

EXPLORING THE INTERRELATIONSHIP AMONG TRANSFORMATIONAL LEADERSHIP, DIGITAL ADVERTISING ADOPTION, E-COMMERCE ADOPTION, ENVIRONMENTAL PERFORMANCE, FINANCIAL PERFORMANCE, AND GREEN MARKETING INNOVATION: AN INVESTIGATION IN THE POST-COVID ERA

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ABSTRACT

The study aims to understand the relationship between Green Transformational Leadership, Digital Marketing Adoption, E-commerce Adoption, Environmental Performance, and Digital Marketing Innovation in the post-COVID-19 era. The study examines how these factors interact and influence each other in the current business environment. The study will explore how the COVID-19 pandemic has affected these factors and how companies have responded to the changes brought about by the pandemic. The data collect through a questionnaire from a sample size of 291 participants. The data are analyzed using Mplus 7, reputed software renowned for its effective handling of data. Later, it also uses for the investigation of the structural model. Results show that Green transformational leadership, digital advertising adoption, E-Commerce adoption, environmental Performance, Financial Performance, and green marketing innovation have significant positive impacts. Digital advertising adoption positively mediates the relationship between green transformational leadership and environmental performance. E-commerce adoption negatively mediates the relationship between green transformational leadership and environmental performance, while E-commerce adoption positively mediates the relationship between green transformational leadership and financial performance. Moreover, Green marketing innovation positively moderates the relationship between Environmental performance and financial performance, while green marketing innovation negatively moderates the relationship between e-commerce and Environmental Performance. The study will contribute to the existing literature by comprehensively understanding the nexus between Green Transformational Leadership, Digital Marketing Adoption, E-commerce Adoption, Environmental Performance, and Digital Marketing Innovation in the post-COVID-19 era. The study shows the future gap, as many other variables like green HRM practices and Green marketing knowledge can use as a moderator.

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1. INTRODUCTION

The COVID-19 pandemic has profoundly impacted the global economy and accelerated the adoption of digital technologies in many industries. This shift has created a unique opportunity for companies to embrace green transformational Leadership, digital marketing adoption, e-commerce adoption, environmental Performance, and digital marketing innovation. Green transformational leadership refers to inspiring and motivating individuals and organizations to adopt sustainable behaviors and positively contribute to the environment(Majali et al., 2022). Green transformational leadership refers to the ability of leaders to inspire and motivate their employees, stakeholders, and customers to support and implement environmentally responsible practices and technologies. By adopting green transformational leadership, companies can create a culture of sustainability that aligns with their business goals and values and complete a positive environmental impact(Singh et al., 2020). To reach and engage with customers, digital marketing adoption involves using digital technologies like social media, e-mail marketing, and search engine optimization. By adopting digital marketing strategies, companies can improve their brand visibility, reach new customers, and increase customer engagement(Öğretmenoğlu et al., 2022).

E-commerce adoption refers to integrating online platforms and technologies into a company's sales and marketing processes. By adopting e-commerce, companies can increase their reach, improve their customer experience, and reduce the environmental impact of their operations(Begum, Xia, et al., 2022). Environmental Performance refers to a company's efforts to reduce its environmental impact by implementing environmentally responsible practices and technologies. It includes reducing greenhouse gas emissions, reducing waste, and conserving resources. By improving their environmental performance, companies can demonstrate their commitment to sustainability and create a positive impact on the environment(Cahyadi et al., 2022). Digital marketing innovation refers to developing new and innovative ways to use digital technologies for marketing and communication. It includes virtual and augmented reality, artificial intelligence, and machine learning. By embracing digital marketing innovation, companies can stay ahead of the curve and remain competitive in the rapidly evolving digital landscape(Jia et al., 2018).

A company's future and current strategy rely on groundbreaking administration impact in dynamic business sectors. Representatives will identify areas of strength to foster on the off chance that pioneers have areas of power and in their vision, produce a creative image, and impart their vision clearly to the workers(Permana et al., 2022). Green groundbreaking initiatives characterize by a pioneer who energizes and inspires his partners to accomplish natural objectives that blow away what generally anticipates them according to an ecological point of view. While green execution might characterize as the presentation of programming and equipment that remember for the course of development, which an organization executes in the green cycle, and items that include modernization in advancements like the expectation of contamination, saving energy, reusing of squander, and business climate organization. Groundbreaking initiative rouses an optimal degree of motivation, confidence, robustness, affirmation, and execution(Carreiro & Oliveira, 2019). As per a few examinations, learned-driven groundbreaking initiative positively enlivened ability making due, execution organization, and capability of representatives. Green parts of green human assets on the board connect with the green viewpoint, which rehearses goals to help associations to accomplish, produce, rouse, and get through the green lead of representatives in the association(AlNuaimi et al., 2022).

By which, we gauge that to perform green execution and development, GTL has a crucial impact in concocting and rehearsing strategies that help green human asset the board to assist the firm with following up on its dreams and procedures empowering to accomplish green execution. GTL stresses workers' particular prerequisites, which urges them to create and rehearse GHRM approaches to impact their adherent's motivation and investment(Burch & Guarana, 2014). Higher firm performance is encouraged by transformational leadership, but the researchers are particularly interested in what mediators between these two dimensions are because it is still unclear. GTFL encourages staff members to learn new skills and get involved in activities connected to green processes and product innovation, enabling. Therefore, earlier studies point to the need for more research into the mechanisms linking innovations and transformative leadership (Cahyadi et al., 2022). Academics and development organizations are increasingly in agreement about the potential impact of e-commerce on human welfare. ICT and the Internet are expanding steadily in both developing and industrialized nations, in the public and corporate sectors, and domestically(Begum, Xia, et al., 2022). The transmission channel between technology and human well-being must understand to study and collect data on the role of e-commerce. Environmental Performance refers to organizational efforts to go above and beyond merely complying with laws and regulations to meet and surpass public expectations about the environment. It includes

the environmental implications of administrative operations, products, and resource use to effectively meet legal and environmental standards (Permana et al., 2022). The quality of environmentally friendly products, the creation of green processes and products, and the integration of environmental sustainability concerns into business operations and product development are all thought to have an impact on environmental performance, according to previous studies—green transformational leadership links to a strict environmental management agenda (Carreiro & Oliveira, 2019).

Furthermore, by reducing waste and costs, green product and process innovation improve the firm's financial and social performance and reduce the organization's negative environmental impact (AlNuaimi et al., 2022). According to earlier research, green innovation should not seem like a company's reactive response to stakeholder demand but rather as proactive organizational practices that improve environmental performance for competitive advantage. According to the resource-based perspective theory, green processes and product innovation are crucial corporate resources that a firm employs to improve its environmental performance and win the trust of essential stakeholders (Jia et al., 2018).

