

Linking Organizational Dynamics to Digital Capabilities and ESG Outcomes: A Market-Oriented Approach

Abstract

Environmental, Social, and Governance (ESG) represent a concept of sustainable development that integrates corporate governance, social responsibility, and environmental concerns. Most ESG research focuses on large-size publicly traded companies, and limited attention is paid to entrepreneurial firms. Our study explores how market orientation, organizational leadership, and organizational culture lead to digital capabilities and ESG performance of Chinese entrepreneurial organizations. This study outlines a comprehensive framework grounded on market orientation and resource-based theories. Using structural equation modeling, we empirically test our hypotheses where findings indicate that organizational leadership, culture, and market orientation positively influence both digital capabilities and ESG performance. Additionally, we observed that cultural factors insignificantly affect digital capabilities. This research contributes to understanding corporate sustainability for academics, stakeholders, regulators, and policymakers, offering key theoretical and practical insights for advancing corporate sustainability.

Keywords: ESG, Organizational Leadership, Market Orientation

Introduction

Humanity has achieved remarkable progress through advancements in science, technology, the economy, and society (Aguinis et al., 2024; Giovannoni & Fabietti, 2013). However, the growing challenges of climate change, resource depletion, poor working conditions, and corporate scandals have intensified public demand for businesses to assume greater environmental, social, and ethical responsibilities. This shift is reflected in the increasing interest from investors and customers in sustainability and corporate social responsibility, with expectations that companies align their operations with ethical standards (Yang et al., 2024). In response to these challenges, the UN Commission on Environment and Development introduced the concept of sustainable development and published the "Brundtland Report" (Brundtland,

1987). The ESG (Environmental, Social, and Governance) value concept is grounded in this principle of sustainable development, emphasizing the crucial role of businesses in achieving long-term economic and social sustainability (Buallay, 2019; Villamor & Wallace, 2024).

The core idea of ESG is to prioritize social and economic benefits while also addressing environmental resource management, corporate social responsibility, and good governance (Rau & Yu, 2024). Key environmental concerns include pollution control, renewable energy adoption, greenhouse gas emission reductions, and the overall impact on the environment (Kräussl et al., 2024). In maximizing profits within legal boundaries, businesses also have responsibilities to their stakeholders including suppliers, communities, employees, and customers (Fu et al., 2024). This aspect represents the social dimension of ESG. Governance concerns cover corporate ethics, anti-competitive practices, and shareholder rights protection, focusing on internal systems for self-management, decision-making, legal compliance, and stakeholder engagement (Lindgreen & Swaen, 2010; Zhang & Zhang, 2024). **Moreover, Yang et al (2024), showed that green and technological innovation significantly improve energy and resource efficiency in BRICS economies.**

ESG, as a novel idea of values, has the potential to assist companies in shifting from maximizing profits to sustainable development. The way businesses combine their resources and manage their strategy is greatly impacted by it (Drempetic et al., 2020). Additionally, it plays a significant role in advancing sustainable development and high-quality economic growth (Broadstock et al., 2021). Businesses must be able to fully handle environmental, social, and corporate governance issues in order to differentiate themselves in the more competitive market in the context of economic globalization (Avramov et al., 2022). In industrialized nations, however, investors operating on a regional or global scale take ESG investments seriously. Recent research has started to connect a number of corporate strategy orientations, such as customer, market, and entrepreneurial orientations, with environmental, social, and governance (Brower & Rowe, 2017).

The concept of "market orientation" has gained significant attention in fields such as marketing, innovation, and information science. Market orientation, a concept that has dominated marketing theory and practice in recent decades, can be analyzed from either a behavioral (Kirca et al.,

2005) or cultural perspective (Gangwani & Bhatia, 2024; Manafe et al., 2024). Kohli and Jaworski (1990) and Wasim et al. (2024) describe market orientation as the implementation of marketing principles. While some scholars view it as an independent construct (Farley, 2008), others see it as part of organizational culture (Homburg & Pflesser, 2000; Ranjan & Nayak, 2024) or a type of organizational culture (Deshpandé et al., 1993; Jayawardhana & Weerakoon, 2024). Khizar et al. (2024) argues that market orientation should be understood as a behavioral pattern present to varying degrees across different organizations rather than as a distinct culture.

Organizational culture has become a dominant concept in organizational theory and related fields (Harris & Ogbonna, 2002). **For instance, according to Schein (2010), emphasizes on importance of understanding human behavior in organizations. Similarly, owing to globalization, companies have expanded into diverse cultural contexts.** Orieno et al. (2024) defines organizational culture by how well it aligns with employee needs and fits individual members. Palumbo and Douglas (2024) characterize it as "the shared values and beliefs that help individuals understand organizational functioning and thus provide them with norms for behavior in the organization." Despite the increasing interest in organizational culture, defining and measuring it remains debated (Karmila et al., 2024). However, it is recognized as a crucial tool for management, particularly when rapid responses to external factors are needed. According to Lok & Crawford (2004), understanding the relationship between market orientation, organizational culture, and various performance outcomes is essential for assessing organizational performance and commitment.

