innovation is essential for enterprises of all sizes to remain competitive in organizational sustainability. According to Liu, Chang, and Fang [96] and Molden and Clausen [97], equitable growth can be attained through the strategic utilization of industrial technologies that improve an organization's capacity for innovation in product, process, and administration. China excels in manufacturing and exporting goods by leveraging smart technology to enhance its innovation capabilities [98].

By incorporating mediation into a theoretical framework, it becomes possible to examine the mechanism through which the impact of an independent variable is transmitted to the dependent variable [99]. The present study investigates the mediating role of corporate culture in the relationship between transformational leadership, digital transformation, inventive performance, and organizational sustainability. The collaborative implementation of quality management approaches in the manufacturing sector minimizes the influence of leadership and enhances creative performance [100]. According to Pundziene, Nikou, and Bouwman [101], organizational innovation is essential to maximize the impact of an entrepreneurial mindset on company performance. Sarfraz, Ivascu, et al. [102] did not include innovation as a mediator between a business's economic sustainability and the simultaneous influence of social and environmental elements. Constraints regarding the findings prompted the researchers to re-examine the impacts of creative performance. Previous research shows mixed and inconsistent results between variables, and the mediating role of innovative capabilities between this study's variables has not been studied. Based on the above arguments, the study presents the following hypotheses:

Hypothesis 4 (H4). *The impact of transformational leadership and organizational sustainability is mediated by innovative capabilities.*

Hypothesis 5 (H5). *The impact of digital transformation and organizational sustainability is mediated by innovative capabilities.*

Hypothesis 6 (H6). *The impact of corporate culture and organizational sustainability is mediated by innovative capabilities.*

2.4.1. Corporate Culture and Innovation Capabilities

Although resources are important, they alone cannot ensure success for a firm. On the other hand, the success of an organization can be attributed to its culture [103]. Corporate culture may not always meet all VRIN characteristics [58]; thus, it cannot immediately confer a competitive advantage to an organization [104]. According to field experts, in this scenario, a firm's resources can only serve as a durable competitive advantage if they are effectively combined with other corporate capabilities, resources, or business activities [105–107]. Furthermore, the existence of intermediaries is essential for fostering the growth of sustainable performance within the context of corporate culture. The capacity for innovation was selected as an intermediary due to its critical importance in ensuring the industrial sector's survival [107].

The research's null hypothesis posits that culture has a beneficial impact on innovative capabilities. Research has shown that this type of culture is strongly linked to an innovation culture [108–110], which, in turn, enhances creative ability [110]. In addition, a culture that encourages openness, creativity, risk-taking, and entrepreneurial spirit motivates employees to act in a way that prioritizes innovation as a core business concept [111]. Promoting a mindset that encourages thinking outside conventional boundaries would enhance long-term innovation capacity [112]. Organizations that prioritize flexibility typically adopt a natural framework [113], which has been demonstrated to improve their ability to innovate [114]. An organization's capacity for innovation may be strengthened by its emphasis on fostering a culture of flexibility. Such cultures foster an environment that promotes employee autonomy, engagement, and reciprocal knowledge acquisition [115]. Based on the above discussion, the findings of the previous studies were confusing, so there is a need to identify the relationship between corporate culture and innovation capabilities in the context of the manufacturing sector. Thus, the entirety of the research posits the subsequent hypothesis:

Hypothesis 7 (H7). *The relationship between corporate culture and innovation capabilities is significant*.

2.4.2. Digital Transformation and Innovation Capabilities

To effectively adapt to digital transformation, businesses need to make significant changes to their operations, work practices, and interactions with stakeholders in the supply chain and related industries [116–118]. Hence, digitalization can be regarded as a crucial enabler of flexible competencies that can identify changes, seize opportunities, and transform companies [118].

The present body of literature has enhanced the relationship between digitization and creative abilities through a comprehensive examination and assessment of prior research [119–121]. Consistent with the findings of [121], the present study suggests that digitalization initiatives may improve and maintain an organization's innovation performance. Organizations that wish to innovate in response to the opportunities and challenges presented by new technologies must have a profound understanding of how digitalization affects innovation capabilities [122]. Based on the above discussion about previous studies' results, the researchers are conducting this research to provide clearer results regarding the relationship between digital transformation and innovation capabilities. Therefore, the research hypothesis might be expressed as:

Hypothesis 8 (H8). *The relationship between digital transformation and innovation capabilities is significant*.

2.4.3. Transformational Leadership and Innovation Capabilities

To attain success at the organizational level, organizations must possess the ability to innovate. Innovation encompasses the aptitude to recognize and execute innovative ideas, products, services, methodologies, technologies, organizational frameworks, approaches, and initiatives [123]. Leaders who cultivate a conducive and supportive atmo-

sphere for creativity directly influence the process of innovation [124]. Based on a previous study conducted by Gui, Lei, and Le [125], transformational leadership motivates employees to prioritize the firm's objectives over their interests, resulting in a continuous cycle of innovation.

Scholars [119,126–128] have identified four distinct criteria that define transformative leaders: (1) Idealized influence encompasses a transformative leader's ability to inspire a sense of pride, articulate a clear mission vision, and gain the respect and trust of their people. (2) The ability of a transformational leader to inspire individuals to think critically and solve complex problems shows that they can stimulate their intellectual capacities. A transformational leader who places a premium on the sharing and distributing information with outstanding standards has an inspirational drive. They use symbols to concentrate efforts and employ straightforward approaches to communicate significant objectives or aims effectively. (3) Individualized consideration demonstrates that a transformative leader is genuinely concerned about fulfilling the requirements of their staff, providing guidance and counsel, and treating each individual with personalized attention. Theng et al. [120] found that transformational leadership significantly influences the creation of a suitable atmosphere for business creativity. To better understand this influence, this study will examine two aspects: idealized influence and customized attention. Evidence suggests that transformational leadership is a solid predictor of an organization's capacity to generate novel ideas; however, further investigation is required to ascertain the precise and transparent influence of various personality traits on these outcomes [128]. Based on this discussion about previous studies, the findings were mixed and inconsistent, so there is a need to clarify the relationship between transformational leadership and innovation capabilities in the context of the manufacturing sector. Thus, as per the above findings, the hypothesis of the study will be:

Hypothesis 9 (H9). *The relationship between transformational leadership and innovation capabilities is significant*.

2.4.4. Corporate Sustainable Performance and Innovation Capabilities

According to the resource-based view—RBV—an organization's capacity to innovate is crucial since it enables them to accomplish their creative goals [129–131] and stimulate growth, performance, and a competitive edge [131]. The NBRV highlights that a company's environmental relationship is its area of excellence [132]. Consequently, corporations are placing a growing emphasis on achieving sustainable development. Studies have indicated that innovation is crucial in this phenomenon [133]. Innovation is more important than ever for a company's long-term success in the current hostile business environment [134]. Businesses contemplate sustainable development initiatives as a potential strategy to gain a competitive edge in the marketplace [135]. Therefore, forward-thinking companies will actively seek sustainable development to retain a superior position in the market [136]. The study is theoretically based on this.