2. LITERATURE REVIEW

Theoretical Background

According to Barney's resources-based value theory (RBV), the capacity to manage a company's precious, uncommon, unique, and irreplaceable resources constitutes a competitive advantage. It encompasses organizational information, knowledge, managerial skill, and procedures (Olavarrieta & Ellinger, 1997). The most strategic resource is knowledge. As a result, a successful organization learns and produces knowledge that advances existing knowledge and results in a breakthrough. Knowledge is the outcome of interactions among people, groups, and organizational units that influences by internal and external motivating factors or empowerment that will drive the generation of new knowledge and innovations that will enable improved performance and productivity (Collins, 2021).

A company's future and current strategy rely on marketing administration's impact in dynamic business sectors. Representatives will identify areas of strength to foster on the off chance that pioneers have areas of power in their vision, produce a creative image, and impart their idea to the workers (Mishra et al., 2019). Green marketing initiative characterizes as a pioneer who energizes and inspires his partners to accomplish natural objectives that blow away what generally anticipates them according to an ecological point of view. While green execution might characterize as the presentation of programming and equipment that remember for the course of development, an organization executes in the green cycle and items that include modernization in advancements like the expectation of contamination, saving energy, reusing of squander, and business climate organization (Kohtamäki et al., 2019). Groundbreaking initiative rouses an optimal degree of motivation, confidence, robustness, affirmation, and execution. As per a few examinations, learned-driven groundbreaking initiative positively enlivened ability making due, execution organization, and capability of representatives. Green parts of green human assets the board connects with the green viewpoint, which rehearses goals to help associations to accomplish, produce, rouse, and get through the green lead of representatives in the association (Collins, 2021). By which, we gauge that to perform green execution and development, GTL has a crucial impact in concocting and rehearsing strategies that help green human asset the board to assist the firm with following up on its dreams and procedures empowering to accomplish green execution. GTL stresses workers' particular prerequisites, which urges them to create and rehearse GHRM approaches to impact their adherent's motivation and investment (Mishra et al., 2019).

H1: Green transformational leadership positively impacts Digital marketing adoption

Green Transformational leadership is a style that focuses on inspiring and motivating individuals to attain their complete capability. Studies have shown that transformational leadership may benefit e-commerce adoption, especially in groups that might be undergoing digital transformation. One examination found that transformational management behaviors positively related to e-commerce adoption intentions. The study concluded that transformational leaders could help personnel understand the blessings of e-commerce and inspire them to include new technologies and working approaches (Riva et al., 2021). Another look determined that transformational management can decorate e-trade adoption by promoting a subculture of innovation and inspiring personnel to embody alternate. The watch showed that transformational leaders had been likelier to inspire employees to strive for new technologies and experiment with new thoughts, which could lead to the successful adoption of e-trade. Moreover, transformational management can help conquer resistance to e-trade adoption by promoting a sense of shared purpose and provoking personnel to work together closer to a common goal (Begum, Ashfaq, et al., 2022). The study found that transformational leaders were more effective

at addressing employees' concerns and communicating the benefits of e-commerce adoption, which can increase employee buy-in and support for the change.

The literature review suggests that transformational leadership can positively impact e-commerce adoption. Transformational leaders can inspire and motivate employees to embrace change, promote a culture of innovation, and overcome resistance to e-commerce adoption (Huang et al., 2021). These findings highlight the importance of transformational leadership in organizations undergoing digital transformation.

H2: Green transformation leadership positively impact E-Commerce Adoption

Kusi et al. (2021) did an extensive study to demonstrate the nature of the relationship between organizational support, green transformational leadership, and company sustainability. According to the research, employees are more inclined to follow a transformational leader's advice on implementing green reformation in their job duties when the organization offers them financial and social support, as demonstrated by the leader's behavior towards the followers. Employees dedicated to the company or a transformational leaders go above and beyond to enhance the processes, product quality, and customer services in a greener way so that the company may operate sustainably. Similarly to this, Caldera et al. (2019) reported that when an organization provides adequate economic and social support to employees, green transformational leadership becomes more effective in motivating staff to work for the company's benefit while considering the green requirements of clients and state regulatory authorities. As a result, the organization can produce sustainable business performance better since it is founded on environmental and social performance and profitability (Sun et al., 2022).

H3: Green transformation leadership positively impact Environmental Performance

Digital advertising and marketing adoption refer to how businesses use digital marketing practices, such as e-mail advertising and marketing, social media advertising, and SEO. It could positively impact. Research has proven that groups adopting virtual advertising and marketing practices are likelier to have better environmental effects than those not (Y. Li et al., 2020). One look determined that virtual advertising and marketing adoption positively related to overall environmental performance in corporations. The look concluded that organizations adopting digital advertising and marketing practices are likelier to sell environmentally pleasant behaviors and talk about their commitment to sustainability to their stakeholders (Ritz et al., 2019).

Another study found that adopting digital advertising can enhance environmental performance by selling environmentally accountable products and services. The study showed that agencies undertaking digital advertising and marketing practices are more likely to attain a much broader target market and lift attention to environmentally friendly products and services, which could boom a call for and pressure innovation in this place (Qalati et al., 2021). Moreover, adopting digital advertising can help organizations reduce their carbon footprint by reducing the desire for bodily marketing and promoting paperless communication. They take a look at observe that companies that adopt digital advertising and marketing practices, along with e-mail advertising and social media advertising, are much more likely to lessen the usage of paper and power, which could affect the environment. The literature evaluation shows that digital marketing adoption can undoubtedly affect overall environmental Performance (Rahman et al., 2020). Companies undertaking digital marketing practices are likelier to sell environmentally pleasant behaviors, boost cognizance of approximately environmentally accountable products and services, and decrease their carbon footprint. These findings highlight the significance of digital advertising and marketing adoption for corporations trying to improve their environmental impact (S. A. R. Khan et al., 2020).

H4: Digital marketing adoption positively impact Environmental Performance

The allies of the advantageous nexus between internet business and natural manageability contend that transportation is one of the significant determinants of CO₂ outflows. The author claims that lessening automobile use is one capability approach to lower CO₂ discharges (Hussain et al., 2020). The internet-based commercial enterprise facilitates lead business physical games without voyaging. It might help with diminishing CO₂ emanations using permitting telecommuting and internet-based shopping, in this manner decidedly running on the climate. Conversely, allies of the lousy nexus between internet-based business and ecological excellence contended that net buying patterns expand social order because of web use (Nurlinda et al., 2020). The opportune conveyance of products is requested using customers, bringing approximately expanded fuel usage because of quicker transportation for conveyance management. This expansion in gasoline usage crumbles herbal maintainability because of developed CO₂ outflows (Hussain et al., 2022).