Digital capabilities, according to the dynamic capability theory, are organizational capacities that enable the development of new goods and procedures in response to shifting market conditions (Khin & Ho, 2019; Wei & Zheng, 2024)). According to dynamic capability theory, organizations develop abilities to adapt, innovate and reconfigure in the changing environment (Teece, Pisano, & Shuen, 1997). Moreover, it also develops the ability of a business to manage digital technology for the development of new products. (Khin & Ho, 2019). Organizations undergoing digital transformation are required, depending on their objectives, to create multiple competences across a wide range of domains. Businesses that are technologically advanced in the context of the digital sphere thus offer an understanding of digital capabilities, which are crucial prerequisite for attaining digital innovation since the effectiveness of the digitization process depends on the company's ability to manage digital technology (Khin & Ho, 2019; Alkaraan et al, 2024). Digital capabilities, according to Westerman et al. (2012), are a basic building component that can change business models, operational procedures, and customer experiences.

Despite the growing importance of these concepts, current understanding of their interconnections remains fragmented. This study aims to integrate insights from various domains to examine the relationships between market orientation, organizational leadership, culture, digital capabilities, and ESG performance. The study addresses the following research questions:

RQ1. What is the influence of market orientation on ESG performance and digital capabilities?

RQ2. How do digital capabilities and ESG performance depend on organizational leadership?

RQ3. How do digital capabilities and ESG performance depend on company culture?

This study looks at how these constructs relate to one another in the particular setting of Chinese manufacturing companies. Our emphasis on manufacturing companies stems from the fact that this sector has been expanding for a considerable amount of time under generally stable conditions. China offers a rich setting for this research, given its rapid development in both the economy and technology. A postal survey is used as part of the quantitative research design. The proposed relationships were analyzed using structural equation modeling. The association between market orientation, organizational leadership, culture, digital capabilities, and ESG performance is positively shown by the study's findings. This study makes the following research contributions: It will contribute to the body of knowledge regarding the ESG performance of

developed manufacturing enterprises. The impact of corporate culture on digital skills was the second area of inquiry for this research. Third, by better understanding business sustainability, this study aids regulators, policymakers, stakeholders, and academics.

The paper is structured as follows: a review of relevant literature and research hypotheses is presented initially, followed by a description of the research methodology. The findings and theoretical implications are discussed in the final sections.

Literature Review

Theoretical Foundations

Market Orientation Theory

The theory of Market Orientation (MO) posits that businesses can gain competitive advantages by adapting to their consumer environment. As articulated by Kohli and Jaworski (1990), and further developed by (Hurley & Hult, 1998), MO emphasizes the importance of understanding and responding to customer needs and market conditions. By aligning their strategies with these insights, companies can secure competitive advantages such as stronger relationships and increased customer loyalty (Hyvönen & Tuominen, 2007; Kirca et al., 2005). In a dynamic business environment, these advantages are essential for maintaining competitiveness and relevance (Alhakimi & Baharun, 2010; Aziz & Yassin, 2010; Liao et al., 2010). Market Orientation facilitates the development of contextual strategies, enabling firms to tailor their approaches based on their interactions with their environments (Patiro & Sihombing, 2016). The specific antecedents and outcomes of MO can vary depending on the industry and market conditions (Atuahene-Gima et al., 2006; Ellis, 2010). To offer superior products or services, companies practicing MO actively gather and analyze information about their customers' current and future needs. This information is then used to refine and implement strategies that meet those needs effectively (Slater & Narver, 2000).

Resource based view (RBV) Theory

The Resource-Based View (RBV) has long been a cornerstone of academic frameworks, highlighting that an organization's competitive advantage and superior performance stem from its unique, hard-to-replicate resources and capabilities (Barney, 1991; Xiao et al., 2019). This

perspective helps explain why businesses operate differently and achieve varying levels of success. In the digital era, developing new competencies and resources is critical for maintaining a sustainable competitive advantage (Liu et al., 2017; Warner & Wäger, 2019). Strategic orientation, which encompasses a company's commitment to sustainable development, approach to gaining a competitive edge, and decision-making process, reflects how a company's culture and strategic focus influence its performance (Gatignon & Xuereb, 1997; Hakala, 2011). Companies that prioritize technology often invest heavily in new technologies and their application to generate value (Gatignon & Xuereb, 1997). Technological capabilities, in particular, play a crucial role in enhancing organizational performance (Hakala, 2011).

Customer orientation is a central component of a market-oriented strategy, emphasizing the importance of maximizing customer value. This study investigates how customer and technology orientation impact new product development (NPD) effectiveness from a strategic marketing perspective (Peng, 2020). Building on the RBV, the concept of dynamic capabilities has emerged, focusing on how organizations can renew and adapt their resources to remain competitive (Danneels, 2002). In the digital age, exceptional capabilities in integration, configuration, and perception are crucial. Digital capabilities defined, as a company's proficiency in managing information and having a flexible IT infrastructure are essential for navigating rapidly evolving technologies and uncertainties (Khin & Ho, 2019; Levallet & Chan, 2018). This study zeroes in on digital capabilities, exploring their role in effective resource management and addressing complex challenges.