Our research indicates that a company's long-term performance is substantially influenced by its capacity for innovation, encompassing both technological and managerial fields. Technological innovation is an area where strong skills truly excel. Proficient companies effortlessly enhance their market share, generate greater profits, and contribute to a more sustainable economy [137] by continuously improving their products' quality, performance, and production methods [138], strengthening their fundamental competitiveness. In contrast, firms may improve their resource efficiency, produce products with minimal pollution and energy consumption, and enhance their sustainable performance by having a strong capacity for technical innovation [139]. In conclusion, the capacity for innovation may ultimately enhance organizations' social, environmental, and economic outcomes. Based on the above discussion, there is a need to provide clearer and more authentic results regarding the relationship between innovation capabilities and corporate sustainable performance. Therefore, the subsequent hypothesis is proposed in this research:

Hypothesis 10 (H10). *The relationship between innovation capabilities and corporate sustainable performance is significant.*

2.5. Moderating Role of Environmental Dynamism

Specific aspects of the business environment significantly impact strategies aimed at affecting the performance of firms [140]. According to Yu et al. [141] and Andrade, Franco, and Mendes [142,143], businesses' innovativeness substantially influences enhancing corporate performance. However, the dynamic nature of the business environment significantly influences this effect. Abusiness's success is contingent upon the reliability and competitiveness of the business environment. The necessity for businesses to generate innovative ideas to ensure their survival and success is underscored by competitive forces [144,145]. Organizations must exhibit resourcefulness and adopt an entrepreneurial orientation to thrive in the volatile business climate.

According to a study by Purwanti, Lailyningsih, and Suyanto [145], organizations with a propensity for innovation tend to fare better in volatile markets. Organizations are compelled to augment their endeavors toward innovation as a reaction to an uncertain commercial landscape. Organizations can attain a competitive edge by successfully satisfying the desires and requirements of consumers through innovative product offerings [146]. Organizations can utilize technological advancements to fulfill consumer expectations and provide superior products. Businesses bolster their competitive edge through consistent innovation, which enables them to increase sales, expand their market share, and guarantee customer satisfaction amidst shifting environmental conditions. Hence, the extent to which an organization lacks awareness of the ecological dynamism environment significantly influences its internal innovation capacities, affecting its long-term performance considerably [147,148].

Both Taghizadeh et al. and Tindika et al. [149,150] concur that the dynamic character of the corporate environment diminishes the impact of product innovation on business success. Divergent viewpoints among scholars exist regarding the influence of environmental dynamism on corporate success and innovation, as evidenced by these types of disagreements. Furthermore, scholars persist in their disagreement regarding the purpose of ecological dynamism [150]. No study has been conducted on the moderating role of environmental dynamism. So, there is a need to examine the relationship between innovativeness and company performance and the moderating effect of environmental dynamism in China's manufacturing sector. Thus, the hypothesis of the study will be:

Hypothesis 11 (H11). *The relationship between innovativeness and company performance is significantly moderated by environmental dynamism.*

3. Research Methodology

3.1. Research Approach

A quantitative research method was employed in this study. The quantitative strategy employed by Mulisa [151] is characterized by a logical approach and a focus on quantifying and interpreting data. The current study followed previous research findings using a quantitative approach to evaluate a hypothesis that aligns with the existing theory. The research conducted by Jansen, Knippels, and van Joolingen [152] revealed a range of investigations, explanations, and descriptive research. The objective of this study was to investigate the correlation between transformational leadership, digital transformation, and organizational culture in the context of business sustainability.

Therefore, this study's primary objective was to provide a comprehensive depiction. This study was cross-sectional in this quantitative research strategy, which collects information from participants at a single time instead of monitoring the passage of time [153–155]. The data were obtained simultaneously through the dissemination of a questionnaire. Bougie and Sekaran [155] state that researchers can efficiently collect data with a survey questionnaire within a reasonable timeframe and at a minimal expense.

3.2. Questionnaire Development

The researchers utilized preexisting research questions that had been thoroughly analyzed to formulate our study topics. As a result, the trustworthiness and dependability of the findings were improved [156].

The survey employed a Likert scale of five points, with 5 indicating strong agreement and 1 representing strong disagreement. Following prior investigations, the participants were requested to assess various products. The questionnaire underwent pilot testing by several management and field experts before initiating the final data collection. The individuals provided favorable feedback regarding the scales' simplicity, grammar, and practicality. The respondents offered valuable insights and recommendations for improving its overall quality after their survey evaluation. Before data collection commenced among the intended participants of the study, the final instrument was modified based on the feedback and suggestions provided by the experimental research participants [157].

Evaluating corporate culture entailed implementing the assessment criteria established by Wuensch et al. and Egholm et al. [158–160]. The Likert scale [160] was implemented to assess transformational leadership. One can evaluate the degree to which a company has accomplished sustainable development by analyzing its ethical conduct. For a firm to ensure its long-term viability, it is crucial to prioritize both social and environmental performance alongside short-term economic rewards [161,162]. The corporate sustainability performance was assessed using Verhelst, Vanhoof, Van Petegem, and Kishore et al. [163, 164]. In line with the methodology employed by Judge and Douglas, we also analyzed environmental dynamism [164,165]. The innovative capability was measured using the scale created by Wahbeh, Sarnikar, El-Gayar, and Bogaert et al. [166,167]. A scale devised by González-Mesa et al. [167] was employed to quantify digital transformation.

3.3. Sampling and Data Collection

The researchers surveyed managers, owners, leaders, and employees of China's industrial sector. The participants were assured that their data would be kept confidential and utilized solely for this study, following research ethics. The data for this study were obtained from participants who were selected using a convenience sampling technique. Furthermore, a total of 350 participants were surveyed for this study.

A sample of respondents can be selected using either probability or non-probability methods [168]. Probability sampling ensures that every individual in the population has an equal chance of being selected. Non-probability sampling, on the other hand, violates this fundamental principle [169]. The researcher must ascertain the demographic of the study's population in this instance. The data were collected using a convenience non-probability sampling procedure, as the survey was conducted online. The researchers requested that participants complete an online survey autonomously to optimize the use of our resources, including time, money, and samples. The technique's efficiency, ease of use, and capacity to encourage respondents' voluntary participation in completing the questionnaire resulted in its selection.

3.4. Data Analysis and Interpretation

Inferential statistics were used in this study to assess the data and accomplish the research aim. The inferential statistics shed light on the nature and magnitude of the correlations between the variables.

Statistical methods called Smart-PLS (partial least squares) were applied to achieve this objective for elucidating the inferential statistics of the model in Partially Least Squares Structural Equation Modeling—PLS-SEM [170]—Smart-PLS is an appropriate technique. An advantageous characteristic of SEM is its adaptability, as it requires a small sample size, a nominal measurement scale, and normal data [171]. In addition, investigators have utilized Partial Least Squares (PLS) to evaluate their models' variables effect [172].

Moreover, when contrasting the complex loadings of alternative methods like LISREL and regression, PLS-SEM exhibits higher efficacy [173] in handling these loadings. Intelli-

gent PLS applies to both informal and reflective evaluation systems. Smart PLS-SEM was utilized in this investigation.