H5: E-Commerce adoption positively impact Environmental Performance

One study found that e-commerce adoption was positively associated with financial performance in organizations. The study concluded that e-commerce could help organizations reach a wider audience, increase

sales, and reduce costs associated with physical retail operations. Another study found that e-commerce adoption can enhance financial performance by providing organizations with new revenue streams and improving operational efficiency (Sombultawee, 2020). The take look confirmed that e-commerce systems could allow corporations to reach new markets, grow customer engagement, and automate strategies that can improve monetary consequences. Moreover, e-trade adoption can assist groups in lessening fees related to bodily retail operations, which include rent and utilities, by transferring their sales to online channels (Cassia & Magno, 2022). The observer discovered that e-trade systems could provide corporations with a cost-powerful manner to reach customers, improving economic performance.

In conclusion, the literature overview suggests that e-commerce adoption can affect financial performance. E-trade can assist agencies boom sales, lessen costs, and improve operational performance, improving monetary consequences (Hussain et al., 2020).

H6: E-Commerce adoption positively impacts Financial Performance

Explores the relationship between herbal and economical execution isn't always significant in that body of mind of breaking down healthy ways of behaving yet additionally crucial from the social gain factor of view. In monetary writing, herbal issues have usually been treated as irregularities amongst social and private benefits and have fundamentally been exceeded to government mediation to settle them (Kalyar et al., 2020). Financial execution emphatically connects with environmental execution; firms have motivating forces to decrease their natural harms. It implies that proper troubles might be settled through the marketplace system without government intercession, prompting an excellent climate for the two companies and the general public authority. The effect of natural corporate execution and penchant on financial performance has two inverse hypotheses (M. Hang et al., 2019). Typically biological theory advocates that more first-rate environmental execution extends ecological management, sporting activities, and practices, increases herbal kinds of gear speculation, advances discharge decreases potential, and bounds introduction limit. Environmental statistics divulgence may also boom the disposal value of herbal assets, related costs of ecological starting at, evaluation and spending plan, and environmental employer prices, and in a while, increment corporations' running charges (Kim et al., 2021). Climate supporting hypothesis contends that more awesome climate guarantee practices improve strength utilization talent, and a success creation approaches diminish climate-related costs and later on slant company operating gamble divulgence. In reality, herbal mishaps typically obliterate biological weather and harm citizens' properly-being (M. Hang et al., 2019). They're later joined by severely declared activities of best compensation, strictly ecological suggestions, and weather safety claims. Environmental disasters lower the future marketplace well-worth of recorded firms, damage firms' picture and recognition, and afterward affect market monetary backers' reality of destiny earnings. Typically truthful compensations and weather guarantee claims include cash surges, profits loss, and media openness. More prominent natural execution and solid inclination show that corporate strengthens systemically ecological management and forestall critical environmental mishaps or debacles, reducing political gamble, market hazard, and climate risk using herbal calamities (Lee et al., 2021). Partners' activists propose that company managers with a solid environmental penchant make moral practices or processes beautifying the extra sizeable capability for a natural presentation; partners pay a lot of attention to natural inclination and execution (M. Hang et al., 2019).

H7: Environmental Performance positively impacts Financial Performance

Green marketing specializes in a product or service's environmental and social impact and encourages organizations to undertake more sustainable practices. While leaders adopt transformational leadership styles, they can inspire and encourage their followers to obtain common dreams, along with overall environmental Performance (Cassia & Magno, 2022). The adoption of green marketing can serve as a mediator in this dating because it offers a framework for leaders to communicate their vision for an extra-sustainable future and interact with personnel in efforts to reap this aim (Cassia & Magno, 2022). Using them together, transformational leaders and green marketing can help agencies enhance their environmental performance and contribute to a sustainable destiny.

H8: Digital marketing adoption positively mediate the relationship between transformational Leadership and Environmental Performance

E-commerce can enhance the efficiency of delivery chains and decrease waste. This dating is likely to be complex and dependent on many elements, including the particular practices and technologies used within the e-commerce enterprise, the organization's size and scale, and the general goals and values (Gao et al., 2023). Transformational leadership can play a crucial position in selling e-commerce adoption. Leaders who can encourage and encourage their followers can assist in creating a lifestyle of innovation and experimentation and inspire the adoption of new technologies and approaches (Dai et al., 2022). At the same time, e-commerce can provide leaders with a powerful tool for achieving environmental performance goals by improving the

efficiency of supply chains, lowering waste, and selling the usage of different sustainable products and services (Mahdikhani & Yazdani, 2020).

H9: E-Commerce adoption positively mediate the relationship between transformational Leadership and Environmental Performance

E-commerce adoption can mediate the connection between transformational leadership and financial performance. E-commerce can doubtlessly enhance the performance and attain of a corporation's sales and distribution channels. It can help to reduce charges associated with traditional brick-and-mortar retail operations (Šaković Jovanović et al., 2020). When leaders undertake transformational management patterns, they can inspire and inspire their fans to attain a common goal, which includes overall financial performance. By promoting e-commerce adoption, transformational leaders can assist in creating a tradition of innovation and experimentation (A. N. Khan et al., 2019). They can inspire the adoption of recent technology and techniques to enhance the corporation's financial performance. Simultaneously, e-commerce affords leaders an effective device for reaching financial performance desires, increasing the attainment and efficiency of sales and distribution channels, and decreasing prices related to conventional retail operations (A. N. Khan et al., 2019). By running collectively, transformational leadership and e-commerce can help businesses to acquire financial performance goals and contribute to long-term success. It's far essential to be aware that the connection between transformational management, e-commerce adoption, and overall financial performance is possible to be complex and dependent on many factors, inclusive of the size and scale of the organization, the general goals and values of the organization, and the precise technology and practices used in e-commerce (Fonseka et al., 2021).

H10: E-Commerce adoption positively mediate the relationship between transformational leadership and financial performance

Research has proven that green digital advertising can efficiently reinforce. One reason is that virtual platforms allow companies to talk about their sustainability efforts to a broader audience and interact with clients on environmental troubles more meaningfully (Roh et al., 2022). For instance, companies can use digital technology to create more excellent environmentally friendly products, including using biodegradable substances or lowering packaging waste. They also can use virtual structures to sell those merchandise and interact with clients on environmental subjects, consisting of the impact of unmarried-use plastic on the surroundings (Zhang et al., 2021).