Market orientation and digital capabilities

Additional research on the link between strategic orientation and performance is warranted since, while some scholars have cast doubt on the positive correlation, others have argued that it has a direct and beneficial effect on performance (Zhou et al., 2005). In the context of a rapidly changing digital landscape, it is especially important to understand how and to what degree companies understand the competencies required for strategic direction to influence NPD performance (Foss & Lyngsie, 2014). In view of the rapidly changing digital technology world, we suggest that emerging nations approach the processes of intermediation via the lens of dynamic capacities (Hoskisson et al., 2000). Businesses rely on these talents to identify,

integrate, and reorganize resources in order to maintain a competitive advantage in a dynamic market (Orieno et al., 2024).

It is likely that a company's capacity to adapt to changing market conditions is what allows it to remain competitive during times of environmental uncertainty (Ambrosini & Bowman, 2009). In particular, SMEs may do better if they allocate resources bravely and imaginatively, as technical capabilities raise enterprises' expectations of achieving higher performance (Klingebiel & Rammer, 2014). The importance of businesses being adaptable in their use of technology and digitalization to acquire a competitive advantage and handle uncertain conditions is starting to catch the attention of academics (Lasi et al., 2014). Digital competencies are an essential competency for companies working in a technological context, according to past RBV-based studies. According to our research, an organization's digital capabilities—which deal with how the company handles numerous risks and rapidly evolving technology—are dictated by its information technology infrastructure's adaptability and its capacity for sophisticated data management.

The use of industrial robots in automated assembly lines, for instance, not only provides accurate operations but also increases efficiency and decreases costs for manufacturing organizations. Companies that want to stay ahead of the competition should pay attention to this finding: digital capabilities might help them create more value for their customers (Lenka et al., 2017). In support of this result, another study (Ardolino et al., 2018) shows that product businesses' ability to deliver competitive products is correlated with their adoption of digital technologies. Even in the food and pharmaceutical sectors, digital technology has facilitated the development of new goods by lowering the barriers to entry through the use of analytics and big data. Businesses are able to launch new products and services and make better use of them by leveraging higher-quality digital capabilities (Kirner et al., 2009) since this capability makes market forecasting easier. Adapting to the ever-changing digital landscape of company requires the creation of new digital competencies (Ahuja & Chan, 2021). Accordingly, we propose the following hypothesis based on a more complete picture of the dynamic capacities of the company resource base:

H1: Market orientation positively lead to digital capabilities.

Market orientation and firm ESG performance

Extensive research has been done on the typology developed by (S. Miles, 2017). However, there has been a lack of exploration into how ESG (Environmental, Social, and Governance) factors interact with strategic direction. This represents a missed opportunity for two key reasons. Firstly, ESG factors are increasingly affecting the corporate landscape. Thus, examining how companies implement ESG within the framework of Miles and Snow's typology, which was not fully explored by its creators, could offer valuable insights. Variations in ESG practices might be linked to different strategic orientations (Galbreath, 2010). Galbreath (2010) found that variations in CSR (Corporate Social Responsibility) levels can be attributed to the type of strategy employed according to (R. E. Miles, 1978) typology, with prospectors and defenders demonstrating the highest levels of CSR, and analysts and reactors showing the lowest. **For Chinese manufacturing firms, government rules, like the Air Pollution Prevention and Control Action Plan (2013) and the Environmental Protection Law (2014), have forced businesses to enhance waste management and implement greener technologies (Liu et al., 2022). Nonetheless, there are regional and industry-specific differences in how these rules are enforced (Zhang et al., 2020). Moreover, achieving carbon neutrality by 2060 is one of the lofty climate targets that China has set. Manufacturers have been encouraged by this to invest in renewable energy sources and energy-efficient production techniques. Through the provision of financial incentives, the Green Credit Policy has pushed manufacturers to embrace eco-friendly practices (Zhou, 2020). In addition to it, China has been bringing its regulations closer to international ESG norms. Policies like the China Securities Regulatory Commission's (CSRC) ESG disclosure standards and the Corporate Social Responsibility (CSR) guidelines for state-owned enterprises (SOEs) have encouraged companies to increase responsibility and transparency (Zhou & Wu, 2021).**

The traits of prospectors and defenders such as their top management experience, ability to assess and process information, flexibility, and cautious risk-taking seem to significantly affect corporate social responsibility, as noted by (Galbreath, 2010). Resource-based theory suggests that a firm's competitive advantage and long-term success stem from its unique and highly valued resources and capabilities. By adeptly managing environmental and social risks and opportunities and maintaining effective governance, a company can gain a competitive edge

through its ESG practices. Prioritizing ESG factors can attract investors who value these elements and reduce the risk of negative externalities that could harm the company's reputation and financial performance.

The resource-based theory clarifies the connection between ESG practices and market orientation. A company's resources and capabilities largely determine its strategic orientation and competitive stance. However, the same assets and competencies that contribute to a competitive advantage also influence ESG practices. According to resource-based theory, while unique assets and abilities can confer competitive advantages, they must be managed effectively to avoid potential issues. Therefore, a company's strategy should integrate ESG considerations to remain competitive and sustainable over the long term. Thus, the resource-based theory and Miles et al.'s (1978) strategic framework can help explain the relationship between variations in ESG disclosure and business strategy. Yuan and Cao (2022) argue that firms focused on innovation (prospectors) tend to excel in CSR more than those focused on efficiency. Prospectors are more likely to use ESG as a strategic resource and may gain greater benefits from it. Based on this, the initial hypothesis is as follows:

H2: Market orientation positively lead to firm ESG performance.