3.5. Conceptual Framework

The conceptual framework of the study is given below in Figure 1:

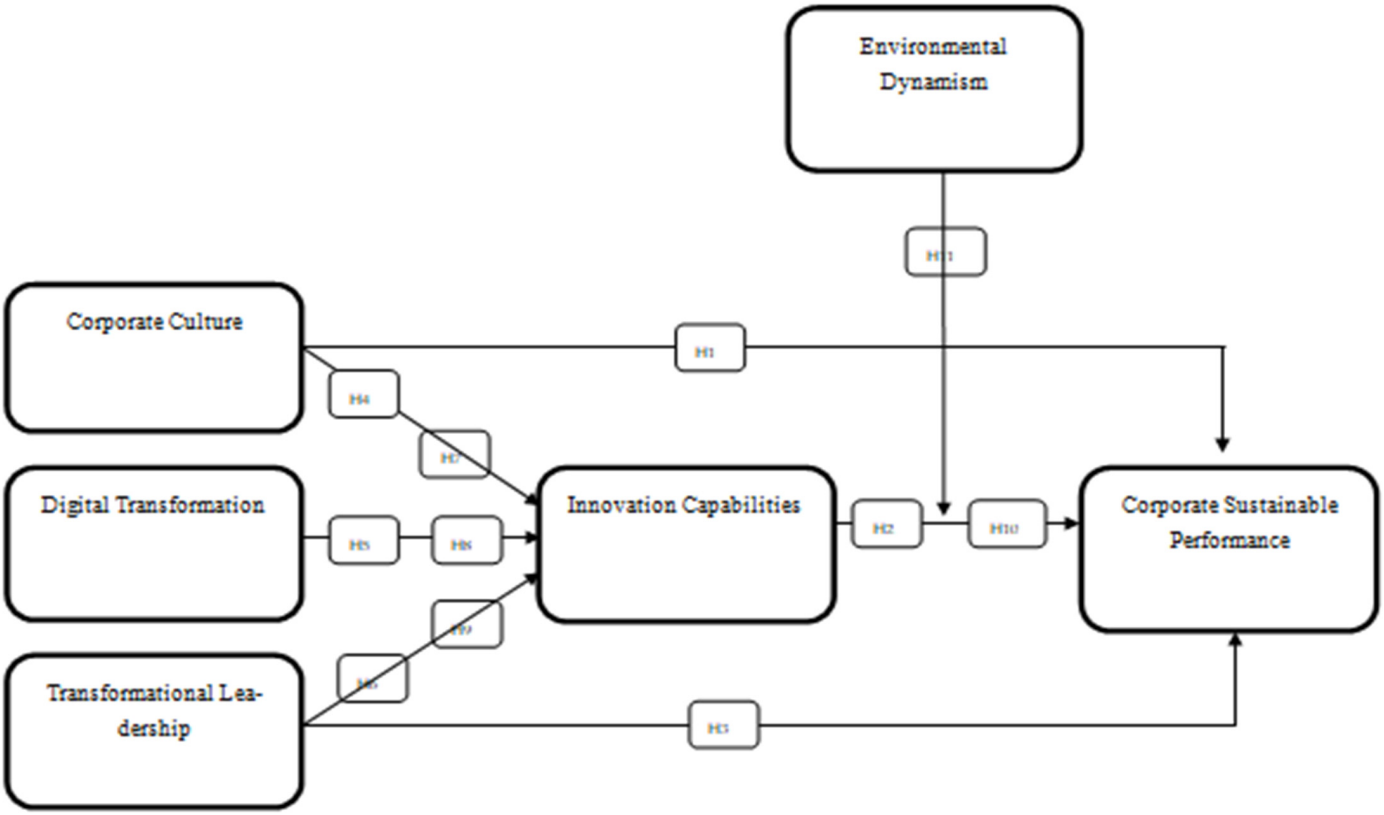

Figure 1. Conceptual Framework. Source: Developed by the researcher.

4. Data Analysis

4.1. Demographic Data

Table 1 shows the participants' demographic characteristics. A total of 350 people completed the survey. According to the study, men constituted 60.6% of the sample size, while women comprised 39.4%. According to the data, men were more involved in corporate performance and transformative leadership efforts than women. Furthermore, older individuals were more confident due to their experience and knowledge. In total, 7.7% of the respondents were between 20 and 30, while the percentages of respondents from 35 to 40, over 40, and 30–35 were39.1%, 40%, and 13.1%, respectively. Advanced education had a substantial impact on both individual and organizational performance. Postgraduates and graduates deeply understood the value of transformative leadership, digital transformation, and organizational performance. The proportions of individuals with bachelor's, master's, and doctoral degrees were29.1%, 57.7%, and 13.1%, respectively. The minimum level of education of the respondents in this survey was a bachelor's degree because the researchers targeted senior and managerial-level employees. Hence, their education had tobe higher, and they had enough work experience due to their designation and knowledge about business studies and relevant fields. In this way, the participants responded better with enough knowledge.

Table 1. Demographic data.

Respondents Description	Frequency	Percentage
Gender		
Male	212	60.6%
Female	138	39.4%
Age of the Respondents		
20–30	27	7.7%
30–35	137	39.1%
35–40	140	40%
40 and above	46	13.1%
Qualification		
Bachelor	102	29.1%
Master	202	57.7%
PhD	46	13.1%
Position		
Manager	97	27.7%
Leader	45	12.9%
Employee	208	59.4%

Source: Survey Data 2024.

Furthermore, 59.4% of participants were classified as permanent employees, 12.9% as leaders, and 27.7% as managers. The target audience was managers, leaders, and senior and permanent employees of the organization. The researchers thought they would be the best choice for the survey because they were more experienced and would give more honest and reliable responses to the study questionnaire than temporary employees because they had spent more time in the organization.

4.2. Convergent Validity

The measurement model of the study depicted in Figure 2 elaborates the main variables of the study.

Convergent validity is a form of validity devoted to determining if various methods of measuring a concept produce the same results [174]. It significantly validates research tools, particularly in psychology and social science [175]. Convergent validity is established by establishing high correlations between different measures of the same construct, along with their inability to measure the same concept [176].

Criteria for Convergent Validity

- Cronbach's Alpha: This internal consistency measure shows the relationship of the set of items as a whole. It varies from 0to 1, with higher values representing stronger internal consistency. Values over 0.7 are usually regarded as acceptable [177].
- Composite Reliability (rho_a and rho_c): This is the measurement of the validity of a latent variable. LikeCronbach's Alpha, it varies from 0 to 1, with higher scores reflecting greater consistency. A value above 0.7 is commonly considered satisfactory [178].
- Average Variance Extracted (AVE): AVE determines how much variance captured by a latent variable from its indicators is due to measurements, as opposed to that due to measurement error. A positive value (0.5 or greater) signifies that the construct accounts for over 50% of the variability observed in its indicators, on average [179].

Corporate Culture (CC):

- Cronbach's Alpha: 0.919, indicating excellent internal consistency.
- Composite Reliability: Both rho_a (0.929) and rho_c (0.936) are well above the 0.7 threshold, indicating a high reliability.
- AVE: 0.677, exceeding the 0.5 threshold, showing that the corporate culture construct accounts for most of the variance in the indicators.