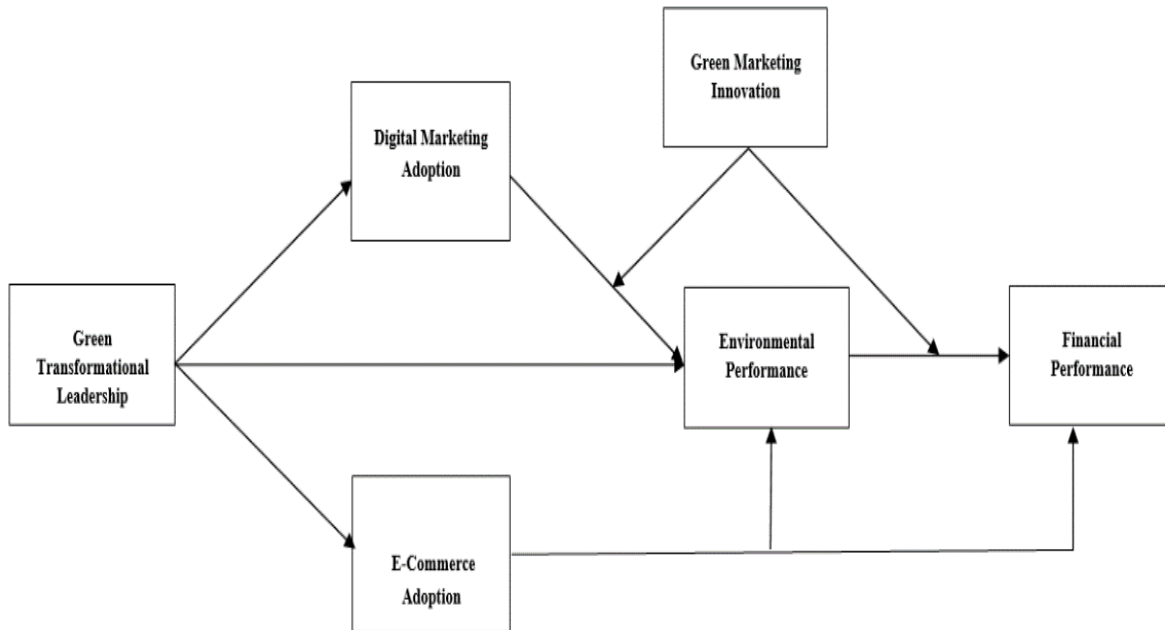
In addition, digital structures can degree and tune a company's environmental performance, permitting groups to screen and enhance their sustainability efforts through the years. It helps corporations to construct consider with their customers and to illustrate their dedication to environmental sustainability (Y. Hang et al., 2022). Typical, the literature shows that green digital advertising innovation can play a vital function in strengthening the connection between green marketing adoption and environmental performance. By leveraging the strength of virtual technologies, organizations can efficaciously communicate their sustainability efforts, interact with customers on environmental troubles, and tune and improve their environmental Performance (Zameer et al., 2021).

H11: Green marketing innovation strengthens the relationship between Digital marketing adoption and Environmental Performance

Green advertising innovation refers to integrating environmentally pleasant practices into virtual advertising strategies to improve. The concept has won considerable attention in current years as corporations aim to meet increasing customer call for sustainable products and services and reply to regulatory pressures to reduce their environmental footprint—via green virtual marketing innovation drives by way of improving customer demand for sustainable services and products (L. Li, 2022). Consumers are becoming more environmentally aware and are willing to pay a top rate for environmentally friendly merchandise. Companies imposing green virtual advertising innovation can advantage a competitive gain by differentiating their services and products, attracting environmentally aware consumers, and improving their brand reputation (Xu et al., n.d.). Companies are also responding to regulatory pressure to lessen their environmental footprint, with governments implementing policies and guidelines to inspire environmentally pleasant practices. In conclusion, the literature shows that inexperienced virtual advertising innovation can play a vital role in strengthening the relationship between environmental performance and economic Performance (Kalyar et al., 2020).

H12: Green marketing innovation strengthens the relationship between Environmental Performance and financial performance

Figure 1: Research Framework



3. RESEARCH METHODOLOGY

3.1 Population, Sampling, and Data Collection

The population of this study was the micro-, small, and medium-sized enterprises (MSMEs) operating in the industrial hubs of Pakistan, i.e., Karachi, Lahore, and Faisalabad. Faisalabad is a major city and the center of multiple large-scale manufacturing industries. Similarly, Lahore is famous for its electronics and information technology industry and well-established economic zone. Likewise, Karachi is the home of the chemical, I.T., and telecom industries. Moreover, Karachi is also known for its state-of-the-art financial services, hotel, and tourism sectors. MSMEs from these sites were selected purely because of the significant contribution these cities have made over the years to the Pakistani economy. This study applied a non-probability sampling technique. The sampling method used is purposive sampling to select respondents according to the study variables to select the respondents from the population. Notably, it also ensures that the respondent organizations use digital platforms like TikTok, Instagram, etc., to interact with their existing and potential customers.

Importantly, we purposely selected the respondents, approached them randomly, and explained the study's objectives to determine their willingness to participate. A well-structured questionnaire was distributed to the respondents based on their initial confirmation and desire to participate. The questionnaire consisted of two sections, and the first section had items related to the use of social media, like TikTok, industry type, and organization type. The second section asked questions about the main variables of the study (transformational leadership, digital marketing adoption, e-commerce adoption, environmental Performance, Financial Performance, and green marketing innovation). Two hundred ninety-one respondents shared the information about the research variables and filled out the questionnaire.

3.2 Measures

We designed a survey questionnaire that consisted of six variables, namely; (transformational leadership, digital marketing adoption, e-commerce adoption, environmental Performance, Financial Performance, and green marketing innovation). Notably, the instrument consisted of 31 questions adapted from previous research. We borrowed six items to measure transformational leadership (García-Morales et al., 2012), seven items for e-commerce adoption (Gibbs & Kraemer, 2004), five items for digital marketing adoption (Ritz et al., 2019), five items for environmental Performance (Chow & Chen, 2012), four items of financial Performance (Agyabeng-Mensah et al., 2020) and four items of green marketing innovation (Kanan et al., 2023). Furthermore, all items evaluate using a seven-point Likert scale (1= Strongly Disagree to 7= Strongly Agree), where the respondents ask to score the extent to which their organizations use the mentioned practices.

4. DATA ANALYSIS

The research framework of this study is composed of six key factors, namely, "green transformational leadership", "financial performance and environmental performance," "digital marketing adoption," "e-commerce adoption," and "green marketing innovation." But before examining the hypotheses, first, we conducted confirmatory factor analysis (CFA) to assess the fit indices and model quality. Indeed, CFA helped evaluate the convergent, discriminant validity of the variables involved in this study and guided the examination of the structural model. For this purpose, we utilized Mplus 7, a reputed software renowned for its effective data handling. Later, it also investigates the structural model (Barbeau et al., 2019).

4.1 Model Fitness, Validity, and Reliability

The variables were assigned abbreviated codes before proceeding with the analysis to adhere to the specific requirements of the software. The variables "green transformational leadership," "financial performance," "environmental performance," "digital marketing adoption," "e-commerce adoption," and "green marketing innovation" were shortened to "GTFL," "F.P.," "DAA," "ECA," and "GMI," respectively.

As a part of the process, the measurement quality and model fitness of the research framework assesses before testing the hypotheses. Therefore, to determine the measurement quality, we examined the manifest variables' internal consistency and validity by calculating the measurement model's convergent and discriminant validity (Thien, 2019). We applied the famous criteria of Hu and Bentler (1999) to interpret these results. Similarly, the model fitness decision basis on the values of chi-square, SRMR, RMSEA, CFI, and TLI(Kline, 2011)provided in Mplus output (Muthén & Asparouhov, 2012). The fit indices of the model, as shown in Table 1, were more significant than the maximum cutoff values, indicating that the model was suitable for testing the hypotheses (Hu & Bentler, 2009).