Organizational leadership and digital capabilities

A wealth of research has explored the link between leadership and performance (Sarros et al., 2011). Today, digital leadership is recognized for its positive effect on organizational capabilities (Sarros et al., 2011). Mohamed (2022) found that digital leadership enhances innovative work behavior and that subjective well-being, digital training, and digital leadership all contribute positively to job motivation [12]. Moreover, digital leadership affects specific performance outcomes, including digital maturity and business model innovation, as evidenced by (Mihardjo et al., 2019). Al-Husban, Almarshad, and Altahrawi (2021) highlighted both the significant direct and indirect positive effects of digital leadership on organizational performance. In contrast, Muniroh, Hamidah, and Abdullah (2022) observed that digital leadership does not directly impact employee performance. Despite these findings, the influence of digital leadership on overall organizational performance remains ambiguous.

Many studies have also examined the role of digital culture (Edquist, 2010; Sarros et al., 2011). For instance, there is considerable evidence showing that senior executives in strategic roles affect organizational culture. One major challenge in fostering an innovative culture is convincing top managers to establish an appropriate framework, a task that is both vital and difficult. Deuze (2006) describes digital culture as a dynamic set of norms, values, and expectations shaping interactions and communication in the modern networked society. Duerr et al. (2018) argue that digital culture fosters innovation and the creation of new information, leading to the development of new products and services. Nonetheless, Muniroh et al. (2022) found no effect of digital culture on employee performance. While digital transformation relies on technology, organizations need to hire individuals skilled in digital tools to achieve it. This shift presents a strategic opportunity for organizations to increase revenue. Leaders play a crucial role due to their responsibility in selecting, preparing, training, and guiding team members. Consequently, traditional corporate strategies and processes have evolved due to advancements in digital technology and emerging digital threats.

Previous research has pointed out a gap in understanding how digital leadership influences employees' digital competencies and culture. Erhan, Uzunbacak, and Aydin (2022) explored various mediating variables in a forward-looking context, suggesting that digital leadership could be a fundamental factor. Khin and Ho (2019) propose that future technical culture might serve as a significant and testable determinant of innovation. It would be beneficial to examine previously unexplored aspects, such as those related to digital culture. Additionally, Adie et al. (2022) emphasize the importance of digital culture within organizations. El Sawy et al. (2020) identified a link between digital leadership and organizational capabilities after a decade of digitalization research. (Aramburu et al., 2021) suggested that digital capacity is a critical source of long-term competitive advantage for SMEs. However, there remains a gap in understanding how employees' digital capabilities affects organizational leadership. Therefore, we hypothesize that organizational leadership may influence digital capabilities.

H3: Organizational leadership positively affect the digital capabilities.

Organizational leadership and firm ESG performance

Mason and Brown (2014) are foundational to higher-order theory, which posits that executives are central to strategic decision-making within a company. These leaders craft highly personalized interpretations and judgments about organizational conditions, shaped by their psychological traits and limited rational capacity. Senior managers, who oversee the execution of strategies as well as their development, have a significant impact on shaping and altering corporate behavior due to their decision-making authority. Thus, effective leadership is crucial for implementing major organizational changes and devising forward-looking company strategies.

Research has explored various dimensions of leadership, including the psychological aspects of leaders' personalities, mindsets, and cognitive processes, as well as the environments that influence transformational leadership behaviors. Transformational leaders articulate a clear and consistent perspective on environmental responsibility, sharing environmental knowledge to demonstrate commitment and promote sustainability. They also integrate environmental performance into corporate strategic planning by advocating a unified organizational vision, emphasizing environmental stewardship, and facilitating information sharing. According to social identity theory, the CSR groups individuals belong to can be influenced by their attitudes and behaviors (Tourigny et al., 2019).

Stakeholder theory, developed by the Stanford Research Institute in 1963, highlights the reciprocal relationship between a corporation and its stakeholders. Stakeholders are individuals or groups, such as employees and investors, who rely on the business to help them achieve their goals and are essential for the company's growth. Freeman and McVea (2005) describe stakeholders as "individuals or groups who can affect or are affected by the achievement of a firm's organizational objectives." Executives must consider the interests of all stakeholders—including small and medium shareholders, external investors, creditors, employees, and the government—alongside the company's broader objectives. Additionally, they enhance business transparency and establish a strong corporate governance framework (Bandsuch et al., 2008). Given this initial premise, we propose the following hypothesis:

H4: Organizational leadership positively affect the firm ESG performance.

Culture and digital capabilities

The interplay between culture and information technologies (IT) has garnered significant attention in previous studies (Duerr et al., 2018; Hartl, 2009; Leidner & Kayworth, 2006). However, the role of digital culture in achieving digital maturity remains underexplored. Hartl (2009) identified twelve cultural principles essential for digital transformation, categorized into three cultural orientations: adaptability and flexibility, interior orientation, and external orientation. Schein (1996) suggests that corporate culture consists of three levels: artifacts, beliefs and values, and underlying assumptions. Organizational culture can profoundly affect digital transformation, according to (Kane et al., 2017; Leidner & Kayworth, 2006; Vial, 2021). To adapt to the digital age, organizations must adjust their structures, beliefs, and assumptions and update their cultural traits (Kane et al., 2017; Leidner & Kayworth, 2006; Vial, 2021). This involves changing interactions within the company through digital leadership, new technologies and learning platforms, a digital mindset, and new ethical practices (Kane et al., 2017; Mikalef & Gupta, 2021; Vial, 2021).