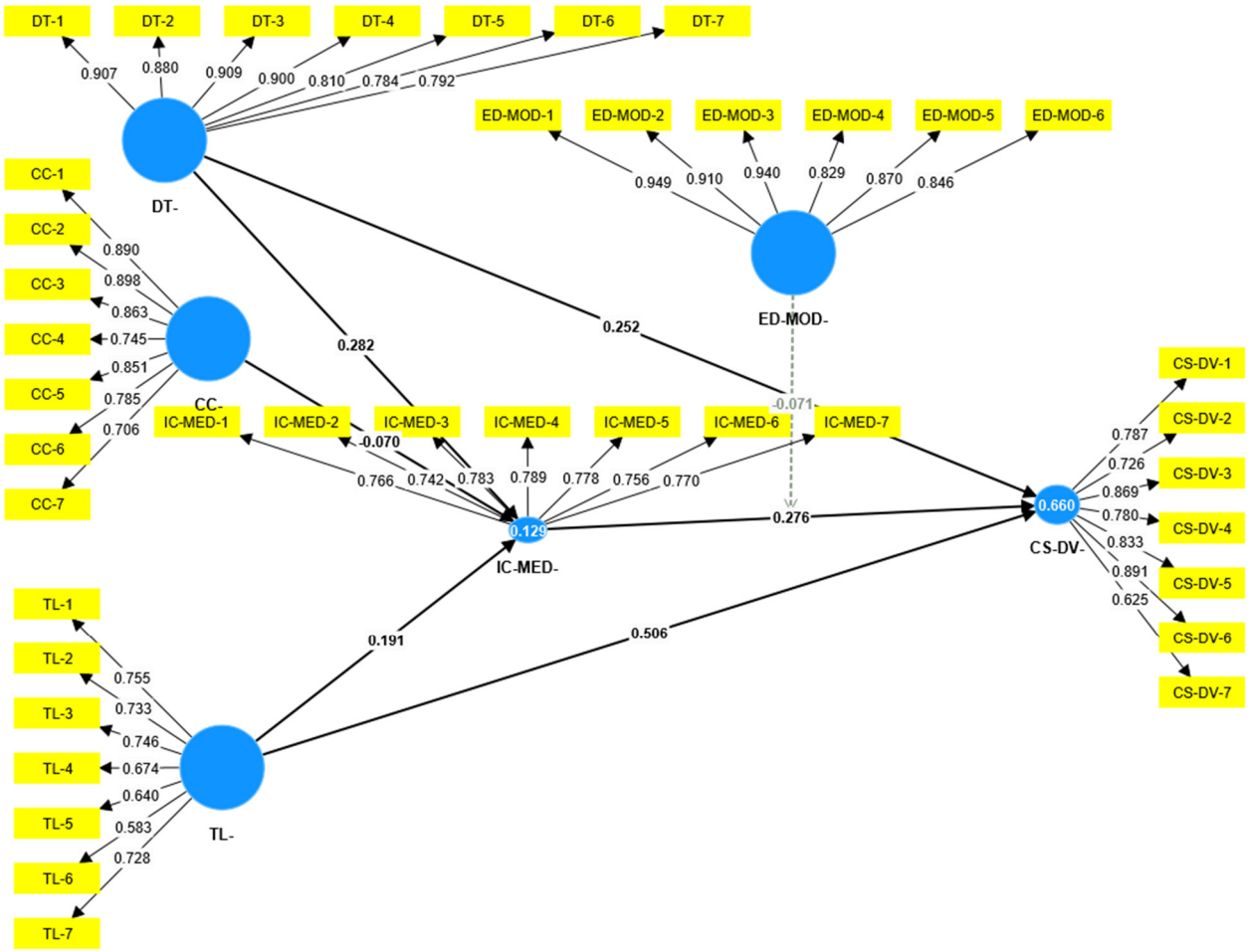

Figure 2. Measurement model. Source: survey data (2024).

Corporate Sustainable Performance (CS-DV):

- Cronbach's Alpha: 0.898, showing a high internal consistency.
- Composite Reliability: Both rho_a (0.902) and rho_c (0.921) are high, indicating reliable measurements.
- AVE: 0.627, above the 0.5 threshold, suggests a good convergent validity.

Digital Transformation (DT):

- Cronbach's Alpha: 0.939, indicating an excellent internal consistency.
- Composite Reliability: Both rho_a (0.949) and rho_c (0.950) are very high.
- AVE: 0.733, well above the threshold, indicating a strong convergent validity.

Environmental Dynamism (ED-MOD):

- Cronbach's Alpha: 0.948, showing a very high internal consistency.
- Composite Reliability: rho_a (0.962) and rho_c (0.959) are exceptionally high.
- AVE: 0.795, indicating that the construct explains a large portion of the variance in the indicators.

Innovation Capabilities (IC-MED):

- Cronbach's Alpha: 0.904, indicating a high internal consistency.
- Composite Reliability: rho_a (0.953) is high, but rho_c (0.910) is slightly lower, yet still acceptable.
- AVE: 0.591, above the threshold, shows good convergent validity.

Transformational Leadership (TL):

- Cronbach's Alpha: 0.823, indicating a good internal consistency.

- Composite Reliability: rho_a (0.829) and rho_c (0.868) are both above the threshold, suggesting reliability.
- AVE: 0.485, slightly below the desired threshold of 0.5, indicating that this construct might not explain as much variance in its indicators as desired.

Table 2 suggests that most constructs in the study exhibit a strong convergent validity, as indicated by high Cronbach's Alpha, Composite Reliability, and AVE values. The exception is transformational leadership, where the AVE is slightly below the threshold, suggesting a need for further investigation or refinement of this construct's indicators.

Table 2. Convergent validity.

	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	Average Variance Extracted (AVE)
CC-	0.919	0.929	0.936	0.677
CS-DV-	0.898	0.902	0.921	0.627
DT-	0.939	0.949	0.950	0.733
ED-MOD-	0.948	0.962	0.959	0.795
IC-MED-	0.904	0.953	0.910	0.591
TL-	0.823	0.829	0.868	0.485

Source: survey data (2024).

4.3. Discriminant Validity

An indicator of discriminant validity measures the extent to which a particular construct or variable can be distinguished from others that may appear unrelated. Scale validation requires a critical check to ensure that distinct constructs do not overlap excessively [180].

4.3.1. Fornel and Lacker

In order for a construct to satisfy the Fornel and Lacker criteria, its Average Variance Extracted (AVE) must be greater than the square of the correlation of each other construct in the model, according to the findings of Ramayah [180]. Fundamentally, the construct exhibits a significantly stronger correlation with its indicators when compared to other constructs [178].

When displaying the square root of AVE in Table 3, the diagonal components (e.g., 0.823 for CC) ought to be larger than the off-diagonal components within the same row and column.CC meets the criteria if the sum of its correlations with other constructs (which vary between 0.110 and 0.866) is greater than 0.823. In each row and column, the diagonal components, representing the square roots of AVEs, invariably have a greater number than the off-diagonal elements. This characteristic is consistent across all constructs. Despite being less than the square root of AVE for both variables, the extremely high correlation (0.866) between CC and DT indicates a noteworthy association that merits further investigation.

Table 3. Fornell and Lacker criteria.

Fornell and Lacker Criteria	CC-	CS-DV-	DT-	ED-MOD-	IC-MED	TL-
CC-	0.823					
CS-DV-	0.574	0.792				
DT-	0.866	0.613	0.856			

Table 3. *Cont.*

Fornell and Lacker Criteria	CC-	CS-DV-	DT-	ED-MOD-	IC-MED	TL-
ED-MOD-	0.110	0.235	0.146	0.892		
IC-MED-	0.285	0.501	0.325	0.512	0.769	
TL-	0.583	0.725	0.542	0.169	0.303	0.697

Source: survey data (2024).