Figure 2: Measurement Model

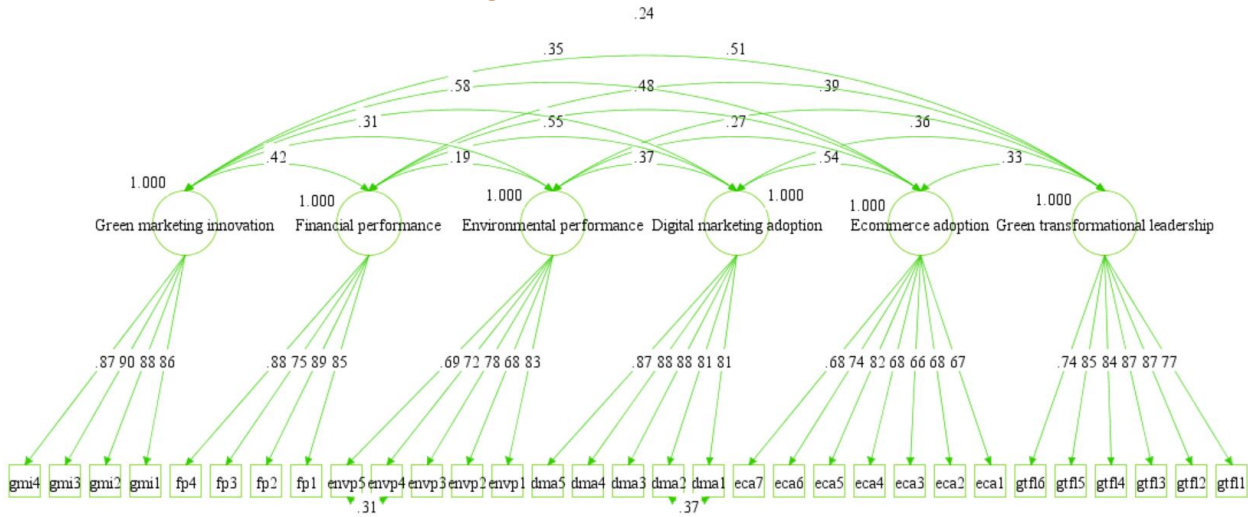


Table 1: Model Fitness

Measurement Model	X ²	DF	X ² /DF	CFI	TLI	RMSEA	SRMR
1	845.772	417	2.028	0.933	0.926	0.059	0.047

Note: n=291, X2 = Chi-square value, DF =Degree of freedom

4.2 Tests for Common Method Bias

It was crucial to examine the possible randomness of the relationship between the variables to ensure the accuracy and reliability of the data collected through the survey questionnaire (Podsakoff et al., 1990). Therefore, Harman's single-factor method was applied to determine if there was any bias in the connection between the variables. The common method bias (CMB) test results showed that the single factor only explained 33.829 % of the variance, as demonstrated in Table 2. However, according to the guidelines, if the results show that one factor accounts for less than 50% of the variance, the relationship between the variables can be considered valid (Sarlis & Gallhofer, 2014). Hence, it confirms that the relationship between variables was neither biased nor artificially inflated.

Table 2: Common Method Bias

Factor	Initial Eigen Values			Extraction Sums of Squared Loadings		
	Total	Variance	Cumulative	Total	Variance	Cumulative
1	10.487	33.829%	33.829%	10.487	33.829%	33.829%

Note: Variance = Variance explained, Cumulative= Cumulative variance explained

4.3 Validity, Reliability, and Descriptive Statistics

Additionally, the measurement model of the research relied on various metrics, such as factor loadings, convergent validity, discriminant validity, and reliability, to assess its quality. The SQRT of AVE compare to the corresponding correlation values, and the importance of SQRT of AVE was higher, implying that there was no risk of discriminant validity to confirm the discriminant validity of the constructs (Whittaker, 2011). The convergent validity assesses using standardized factor loadings & AVE, and it concluded that the scale's convergent validity was not an issue because all the values satisfied the recommended criteria (Farrell, 2010; Fornell & Larcker, 1981; Suárez-Albanchez et al., 2021). In this case, AVE was more significant than 0.5, and the standardized loadings of each measurement item were more critical than 0.6(Hair, 2009; Memon & Rahman, 2014) Similarly, the scale's reliability also confirms by calculating the composite reliability. It established that the constructs had a combined reliability value higher than 0.7, with a maximum weight of 0.931 for GMI and a minimum value of 0.859 for ENVP. Furthermore, Table 3 also satisfies the concerns for multi-collinearity and confirmed that the strength of correlations between the variables remained far lesser than 0.90, indicating that there was never an issue of multi-collinearity (Midi et al., 2010).

Finally, Table 3 also provides information about the normality of the data and highlights that the highest MEAN value (6.320) corresponds to GMI. In contrast, the lowest value (4.95) corresponds to the independent variable "TIGE," respectively. Similarly, the highest standard deviation was associated with the DV (RIN), whereas the lowest value (4.956) represented the GTFL. Likewise, the values of S.D ranged between 1.01 to .713. These values reaffirmed the assumption about the normality of the data and signaled that the data was perfectly suitable for hypothesis testing by applying Mplus (Muthén & Asparouhov, 2012).

Table 3: Descriptive Statistics, Correlation, and Discriminant Validity

Construct	GTFL	DAA	ECA	ENVP	FP	GMI
GTFL	.823					
DAA	.361**	.849				
ECA	.325**	.540**	.705			
ENVP	.385**	.367**	.268**	.742		
F.P.	.505**	.545**	.478**	.186**	.844	
GMI	.243**	.579**	.355**	.311**	.417**	.878
Mean	4.956	5.881	5.652	5.943	5.243	6.320
S.D.	1.010	.949	.713	.784	1.221	.932
C.R.	.927	.928	.874	.859	.908	.931
AVE	.68	.72	.50	.55	.71	.77

Note: n=291, S. D= Standard deviation, , GMI = Green marketing innovation, DAA = Digital marketing adoption, ENVP = Environmental Performance, FP= Financial performance, ECA=E-commerce adoption, GTFL=Green transformational leadership, CR= Composite reliability, AVE= Average variance extracted.