Besides having a digital strategy, many scholars emphasize the importance of employees' digital skills in the digitalization of new businesses (Parida et al., 2016; Prokesch, 2009). Employees' digital capabilities reflect their ability to leverage digital technologies, which is influenced by their technical skills and prior digital experience (Arkhipova & Bozzoli, 2018; Bassanini et al., 2001). For instance, implementing big data analytics requires team members to be proficient with software for storing, processing, and analyzing large datasets to model scenarios, establish networks, or provide causal explanations (Arkhipova & Bozzoli, 2018). Such capabilities can lead to the development of innovative digital products, services, or workflows (Ritter & Gemünden, 2004). Therefore, we propose that employees' digital skills will moderate the effect of a digital strategy on the digitization of new enterprises.

Digital capabilities of employees include skills such as proactively sharing documents and information through digital platforms, like cloud services (Fischer & Karl, 2022). Moreover, Marnoto et al (2024) discussed the role of digital technologies in the family owned businesses. They may also involve using digital communication channels, including mobile and social media (BarNir et al., 2003). Consequently, employee digital proficiency can enhance the impact of a

digital strategy on digital processes and products/services. High digital capabilities allow staff to monitor workflows in real time, improving transparency and identifying areas for digital enhancement (Iivari et al., 2016; Knight & Cavusgil, 2004). Based on this discussion, we propose the following hypothesis:

H5: Culture has positive impact on digital capabilities.

Culture and firm ESG performance

Differences in management behavior and stakeholder activism are influenced by geographic diversity (Brammer et al., 2006; Williams & Aguilera, 2008). Fortanier, Kolk, and Pinkse (2011) highlight that multinational corporations encounter heightened normative and coercive pressures from institutions due to variations in national laws and cultural contexts (Engel De Abreu et al., 2012). Hofstede (1980) and Schwartz (2012) illustrate that national cultural norms differ between countries, which accounts for the variation in management practices across nations. Diverse belief systems, customs, traditions, and value frameworks all contribute to these cultural differences (Ho et al., 2012). National culture also shapes ethical decision-making and managerial attitudes (Budhiraja & Modi, 2021).

Roy et al. (2019), through their study of businesses in five Asian countries, demonstrate how national culture can bridge the gaps found in various fragmented studies on corporate governance and environmental responsibility. Shao and Ünal (2019) explored the role of culture as a crucial factor in understanding differing business decisions. According to Doidge, Karolyi, and Stulz (2010), corporate governance behavior is more influenced by national factors than by organizational structures. Critics of cultural factors argue that globalization and free capital movement challenge their significance (Bird, 1998). While these forces do break down national barriers and contribute to the convergence of institutional rules, they do not fully replace national culture with a global one (Hansmann & Kraakman, 2000). This perspective is deemed unrealistic (Bird, 1998).

Hansmann and Kraakman (2000) provide a relevant reference with their study on legal systems across 49 countries, which reveals that investor rights and business practices vary significantly among nations despite globalization and unrestricted capital flows. Societies with a long-term

orientation are more pragmatic and prioritize epistemic flexibility over enduring traditions. The concept of sustainability, which emphasizes the prudent use of resources, aligns well with cultures that have a strong long-term focus. Based on this discussion, the following testable hypotheses about the impact of culture on company ESG performance can be proposed:

H6: Culture has positive impact on firm ESG performance.