4.3.2. HTMT

The Heterotrait-Monotrait Ratio (HTMT)criterion is a relatively newer approach to assessing discriminant validity [181]. It compares the mean of the heterotrait-heteromethod correlations (correlations between different constructs) with the mean of the monotrait-heteromethod correlations (correlations within the same construct). A value less than 0.85 or 0.90 (depending on the source) is typically indicative of discriminant validity [178].

As indicated in Table 4, the HTMT values were all below the threshold of 0.85 or 0.90, suggesting a good discriminant validity. The highest HTMT value observed was between CC and DT (0.928), which was very close to the threshold, indicating a potentially strong relationship. The rest of the HTMT values were well below the threshold, reinforcing the evidence of discriminant validity among the constructs.

Table 4. HTMT criteria.

HTMT Criteria	CC-	CS-DV-	DT-	ED-MOD-	IC-MED	TL-
CS-DV-	0.627					
DT-	0.928	0.652				
ED-MOD-	0.115	0.250	0.151			
IC-MED-	0.239	0.443	0.274	0.605		
TL-	0.735	0.817	0.634	0.181	0.268	
ED-MOD- × IC-MED-	0.022	0.148	0.044	0.097	0.098	0.098

Source: survey data (2024).

Thus, both tables suggest a strong discriminant validity among the constructs in the study. The Fornell and Larcker criterion was consistently met, and the HTMT values were generally below the threshold. However, the relatively high correlations and HTMT values for certain pairs of constructs (such as CC and DT) may suggest a close relationship that should be carefully considered in the research context.

4.4. Model Fitness

As per the findings of Table 5, the provided model fit summary indicates a poor fit of the estimated model to the data in a structural equation modelling context. Key points from the summary are:

Table 5. Model Fft.

Model Fit Summary	Saturated Model	Estimated Model
SRMR	0.118	0.143
d_ULS	11.994	17.572
d_G	5.520	5.596
Chi-square	9067.137	9217.817
NFI	0.560	0.552

Source: Survey data (2024).

SRMR (Standardized Root Mean Square Residual): Both the saturated and estimated models had SRMR values (0.118 and 0.143, respectively) that exceeded the preferred threshold of 0.08, suggesting a poor fit [182].

d_ULS and d_G (Discrepancy Functions): The values for both d_ULS (11.994 and 17.572) and d_G (5.520 and 5.596) increased from the saturated to the estimated model, indicating a worse fit for the estimated model.

Chi-square: The high values for both models, (9067.137) for the saturated model and (9217.817) for the estimated model, typically point to a poor fit, although interpretation should consider sample size and degrees of freedom [183].

NFI (Normed Fit Index): With values of 0.560 and 0.552, both models fellsignificantly below the desired threshold of 0.90, suggesting an inadequate fit [184].

4.5. Hypothesis Testing

4.5.1. Direct Relationship

The hypothesis testing results in Figure 3 revealed significant findings across various aspects of corporate culture, digital transformation, transformational leadership, and their impacts on corporate sustainable performance and innovation capability.

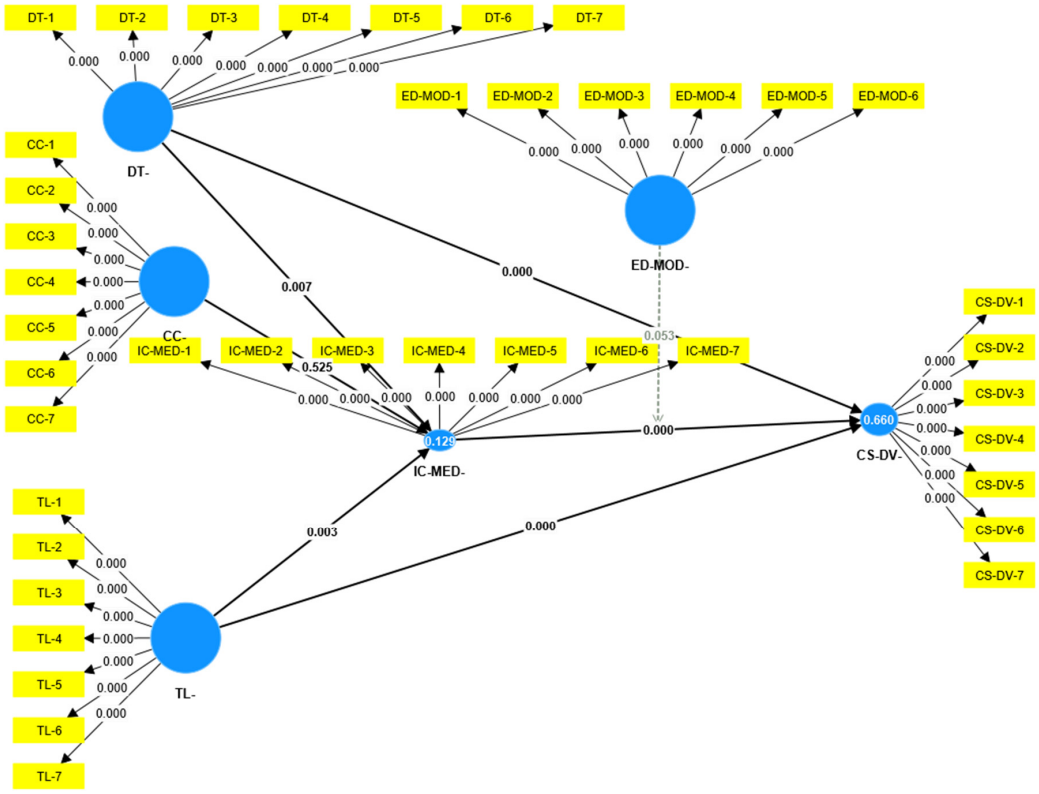

Figure 3. Hypothesis testing model source: survey data (2024).

Hypothesis 1 (H1). *Corporate sustainable performance is positively affected by organizational culture.*

Hypothesis 2 (H2). *The implementation of digital transformation has a beneficial influence on the sustainable development of companies.*

Hypothesis 3 (H3). *Corporate sustainability is significantly impacted by transformational leadership.*

Hypothesis 7 (H7). *The relationship between corporate culture and innovation capabilities is significant.*

Hypothesis 8 (H8). *The relationship between digital transformation and innovation capabilities is significant.*

Hypothesis 9 (H9). *The relationship between transformational leadership and innovation capabilities is significant*.

Hypothesis 10 (H10). *The relationship between innovation capabilities and corporate sustainable performance is significant*.

As indicated in Table 6,forH1, which posits a positive effect of corporate culture on corporate sustainable performance, the data show an original estimate of 0.019, a T-statistic of 4.635, and a P-value of 0.000. This strongly supports the hypothesis, indicating a significant positive relationship between corporate culture and sustainable performance.

Table 6. Direct relationship between variables.