4.4 Hypothesis Testing

We first examined the direct hypothesis between the variables of the study. There were seven direct paths between different variables (green transformation leadership, digital marketing adoption, e-commerce adoption, environmental Performance, Financial Performance, and green marketing innovation), as depicted in Figure 1. The findings of the direct paths highlight in Table 4. As stated, the first hypothesis (H1) was about the relationship between GTFL and DAA. The results showed that GTFL positively and significantly affected DAA, with β -value=0.359, SE=0.056, T-value= 6.461, and a P-value of 0.000. It means that H1 supports GTFL significantly and positively predicts DAA. Similarly, the second hypothesis (H2) results showed a positive and significant relationship between GTFL and ECA, with a β -value= 0.326, SE=0.059, T-value= 5.562, and a P-value=0.000. Thus, H2 was supported. It indicated that GTFL had a positive relationship with

the ECA. Likewise, the results for H3 revealed a positive and significant association between GTFL and ENVP, with β -value=0.395, SE=0.056, T-value=7.027, and a P-value=0.000. Therefore, our claim about H3 support. Furthermore, H4 investigated the link between one of the mediating variables, "DAA," and ENVP. Data analysis confirmed that DAA predicts ENVP because of its β -value= 0.358, SE=0.058, T-value=6.158, and P-value=0.000. Therefore, H4 was supported. Similarly, H5 examined the relationship between another mediating variable of the study, "ECA" and ENVP. The result highlighted a causal link between the variables as the values stood as β =0.278, SE=0.063, T-value=4.436, and P-value=0.000, respectively—the last two hypotheses aimed to investigate the effect of ECA and ENVP on F.P. respectively. Data analysis proved the significant association between the ECA and F.P. with a β -value=0.479, SE=0.052, T-value=9.179 and P-value=0.000, and ENVP and F.P. with a β -value=0.187, SE= 0.064, T-value=2.929, P-value=0.003 respectively. These findings supported our claims about H6 & H7 (see Table 4).

Table 4: Hypothesis Testing for Direct Effects

Hypotheses	B	SE	T-Value	P-Value	Outcomes
H1: GTFL---DAA	0.359	0.056	6.461	0.000	Supported
H2: GTFL---ECA	0.326	0.059	5.562	0.000	Supported
H3: GTFL---ENVP	0.395	0.056	7.027	0.000	Supported
H4: DAA---ENVP	0.358	0.058	6.158	0.000	Supported
H5: ECA---ENVP	0.278	0.063	4.436	0.000	Supported
H6: ECA---FP	0.479	0.052	9.179	0.000	Supported
H7: ENVP---FP	0.187	0.064	2.929	0.003	Supported

Note: Note: β = STDYX, SE= Standard error, DAA = Digital marketing adoption, ENVP = Environmental performance, FP= Financial Performance, ECA=E-commerce adoption, GTFL=Green transformational leadership.

Table 5: Hypothesis Testing for Indirect Effects

Hypotheses	β (SIE)	SE	T-Value	95% CI	P-Value	Outcomes
H8: GTFL-DAA-ENVP	0.094	0.032	2.908	0.041—0.148	0.004	Supported
H9: GTFL-ECA-ENVP	0.052	0.029	1.823	0.005—0.099	0.068	Not Supported
H10: GTFL-ECA-FP	0.114	0.030	3.833	0.070—0.158	0.000	Supported

Note: β = STDYX, SIE= Specific indirect effect, SE= Standard error, CI= Confidence interval, DAA = Digital marketing adoption, ENVP = Environmental performance, FP= Financial performance, ECA=E-commerce, Adoption, GTFL=Green transformational leadership.

Table 5 contains information about mediated paths of the structural model. However, for testing the mediation hypothesis, we applied 1000-bootstrap for extracting trustworthy confidence intervals and for confirming the significance of the results (Cui et al., 2022). Accordingly, H8 hypothesized that DAA would mediate the relationship between GTFL and ENVP. The results highlighted that the direct effect between GTFL and ENVP was also subject to the existence of DAA. Therefore, mediation of DAA proved to be significant with β -value of SIE= 0.094, SE=0.032, T-value=2.908, and P-value=0.004. Additionally, the 95% CI was also positive and the upper and lower values of CI did not include zero (Shrout & Bolger, 2002). These findings confirmed that H8 was supported. Likewise, the mediating effect of the second mediating variable also investigates in H9. It assumes that ECA will significantly link the GTFL and ENVP. But contrary to the expectation, the assumption did not hold as the indirect path proved insignificant, and its STDYX remained

0.052, with SE=0.029, T-value=1.823 and P-value of 0.068. Even though the 95% CI of upper and lower values did not go through zero and was reported as 0.005---0.099. Therefore, H9 was not supported. Furthermore, in H10, we predicted that ECA would mediate the effect of GTFL on F.P. As per the expectations, result demonstrated that ECA significantly mediated the effect $STDYX = 0.114$, $SE = 0.030$, $T\text{-value} = 3.833$ and $P\text{-value} = 0.00$. Moreover, its 95% confidence intervals also remained positive i.e. 0.070---0.158 and did not include contrasting values. Therefore, H10 was supported.

Table 5 contains information about mediated paths of the structural model. However, for testing the mediation hypothesis, we applied 1000-bootstrap for extracting trustworthy confidence intervals and for confirming the significance of the results (Cui et al., 2022). Accordingly, H8 hypothesized that DAA would mediate the relationship between GTFL and ENVP. The results highlighted that the direct effect between GTFL and ENVP was also subject to the existence of DAA. Therefore, mediation of DAA proved to be significant with $\beta\text{-value} = 0.094$, $SE = 0.032$, $T\text{-value} = 2.908$, and $P\text{-value} = 0.004$. Additionally, the 95% CI was also positive and the upper and lower values of CI did not include zero (Shrout & Bolger, 2002). These findings confirmed that H8 was supported. Likewise, the mediating effect of the second mediating variable also investigates in H9. It assumes that ECA will significantly link the GTFL and ENVP. But contrary to the expectation, the assumption did not hold as the indirect path proved insignificant, and its $STDYX$ remained 0.052, with $SE = 0.029$, $T\text{-value} = 1.823$ and $P\text{-value} = 0.068$. Even though the 95% CI of upper and lower values did not go through zero and was reported as 0.005---0.099. Therefore, H9 was not supported. Furthermore, in H10, we predicted that ECA would mediate the effect of GTFL on F.P. As per the expectations, result demonstrated that ECA significantly mediated the effect $STDYX = 0.114$, $SE = 0.030$, $T\text{-value} = 3.833$ and $P\text{-value} = 0.00$. Moreover, its 95% confidence intervals also remained positive i.e. 0.070---0.158 and did not include contrasting values. Therefore, H10 was supported.