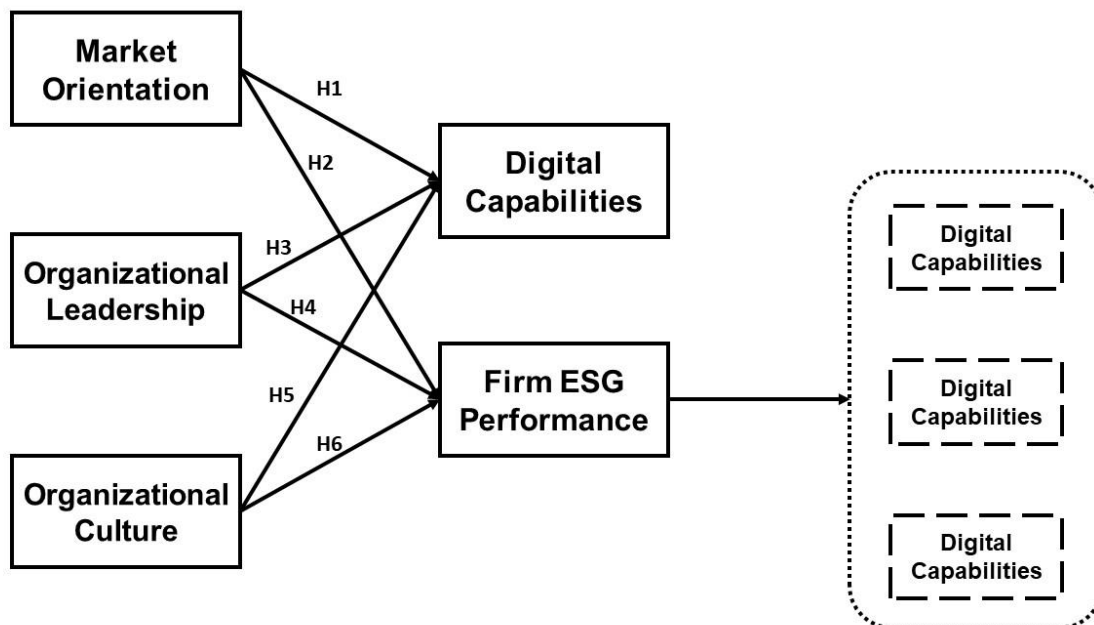


Figure 1: Conceptual Framework of the Study

Research Methodology

Sample and Data Collection

This study falls under the Positivism philosophy and quantitative data collection is done using administered questionnaire. As the "world's factory," China produced everything

from consumer goods and manufacturing to electronics and textiles by the early 21st century. Heavy expenditures in infrastructure, especially in logistics and transportation, accompanied the nation's increasing industrialization, facilitating effective supply chains both domestically and abroad. This made it possible for China to meet the increasing demand from around the world and established it as a key hub in the global manufacturing system (Cheng & Zhang, 2020).

There were two primary reasons why middle and senior managers of Chinese manufacturing enterprises answered our questionnaire. The manufacturing sector is the backbone of global economic growth and the preservation of national competitiveness. China's manufacturing sector has presented both opportunities and difficulties for businesses undergoing digital transformation, particularly for conventional manufacturing firms whose established and reliable business model has made the shift challenging. To ensure the results were diverse and generalizable, we surveyed manufacturing firms across various industries, including machinery and steel, chemicals and petrochemicals, electronics and electrical equipment, medical devices, and biopharmaceuticals. We leveraged our connections with government agencies and business associations to assist in disseminating the questionnaire. Additionally, we conducted interviews with other business owners to verify legitimacy during this process. We piloted the questionnaire with thirty organizations to ensure objectivity and thoroughness, making minor adjustments to improve readability. Ultimately, we received 190 completed questionnaires; those with missing data or clear response patterns were excluded, resulting in 174 valid responses and a return rate of 91.5%. Table 1 provides an overview of the fundamental attributes of the companies in the sample. Overall, the sample represented a broad spectrum of business ages, types, sizes, and industrial characteristics, indicating its representativeness for the study.

Table 1: Demographic characteristics

Characteristics	Frequency	Percentage (%)
Gender		
Male	350	79.54%
Female	90	20.45%
Education		
Graduation	220	50.92%
Post-Graduation	90	20.83%
Professional Degree	60	13.88%

Any other	62	14.35%
Age		
Less than 25 years	80	19.51%
26-30 Years	90	21.95%
31-40 Years	110	26.82%
More than 40 Years	130	31.70%
Industry		
Steel	50	17.67%
Chemicals and petrochemicals	10	3.53%
Electronics and electrical equipment	20	7.06%
Medical devices	90	31.80%
Biopharmaceuticals	70	24.73%
Machinery	20	7.06%
Automobile	23	8.12%

Measurement of Variables

Most of the scales used to assess the concepts in this study were adapted from relevant literature. We employed six out of eight questions from (Ellis, 2010) to measure market orientation, using a seven-point Likert scale. For assessing organizational culture, we utilized the scale developed by (Deshpandé et al., 1993). The four culture scores were derived by summing the points allocated to the items in each category: four items for clan (A), four for adhocracy (B), four for hierarchy (C), and four for market (D). For measuring organizational leadership, we used six items from (Ulutaş, 2018). Rosin et al. (2021) assessed employees' digital capability using five items from the study.

ESG performance was evaluated using data from databases such as Thomson Reuters and a scale developed by (De Roeck & Farooq, 2018). The measure includes three components: corporate governance, environmental performance, and corporate social responsibility. Environmental performance is assessed with six criteria, including "the company uses clean energy and fuels" and "the company reduces environmentally harmful behaviors." Corporate social responsibility is measured using twelve criteria, such as "the company values the welfare of its employees" and "the company engages in long-term social welfare activities." Corporate governance is evaluated through six metrics, which include "the company has strong business ethics" and "the company has an effective information disclosure mechanism."

Results

Construct Validity Analysis

In this study, SPSS version 23 and AMOS version 16 were utilized to analyze the proposed model. The analysis included assessing data reliability, confirmatory factor analysis (CFA), convergent validity, discriminant validity, and measurement model validity. Both confirmatory and exploratory factor analyses were conducted to determine validity. Measurement scale reliability was evaluated using Cronbach's alpha (Tavakol & Dennick, 2011), with a value greater than 0.60 indicating strong internal consistency. The model fit indices reported were: $\chi^2 = 0.000$, $\chi^2/df = 1.836$, GFI = 0.876, AGFI = 0.826, RMR = 0.029, RMSEA = 0.075, NFI = 0.925, CFI = 0.964, and TLI = 0.956, based on the criteria set by (Anderson & Gerbing, 1988). According to Baum and Zerilli (2016) and Doll, Xia, and Torkzadeh (1994), GFI and AGFI values above 0.8 are considered acceptable, confirming that the model fits well. Table 2 presents the results of the construct validity analysis.