Relationship	Original Sample (O)	Standard Deviation	T Statistics	*p* Values
H1: CC- -> CS-DV-	0.019	0.031	4.635	0.000
H2: DT- -> CS-DV-	0.330	0.054	6.139	0.000
H3: TL- -> IC-MED-	0.191	0.065	2.943	0.003
H7: CC- -> IC-MED-	0.070	0.110	4.635	0.007
H8: DT- -> IC-MED-	0.282	0.105	2.685	0.007
H9: TL- -> CS-DV-	0.559	0.049	11.508	0.000
H10: IC-MED- -> CS-DV-	0.276	0.042	6.529	0.000

Source: Survey data (2024).

In the case of H2, the results of assessing the impact of digital transformation on sustainable corporate development are quite compelling. With an original estimate of 0.330 and a T-statistic of 6.139, coupled with a *p*-value of 0.000, the evidence robustly confirms the positive influence of digital transformation on sustainable development.

The analysis of H3, concerning the influence of transformational leadership on innovation capability, also yields supportive results. The original estimate stands at 0.191, and the T-statistic of 2.943, along with a *p*-value of 0.003, validates the hypothesis of a significant positive influence of transformational leadership on innovation capability.

H7 investigates the effect of corporate culture on innovation capability and presents an original estimate of 0.070, T-statistic of 4.635, and *p*-value of 0.007. These numbers confirm the assumption claiming that corporate culture influences innovation capacity positively.

Concerning H8 (which deals with the impact of digital transformation on innovation capabilities), the results show a positive relationship. The original estimate is 0.282; the T-statistic is 2.685; and the *p*-value is 0.007, which leads to accepting the hypothesis that digital transformation has a positive effect on innovation capabilities.

In H9, the data on analyzing the effect of transformational leadership on corporate sustainability are especially remarkable. The original estimate of 0.559, a high T-statistic of 11.508, and a *p*-value of 0.000 offer strong evidence in favor of the hypothesis, indicating a significant positive impact of transformational leadership on corporate sustainability.

Last, H10, concerning the influence of innovation capability on sustainability performance, gives an original estimate of 0.276, a T-statistic of 6.529, and a *p*-value of 0.000. This is in line with the hypothesis and thus confirms that innovation capability positively influences sustainable performance.

All data, without exception, support the hypotheses and show the significantly positive relationships between corporate culture, digital transformation, transformational leadership, innovation capability, and corporate sustainability.

4.5.2. Mediation

The mediation analysis reveals varied results regarding the role of innovative performance in mediating the relationships between transformational leadership, digital transformation, corporate culture, and organizational sustainability.

Hypothesis 4 (H4). *The impact of transformational leadership and organizational sustainability is mediated by innovative capabilities*.

Hypothesis 5 (H5). *The impact of digital transformation and organizational sustainability is mediated by innovative capabilities*.

Hypothesis 6 (H6). *The impact of corporate culture and organizational sustainability is mediated by innovative capabilities*.

As per the findings of Table 7,the analysis indicates a significant mediation for H4, examining the mediation effect of innovative performance between transformational leadership and organizational sustainability. The original sample estimate is 0.053, with a T-statistic of 2.685 and a *p*-value of 0.007. These figures suggest that innovative performance does play a significant mediating role in the relationship between transformational leadership and organizational sustainability.

Table 7. Mediation.

Relationship	Original Sample (O)	Sample Mean (M)	STDEV	T Statistics	*p* Values
H4: TL- -> IC-MED- -> CS-DV-	0.053	0.053	0.020	2.685	0.007
H5: DT- -> IC-MED- -> CS-DV-	0.078	0.077	0.030	2.553	0.011
H6: CC- -> IC-MED- -> CS-DV-	-0.019	-0.018	0.031	0.635	0.525

Source: survey data (2024).

The results of H5, which focuses on the mediation effect of innovative performance between digital transformation and organizational sustainability, are similarly significant. The original sample estimate stands at 0.078, and the T-statistic is 2.553, coupled with a *p*-value of 0.011. This indicates a substantial mediating effect of innovative performance in the relationship between digital transformation and organizational sustainability.

However, the scenario changes with H6, assessing the mediation role of innovative performance between corporate culture and organizational sustainability. Here, the original sample estimate is −0.019, the T-statistic is relatively low at 0.635, and the *p*-value is high at 0.525. These results suggest a lack of significant mediation by innovative performance in the relationship between corporate culture and organizational sustainability.

The mediation analysis in Figures 4–6 demonstrates that innovative performance significantly mediates the impact of transformational leadership and digital transformation on organizational sustainability. However, it does not significantly mediate the relationship between corporate culture and organizational sustainability.

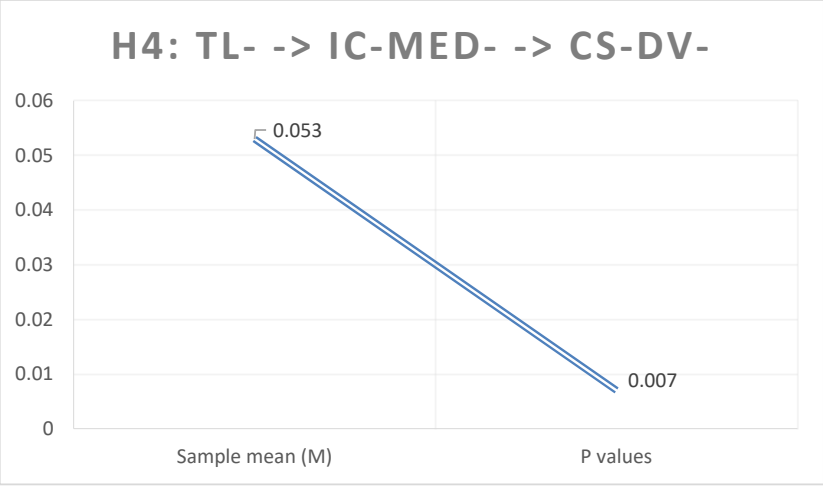

Figure 4. First Mediation graph source: survey data (2024).

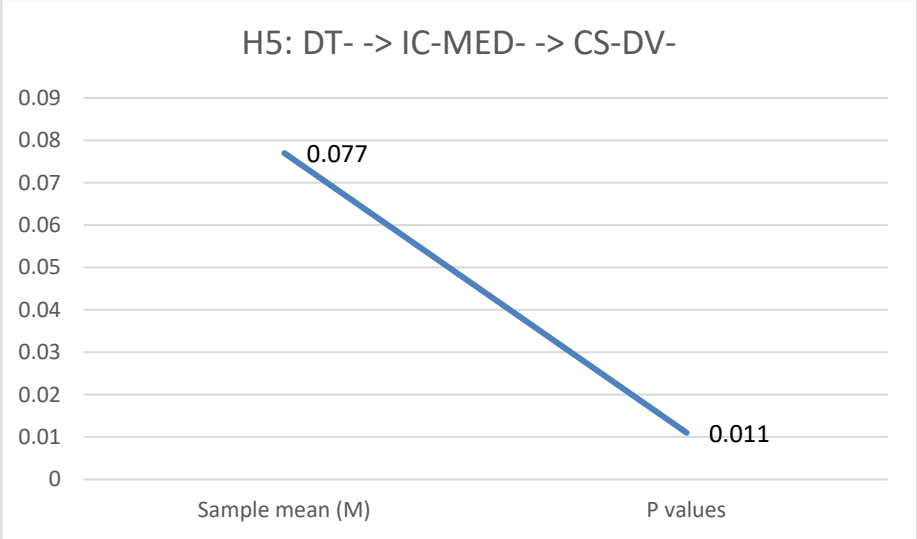

Figure 5. Second Mediation graph. Source: survey data (2024).