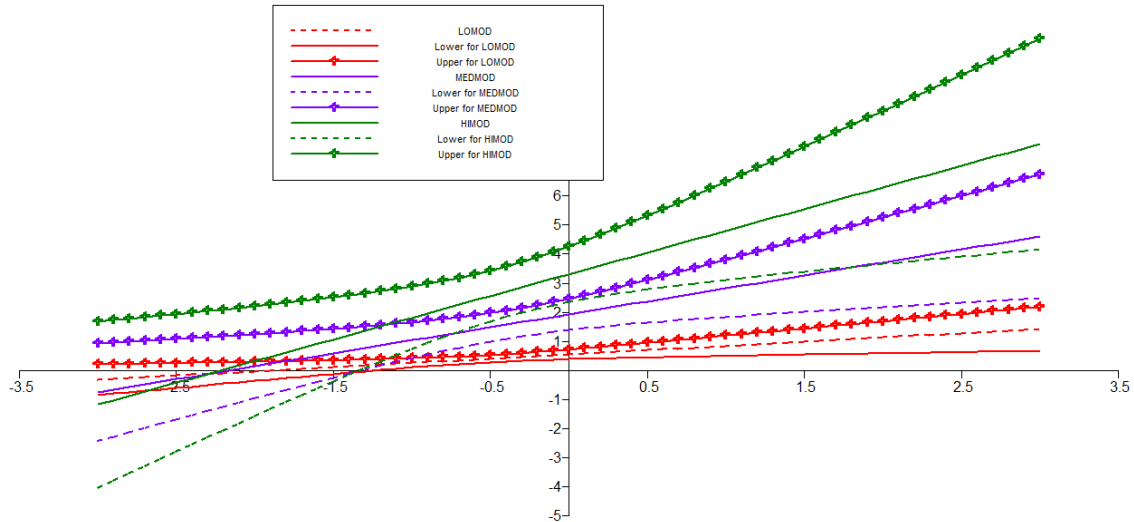
Table 6: Moderation Analysis

Hypotheses	B	SE	T-Value	P-Value	95% CI	Outcomes
H11: The moderating role of GMI on the DAA-ENVP relationship	0.061	0.071	0.865	0.387	-.055---.177	Not Supported
H12: The moderating role of GMI on the ENVP-FP relationship	0.200	0.074	2.713	0.007	0.079---0.322	Supported

Note: $\beta = STDYX$, $SE =$ Standard error, $CI =$ Confidence interval $GMI =$ Green marketing innovation, $DAA =$ Digital marketing adoption, $ENVP =$ Environmental performance, $FP =$ Financial performance

Finally, as per the research objectives, we analyzed the moderating effect of GMI first on the DAA-ENVP path and later on the ENVP-FP path. As far as H11 was concerned, it emphasized examining the conditional impact of GMI on the DAA-ENVP path. The moderation effect of the interaction term ($DAA * GMI$) was highly insignificant with $STDYX = 0.061$, $SE = 0.071$, $T\text{-value} = 0.865$, and a $P\text{-value} = 0.387$. This insignificant moderating effect was further confirmed by the 95% CI of the effect, including contrasting values, i.e. [-.055---.177]. Against the assumptions of the theory, H11 does not support it. However, H12 examined the moderating effect between ENVP and F.P. The analysis revealed that the $GM * ENVP$ have a combined impact on F.P., and this effect was positive and significant, i.e., $STDYX = 0.200$, $SE = 0.074$, $T\text{-value} = 2.713$ and a $P\text{-value} = 0.007$. Additionally, this significant moderation further supports by the positive values of upper and lower values of 95% CI (0.079---0.322). Therefore, our claim about H12 supports by the data.

Figure 3: Loop plot for the moderation of GMI on ENVP-FP



In the end, just because the results of H12 proved that GMI significantly moderated the positive relationship of ENVP and F.P., carried out a simple slope analysis to confirm whether the moderating effect is different at low, medium, and high values of GMI. It establishes that the moderation effect was more pronounced at higher values of GMI than its lower values (See Figure 3).

5. DISCUSSION

We first examined the direct hypothesis between the variables of the study. There were seven direct paths between different variables (green transformation leadership, digital marketing adoption, e-commerce adoption, environmental Performance, financial Performance and green marketing innovation). The findings of the direct paths are as the first hypothesis (H1) was about the relationship between Green transformational leadership and digital advertising adoption. The results showed that GTFL positively and significantly affected DAA. It means that H1 supports GTFL significantly and positively predicts DAA.

Similarly, the results for the second hypothesis (H2) showed a positive and significant relationship between GTFL and E-commerce adoption. Thus, H2 was supported. It indicated that GTFL had a positive relationship with the ECA. Likewise, the results for H3 revealed a positive and significant association between GTFL and Environmental performance, therefore, our claim about H3 supports. Furthermore, H4 investigated the link between one of the mediating variables, "DAA," and ENVP. Therefore, H4 was supported. Similarly, H5 examined the relationship between another mediating variable of the study, "ECA" and ENVP—the last two hypotheses aimed to investigate the effect of ECA and ENVP on F.P., respectively. Data analysis proved the significant association between the ECA and F.P. These findings supported our claims about H6 & H7.

Now we will discuss the mediation variables. Accordingly, H8 hypothesized that DAA would mediate the relationship between GTFL and ENVP. The results highlighted that the direct effect between GTFL and ENVP was also subject to the existence of DAA. Therefore, DAA's mediation proved significant and showed a positive impact. These findings confirmed that H8 was supported. Likewise, the mediating effect of the second mediating variable also investigates in H9. It assumes that ECA will significantly link the GTFL and ENVP.

But contrary to the expectation, the assumption did not hold as the indirect path proved insignificant. Therefore, H9 was not supported. Furthermore, in H10, we predicted that ECA would mediate the effect of GTFL on F.P. As per the expectations; the result demonstrated that ECA significantly mediated the effect. Therefore, H10 was supported.

Finally, as per the research objectives, we will discuss the moderating effect of GMI first on the DAA-ENVP path and later on the ENVP-FP path. As far as H11 was concerned, it emphasized examining the conditional impact of GMI on the DAA-ENVP path. It finds out that the moderation effect of the interaction term (DAA*GMI) was highly insignificant. Against the assumptions of the theory, H11 does not support it. However, H12 examined the moderating effect between ENVP and F.P. The analysis revealed that the GM*ENVP has a combined impact on FP, which was positive and significant. Therefore, our claim about H12 supports by the data for the duration of the Coronavirus pandemic, the web-based enterprise assumed a part in giving admittance to opportune gadgets, on which intense obstacles pressure to protect people's well-being.

6. CONCLUSION

Resultantly, high-quality improvement became information about the merchandise provider, yet a tremendous misfortune befell in the tour enterprise due to lockdown strategies. Natural protection consumption as a Gross home product degree stays stable throughout the length. An association has supported surroundings regulation and offers to prevent CO2 now not set in stone to be environment unbiased until 2050. The problem of the contamination may fix via the internet enterprise. All direct variables have an acceptable impact, but after evaluation, we find that the E-commerce adoption has negatively mediated the connection between transformational management and overall environmental performance. Another hypothesis is that inexperienced virtual advertising innovation does not toughen the relationship between green advertising adoption and Environmental Performance.