Table 2. Construct validity analysis

Fit Index	Recommended Value	Model and factors			
		Factor 1*	Factors 2**	Factors 3***	Factors 4***
χ^2	>0.05	-	0.000	0.000	0.000
χ^2/df	<2.50	-	2.348	2.380	2.450
GFI	>0.80	1.000	0.886	0.882	0.889
AGFI	>0.80	-	0.834	0.845	0.856
RMR	<0.08	0.000	0.044	0.044	0.060
RMESA	<0.08	0.357	0.096	0.090	0.097
NFI	>0.9	1.000	0.922	0.892	0.954
CFI	>0.9	1.000	0.954	0.934	0.965
TLI	>0.9	-	0.939	0.924	0.955

* Market Orientation, Organizational Leadership, Culture, Digital Capabilities and ESG Performance. ** Market Orientation + Organizational Leadership, Culture, Digital Capabilities and ESG Performance. *** Market Orientation + Organizational Leadership+ Culture, Digital Capabilities and ESG Performance. **** Market Orientation+ Organizational Leadership + Culture+ Digital Capabilities + ESG Performance.

Reliability and validity of construct

As shown in Table 3, the reliability of the scales is supported by Cronbach's alpha values, which exceed 0.70 and range from 0.877 to 0.946, indicating strong internal consistency. Additionally, the composite reliability (CR) values are all greater than 0.70. Convergent validity is established by the statistically significant standardized factor loadings for all constructs ($p < 0.000$). The model demonstrates convergent validity, as evidenced by the high construct reliability and significant factor loadings. Furthermore, the average variance extracted (AVE) values for all constructs exceed 0.60, confirming robust convergent validity for the study (Hair et al., 2010).

Table 3. Reliability and validity of construct

Construct	Dimensions	Factor loadings	CR	AVE	Cronbach's α
Market Orientation					
MO	MO1	0.623	0.939	0.760	0.930
	MO2	0.596			
	MO3	0.656			
	MO4	0.678			
	MO5	0.786			
	MO6	0.567			
	MO7	0.687			
	MO8	0.621			
Organizational Leadership					
OL	OL1	0.741	0.909	0.643	0.940
	OL2	0.745			
	OL3	0.793			
	OL4	0.816			
	OL5	0.545			
	OL6	0.621			
Organizational Culture					
OC	OC1	0.748	0.884	0.720	0.980
	OC2	0.812			
	OC3	0.839			
	OC4	0.786			
Digital Capabilities					
	DC1	0.741	0.814	0.625	0.834
	DC2	0.745			

DC	DC3	0.793			
	DC4	0.816			
	DC5	0.656			
Environmental Performance					
EP	EP1	0.765	0.848	0.752	0.854
	EP2	0.809			
	EP3	0.84			
	EP4	0.657			
	EP5	0.876			
	EP6	0.765			
Corporate Responsibility					
CR	CR1	0.741	0.856	0.765	0.865
	CR2	0.745			
	CR3	0.793			
	CR4	0.816			
	CR5	0.545			
	CR6	0.621			
	CR7	0.678			
	CR8	0.789			
	CR9	0.656			
	CR10	0.765			
	CR11	0.876			
	CR12	0.987			
Corporate Governance					
CG	CG1	0.765	0.845	0.723	0.876
	CG2	0.816			
	CG3	0.545			
	CG4	0.621			
	CG5	0.678			
	CG6	0.789			

Discriminant validity results

The model's validity is supported by the discriminant validity results presented in Table 4, which show that the average variance extracted (AVE) for each construct is greater than the squared correlations between that construct and others (Fornell, 1981). This confirms the presence of discriminant validity within our research framework. Additionally, Table 5 highlights that the diagonal elements, which represent the square roots of the AVE for each construct, are larger

than the correlations between constructs in the corresponding rows and columns. This further substantiates the discriminant validity of our model.

Table 4. Discriminant validity analysis

Variables	MO	OL	OC	DC	EP	CR	CG
MO	1.000						
OL	0.059**	1.000					
OC	0.080*	0.056**	1.000				
DC	0.208	0.090*	0.205	1.000			
EP	0.003***	0.068**	0.003***	0.275	1.000		
CR	0.074**	-0.04**	0.101*	0.084*	0.061**	1.000	
CG	0.040**	0.091*	-0.049**	0.067**	0.638	0.270	1.000

Table 5. Means, standard deviations, and correlations among variables

Variables	Mean	St.Deviation	MO	OL	Oc	DC	EP	CR	CG
MO	4.127	2.590	1.000						
OL	2.208	3.870	0.056**	1.000					
OC	3.371	2.240	0.090*	0.205	1.000				
DC	3.240	1.360	0.068**	0.003***	0.275	1.000			
EP	2.374	2.134	-0.04**	0.101*	0.084*	0.061**	1.000		
CR	3.076	3.048	0.101*	0.084*	0.061**	1.678	1.789	1.000	
CG	4.374	2.134	-0.04**	0.101*	0.084*	0.061**	0.987	0.086	1.000

Testing of the Hypotheses

To evaluate the hypotheses, we used structural equation modeling with AMOS version 16. We also applied a bootstrapping resampling technique (Hayes & Preacher, 2013) to test the theories. This approach was preferred over Baron and Kenny's method despite its more stringent criticisms (Baron & Kenny, 1986). We generated 1000 bootstrap samples, each with a bias-corrected 95% confidence interval. The acceptance or rejection of hypotheses was determined based on whether the number zero fell within the confidence interval bounds. At a 95% confidence level, if zero is within the interval, we reject the alternative hypothesis of an effect of zero.