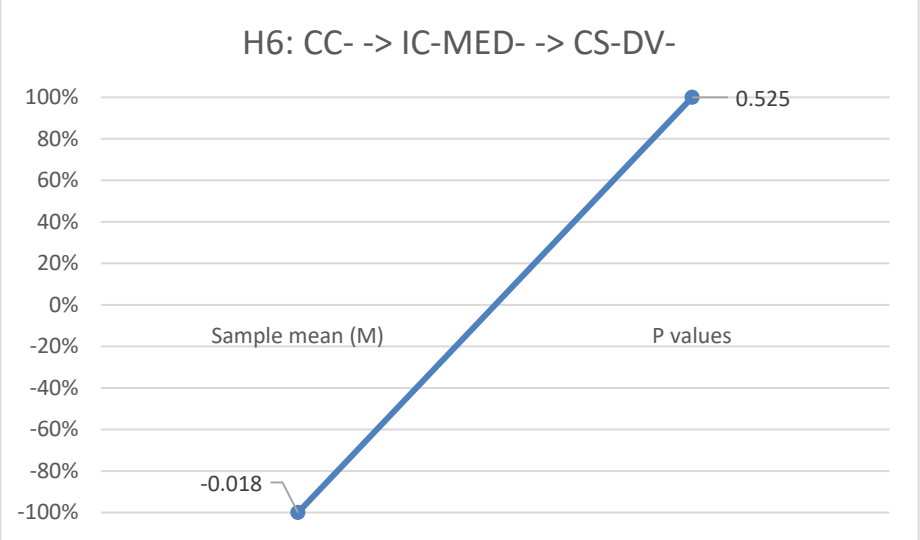

Figure 6. Mediation graph. Source: survey data (2024).

4.5.3. Moderation

The result for hypothesis H11, which tests the moderating effect of environmental dynamism (ED-MOD) on the relationship between innovativeness (IC-MED) and company sustainable performance (CS-DV), indicates a significant moderating effect.

Hypothesis 11 (H11). *The relationship between innovativeness and company performance is significantly moderated by environmental dynamism.*

As per the findings of Table 8, the original sample estimate (O) for this hypothesis is 0.071, and the sample mean (M) is very close to this at 0.070, suggesting consistency in the effect size. The standard deviation (STDEV) for this effect is 0.037, which is relatively small, indicating a certain level of precision in the estimate. The T-statistic is 2.934, which is well above the threshold typically used to denote statistical significance (usually around 1.96 for a 95% confidence level). This suggests that the result is not due to random chance and that there is a statistically significant relationship. The *p*-value is 0.000, which is far below the conventional threshold of 0.05 for statistical significance. This low *p*-value indicates a

very low probability that the observed effect is due to random variation, thereby strongly supporting the hypothesis.

Table 8. Moderation.

Relationship	Original Sample (O)	Sample Mean (M)	STDEV	T Statistics	*p* Values
H11: ED-MOD- × IC-MED- -> CS-DV-	0.071	0.070	0.037	2.934	0.000

Source: survey data (2024).

The analysis indicates that environmental dynamism significantly moderates the relationship between innovativeness and a company's sustainable performance. This suggests that the strength or direction of the relationship between innovativeness and sustainable performance is influenced by environmental dynamism, affirming the proposed H11 hypothesis.

5. Discussion, Conclusions, and Limitations

5.1. Discussion

By examining the sustainability performance of businesses concerning digital transformation, transformational leadership, and corporate culture, this study builds upon prior research from a resource-based approach. Due to these extraordinary efforts, the researchers have learned that innovation capabilities are significantly correlated with digital transformation, transformational leadership, and company culture. The results of this study lend credence to the hypothesis that an organization's sustainability performance is influenced by organizational culture, digital transformation, and transformational leadership. When examining the association between corporate culture and corporate sustainability success, it was found that innovation capacity does not serve as an effective mediator. Innovation capabilities serve as a mediator for a company to achieve digital transformation, transformational leadership, and sustainability success. Environmental dynamism moderates the relationship between innovation capability and corporate sustainability performance.

Contrary to the notion that company culture obstructs sustainable development, several studies have indicated that the opposite is true [58]. Researchers argue that the presence of varied cultural traditions is the fundamental reason for this disparity, and this research aims to address it. The findings indicate that environmental dynamism has an impact on the relationship between innovative capabilities and the long-term success of companies.

Modern digital technologies such as the Internet of Things, blockchain, artificial intelligence, and big data analytics have unveiled a new era. According to Al-Hakimi et al. [59], the strategic objective of digital transformation is gaining significance due to the potential advantages it can offer domestic economies, including sustainable growth and a competitive edge. Microeconomic research predominantly concentrates on businesses due to their pivotal significance in instigating initiatives for sustainable development and digital transformation. Businesses enthusiastically embrace digitalization as they strive to achieve breakthroughs and transformations in the digital economy [62]. Therefore, it is advisable to explore their capacity to obtain an edge over others while simultaneously promoting sustainable expansion.

Academics and companies are emphasizing digital transformation considerably, while sustainability practices are being more widely recognized within the business sector. Hossain et al. [63] assert that digital transformation can enhance operational and production efficiency through cost reduction and idea generation. Research conducted by Lăzăroiu et al. [185] indicated that organizations are more inclined to take risks due to the increased operational flexibility and accelerated procurement of financial resources induced by digital transformation. Instances of fraudulent activities can be diminished, and overall business quality can be improved through digital transformation [67]. Implementing digital trans-

formation incentivizes businesses to adopt a more proactive stance towards environmental protection. This is accomplished through a greater implementation of environmentally friendly technologies and decreased carbon emissions [68].

The growing demand demonstrates organizations' increasing significance on sustainability for research concerning incorporating the SDGs into the digital transformation process. From the perspective of micro businesses, this study sought to empirically examine how digital transformation contributes to the sustainability of organizations. The study explicitly aimed to investigate digital transformation's favorable impacts on the environment and the economy. Previous studies have largely arrived at comparable findings [69–71].

Islam, French, and Ali [72] posited that transformational leaders influence their adherents' performance by cultivating and reinforcing their social connections. A leader motivates subordinates to surpass expectations by establishing an emotional connection with them through transformational leadership techniques. Organizations require additional visionary leaders to adjust to their changing surroundings effectively. A transformational leader possesses the capacity to modify the culture of a firm and align all of its strategies with the external environment. Businesses should redirect their focus from pursuing immediate profits at the expense of the environment and instead prioritize building interdependence and promoting ecological innovation. Businesses gain multiple advantages when they adopt sustainable practices. These benefits encompass enhanced brand reputation, decreased costs, higher shareholder satisfaction, heightened productivity, and more. Individuals, organizations, and governments widely adopt sustainability as a fundamental component of their objectives. The business environment is undergoing significant changes due to the increasing societal awareness of the environment. These changes are motivated by a collective dedication to a more environmentally friendly and enduring future. Businesses that share their expertise may function more efficiently, be more valuable, and maintain a competitive advantage. Sarfraz, [186], asserted that knowledge, encompassing intangible assets, habits, and readily replicable creative processes, stands as the preeminent asset for an organization. Adaptability is essential in gaining a competitive edge and exchanging information augments knowledge resources [187]. Research findings indicate that a company's performance could be enhanced through its capacity for innovation [188].