Table 6: Structural Equation Model

Path Direction	Hypothesis	Co-efficient	P-Value	Result
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Direct Effect				
MO > DC	H1	0.361***	0.000	Accepted
MO > ESG (EP)	H2	0.473***	0.000	Accepted
MO > ESG (CR)		0.289***	0.000	Accepted
MO > ESG (CG)		0.332***	0.000	Accepted
OL > DC	H3	0.358***	0.000	Accepted
OL > ESG (EP)	H4	0.234***	0.000	Accepted
OL > ESG (CR)		0.346***	0.000	Accepted
OL > ESG (CG)		0.367***	0.000	Accepted
OC > DC	H5	0.145***	0.012	Rejected
OC > ESG (EP)	H6	0.387***	0.000	Accepted
OC > ESG (CR)		0.398***	0.000	Accepted
OC > ESG (CG)		0.280***	0.000	Accepted

Note: *** shows $P < 0.000$, ** shows $P < 0.05$

Discussion and Conclusion

This study explores the relationship between organizational leadership, organizational culture, and market orientation with regard to digital capabilities and ESG performance (including environmental performance, corporate responsibility, and corporate governance), using data from Chinese manufacturing companies. Hair, Ortinau, and Harrison (2010) recommend using PLS structural equation modeling (SEM) for such analyses, and Table 6 presents the SEM findings.

Our analysis indicates that market orientation has a direct and positive effect on digital capabilities ($\beta = 0.361$, $p < 0.000$), supporting hypothesis H1. This suggests that market orientation enhances digital capabilities, which can help firms deliver greater value to their customers (Lenka et al., 2017). We also examined the impact of market orientation on ESG performance (H2). Market orientation significantly and positively affects all three dimensions of ESG performance: environmental performance ($\beta = 0.473$, $p < 0.000$), corporate responsibility ($\beta = 0.289$, $p < 0.000$), and corporate governance ($\beta = 0.332$, $p < 0.000$), leading to the acceptance of H2.

Furthermore, organizational leadership positively influences digital capabilities ($\beta = 0.358$, $p < 0.000$), so we accept H3. Organizational leadership also significantly affects ESG performance across all dimensions: environmental performance ($\beta = 0.234$, $p < 0.000$), corporate responsibility ($\beta = 0.346$, $p < 0.000$), and corporate governance ($\beta = 0.367$, $p < 0.000$),

confirming H4. However, the effect of organizational culture on digital capabilities is negative ($\beta = -0.245$, $p < 0.000$), leading to the rejection of H5. Conversely, organizational culture has a positive and significant impact on ESG performance: environmental performance ($\beta = 0.387$, $p < 0.000$), corporate responsibility ($\beta = 0.398$, $p < 0.000$), and corporate governance ($\beta = 0.280$, $p < 0.000$), resulting in the acceptance of H6. These findings suggest that national culture helps reconcile the conflicting results from various studies on corporate governance and environmental responsibility, as discussed by (Roy et al., 2019).

The contributions of current study are as follows: First, this research will contribute to the current corpus of knowledge regarding the environmental, social, and governance (ESG) performance of manufacturing companies in industrialized nations. The majority of studies are based on secondary data from financial markets or listed businesses in industrialized nations; there is no empirical research on ESG performance that is based on primary data. This paper will employ an untested method for ESG performance research: disseminating questionnaires to Chinese manufacturing companies, in order to address this gap in the literature. The second area of inquiry for this research was the influence of corporate culture on digital skills. Third, this study provides regulators, policymakers, constituents, and academics with a more comprehensive understanding of business sustainability. Additionally, significant theoretical and practical principles are presented to facilitate the advancement of corporate sustainability.

Limitations and Future Recommendations

Although there are still certain gaps that can be filled in future studies, this work has made progress in terms of theoretical and practical implications. Firstly, the study relies solely on quantitative data collected through questionnaires, without incorporating qualitative research methods. Future studies could address this gap by using case studies to provide deeper insights. Additionally, integrating secondary data could enhance the study's rigor and comprehensiveness. Secondly, the investigation focuses exclusively on the impact of organizational leadership on ESG performance, without exploring other leadership perspectives. Future research could examine how various leadership philosophies, such as responsible and ethical leadership, influence ESG performance. Lastly, the applicability of the results is limited as the study is

confined to the manufacturing sector in China. While the findings are relevant within this context, extending the research to other industries, such as the IT sector, or to different geographic regions could provide broader insights.

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