5.2. Conclusions

As highlighted by numerous academics, sustainability and digitalization are two significant megatrends that profoundly impact society and the economy [189–191]. The objectives of this study comprised an assessment of the sustainability performance of Chinese manufacturing organizations and an examination of the interrelationships among digital transformation, transformational leadership, company culture, and sustainability. The study determined that implementing digital transformation, transformational leadership, and a strong business culture can significantly improve the sustainability performance of corporations. When analyzing the relationship between sustainability success and corporate culture, innovation capacity was found to be an inadequate mediator. For digital transformation, transformational leadership, and the long-term success of organizations, the capacity for innovation was found to be a significant mediator. In addition, the association between the capacity for innovation and sustainable performance in organizations is influenced by environmental dynamism.

According to the findings, digitalization, transformational leadership, and corporate culture play major roles in helping companies reap the benefits of sustainable growth. Digital transformation yields advancements in industrial infrastructure, the overall efficiency of production, the reconfiguration of business models, and the optimization of resource allocation and utilization. Organizations that adopt and achieve proficiency in digital technology may potentially secure a competitive edge and cultivate unique manufacturing capabilities. This, therefore, contributes to environmental and societal sustainability in the long run. It has been demonstrated through research by multiple studies [69,192,193]

that digital transformation increases the sustainability premium. The present investigation supports the findings mentioned above.

The operational environment significantly impacts the organizational ethos of a company. Before this investigation, most research examining the long-term relationship between corporate culture and performance [194–198] primarily ignored the factors that interact with culture.

Our analysis demonstrated the interrelationships of the most vital components and lent credence to our theory. According to research, organizational innovation and sustainable innovation performance are positively and directly correlated [194]. Consequentially, cultivating an atmosphere that promotes innovation is imperative for the long term. The study's findings are significant for organizations seeking to improve their sustainability performance. Sarfraz, Ye et al. [186] suggest that sustainability initiatives can be propelled by fostering a culture of creativity and adopting new methodologies.

The research established a positive and statistically significant correlation between transformative leadership and firm performance. Long 2023 [75] and Mehedintu and Soava [79] concur that a company's performance is significantly influenced by its pioneering executives. However, transformational leadership does provide a competitive edge to organizations; the degree to which this advantage is actualized is contingent upon the specific operations of each company.

5.3. Implications

This study significantly enhances the current body of literature on the sustainable performance of firms in multiple respects. The objective of this study was to shed light on the intricate mechanism through which long-term performance is impacted by organizational culture. By incorporating culture as a component and elucidating this fundamental mechanism, this study contributes to advancing knowledge regarding sustainable performance.

The environment in which an organization operates greatly influences the established culture. Although numerous studies have investigated the long-term impact of company culture on performance, relatively few have explored the interplay between culture and other organizational components. Instead, these studies have regarded culture as an independent variable, neglecting its intricate character.

Further investigation is required to comprehend the relationship between sustainable performance and organizational culture. Notably, the manufacturing sector has received limited attention in prior research [197,198]. By examining the industrial sector via the lens of the cultural promotion of sustainable performance, this study contributes to the growing body of literature on sustainable performance, particularly contributing significantly to the existing body of knowledge on corporate sustainable performance from a theoretical standpoint. It elucidates how corporate culture can influence sustainable performance and the governing regulations, either positively or negatively.

The study's findings illuminate how manufacturing businesses might achieve long-term success with the assistance of corporate culture. It is advisable for companies in the manufacturing sector, especially digital enterprises that stress ongoing innovation and growth, to cultivate a culture that emphasizes adaptability rather than strict control. In addition, company executives should abandon transactional leadership in favor of transformative leadership. In addition, firms that primarily depend on manual labor but do not prioritize employee innovation should cultivate a blend of transactional leadership and a culture of control. Ultimately, the manufacturing sector must prioritize the improvement of its innovation capacity to achieve economic, social, and environmental sustainability, as it performs an essential role in sustainable development.

Organizational endeavors to undergo digital transformation necessitate more financial and technical support. Companies may enhance their long-term sustainability by embracing digital transformation, and policymakers must acknowledge this. Policymakers should initiate nationwide initiatives focused on Industry 4.0 and implement other effective policies to stimulate technological investment and offer customized incentives. These measures

ensure the sustained functionality and flexibility of enterprises and contribute to the growth of strong and sustainable organizations, a critical attribute during periods of worldwide unrest and perils such as the ongoing COVID-19 catastrophe.

A company's digital transformation strategy should include integrating digital operations with overarching business plans, incorporating sustainability objectives into the process, and acknowledging the transformative potential of digital technology [197]. Businesses can contribute to the attainment of sustainable development objectives by proactively adapting their business models to leverage digital technologies and attain a competitive edge.

Leadership style greatly influences a firm's sustainable performance, and a knowledge-sharing culture within organizations is essential for improved firm performance. These findings contribute to the current understanding of this field. Furthermore, enterprises can enhance their operational effectiveness by fostering a culture of knowledge dissemination and striving to achieve greater sustainability.

5.4. Limitations and Future Research

While this research does have many beneficial aspects, manufacturing companies in China are the subject of this investigation, meaning the potential generalizability of the results to multinational organizations is a matter of contention. To assess the generalizability of the findings, it would be beneficial for future studies to investigate their applicability in countries other than China. Only the mediating effect of innovative capacity was considered in this research. Other potential avenues via which digital transformation, transformational leadership, and company culture may impact corporate sustainable performance exist. Exploring the specific influence of business culture on long-term success might be a promising topic for future investigation.

The study exclusively recruited individuals from China's manufacturing sector for its sample, rendering its findings inapplicable to other industries or distinct production configurations. This investigation concentrated on a negligible subset of the population from a single region, ignoring the rest of China. Moreover, supplementary processes that might have been critical to the organization were disregarded to examine the impacts of transformational and revolutionary leadership styles on specific business sustainability initiatives. An inherent limitation of this study is its heavy reliance on quantitative methodologies for data gathering. To achieve the study objectives, it is advisable to employ qualitative procedures for data collection, as relying solely on self-reporting methods like questionnaires can result in results that are influenced by bias.

To guarantee that new companies are accurately portrayed, future studies need to replicate our findings using a varied selection of businesses [198]. To increase the credibility of the conclusions, future research should also attempt to collect examples from various regions of the country. Additionally, it would be intriguing to ascertain whether the findings were comparable to or dissimilar from those of prior investigations should the researcher examine the various components of the study from many perspectives. In future research, scholars should be mindful of this relationship and endeavor to extract further insights by considering additional characteristics that may impact leaders' future success across different frameworks and leadership styles. Furthermore, to address the deficiencies in the existing literature, forthcoming studies should prioritize investigating the mediating and moderating dynamics of interactions. Researchers should utilize quantitative and qualitative methodologies to collect data that accurately represent the factors being studied. Structural equation modeling is highly recommended as an analytical tool for future researchers due to its superior ability to streamline the underlying model of the investigation.

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