Interestingly, this exam offers observational research concerning the effect of net business on ecological supportability goals. The task of e-buying in financial improvement investigates in some studies. Notwithstanding, internet-based totally enterprise's impact on natural supportability has never observationally investigate. Consequently, to satisfy this vacuum, the drift research looks at the effects of web-primarily based commercial enterprise on ecological supportability and focuses on account of chosen economies. These economies pick because of facts and accessibility. For an in-depth examination, the evaluation embraces three excellent relapse strategies. Likewise, The Listen uses a broad quantile for deriving web-primarily based commercial enterprises that affect ecological maintainability objectives.

7. IMPLICATIONS

Theoretical Implications

The theoretical implications of the take look at the nexus of Transformational green management, digital marketing Adoption, E-commerce Adoption, Environmental Performance, and digital advertising Innovation within the post-COVID-19 technology could explore how the findings of the research make contributions to the existing body of know-how inside the field of control and sustainability (Mahdikhani & Yazdani, 2020). The study will all likely deepen our expertise of how green transformational management impacts e-commerce and virtual advertising and marketing adoption and how it enhances environmental performance and spurs virtual advertising innovation. The examiner will likely also upload the information frame on the relationship between environmental performance and digital advertising usage, emphasizing the significance of corporations utilizing virtual platforms and eras to raise their sustainability and competitiveness (Mahdikhani & Yazdani, 2020).

The study would advance our knowledge of how innovation shapes the business environment in the post-COVID-19 era in terms of digital marketing innovation, and it would offer insights into the actions that businesses can take to stay competitive and sustainable in the current business environment. Overall, the study's theoretical ramifications would improve our comprehension of the relationship between green transformational leadership, digital marketing adoption, e-commerce adoption, environmental performance, and digital marketing innovation in the post-COVID-19 era and serve as a foundation for additional research in this field.

Policy Implications

The field of data innovation should expand as it incorporates knowledge about the use of the Internet for business, human growth, and green development. The legislators of the economies that make up the European Association should encourage the development of mechanical skills among their citizens since doing so will help them learn how to protect themselves from the negative effects of online commerce. The analysis concluded that lawmakers should assist in developing an Internet business plan. The responsibility for educating the people about the benefits and conveniences of online trade falls on higher authorities and state-run organizations. States should continue to explore how a reliable online company satisfies the needs of every person. The Internet business sector should be helpful because it directly affects many societal issues, such as transportation, traffic, and environmental assurance. The government could promote online shopping by establishing ICT exchange rules and limiting imported goods with excessive energy consumption. Policymakers can encourage the expansion of green arrangements by simplifying requirements on the financial cost of eco-accommodating activities and innovations.

Future Direction

Future studies should look into the implications of Internet commerce for energy use. ICT development is necessary for the successful operation of online business applications. The role of ICT should take into account in the tests that follow. Given the review's findings, future research would focus on the intersection of Green Groundbreaking Authority, Computerized Showcasing Reception, Online business Reception, Ecological

Execution, and Advanced Promoting Development in the post-Coronavirus era. Future research could also examine the relationship between groundbreaking green authorities, advanced showcasing reception, web-based business reception, ecological execution, and computerized promotional development in the post-Coronavirus era. Future research might also focus on consumer behavior's role in influencing the relationships between these five criteria and how organizations can better understand and serve customers' demands for manageability and growth. Last, future research could look into how emerging technologies, such as artificial intelligence and the Internet of Things, affect groundbreaking green management, computerized advertising reception, web-based business reception, ecological execution, and advanced promoting development connect in the post-Coronavirus period.

Limitations

In the post-Coronavirus era, there are certain limitations to focusing on the intersection of Green Administration, Computerized Promoting Reception, Web-based Company Reception, Natural Execution, and Advanced Showcasing Development. The review will probably be unable to explain the rational reasons for and connections between the post-Coronavirus period and the Green Groundbreaking Initiative, Computerized Showcasing Reception, Online Business Reception, Natural Execution, and Computerized Promoting Development. Despite these limitations, the analysis provides substantial insight into the post-Coronavirus nexus of Green Groundbreaking Administration, Computerized Showcasing Reception, Web-based company Reception, Natural Execution, and Advanced Advertising Development. It will shed light on any upcoming tests in this area.

References

1. AlNuaimi, B. K., Singh, S. K., Ren, S., Budhwar, P., & Vorobyev, D. (2022). Mastering digital transformation: The nexus between leadership, agility, and digital strategy. *Journal of Business Research*, 145, 636–648.
2. Begum, S., Ashfaq, M., Xia, E., & Awan, U. (2022). Does green transformational leadership lead to green innovation? The role of green thinking and creative process engagement. *Business Strategy and the Environment*, 31(1), 580–597.
3. Begum, S., Xia, E., Ali, F., Awan, U., & Ashfaq, M. (2022). Achieving green product and process innovation through green leadership and creative engagement in manufacturing. *Journal of Manufacturing Technology Management*, 33(4), 656–674.
4. Burch, T. C., & Guarana, C. L. (2014). The comparative influences of transformational leadership and leader-member exchange on follower engagement. *Journal of Leadership Studies*, 8(3), 6–25.
5. Cahyadi, A., Natalisa, D., Poór, J., Perizade, B., & Szabó, K. (2022). Predicting the Relationship between Green Transformational Leadership, Green Human Resource Management Practices, and Employees' Green Behavior. *Administrative Sciences*, 13(1), 5.
6. Carreiro, H., & Oliveira, T. (2019). Impact of transformational leadership on the diffusion of innovation in firms: Application to mobile cloud computing. *Computers in Industry*, 107, 104–113.
7. Cassia, F., & Magno, F. (2022). Cross-border e-commerce as a foreign market entry mode among SMEs: the relationship between export capabilities and performance. *Review of International Business and Strategy*, 32(2), 267–283.
8. Collins, C. J. (2021). Expanding the resource based view model of strategic human resource management. *The International Journal of Human Resource Management*, 32(2), 331–358.
9. Dai, Y., Abdul-Samad, Z., Chupradit, S., Nassani, A. A., Haffar, M., & Michel, M. (2022). Influence of CSR and leadership style on sustainable performance: moderating impact of sustainable entrepreneurship and mediating role of organizational commitment. *Economic Research-Ekonomska Istraživanja*, 35(1), 3917–3939.
10. Fonseka, K., Jaharadak, A. A., Raman, M., & Tham, J. (2021). Determinants affecting the adoption of E-commerce and its impact on organisational Performance of SMEs in Sri Lanka. *Journal of Telecommunications and the Digital Economy*, 9(4), 23–43.
11. Gao, J., Siddik, A. B., Khawar Abbas, S., Hamayun, M., Masukujjaman, M., & Alam, S. S. (2023). Impact of E-Commerce and Digital Marketing Adoption on the Financial and Sustainability Performance of MSMEs during the COVID-19 Pandemic: An Empirical Study. *Sustainability*, 15(2), 1594.
12. Hang, M., Geyer-Klingeborg, J., & Rathgeber, A. W. (2019). It is merely a matter of time: A meta-analysis of the causality between environmental performance and financial performance. *Business Strategy and the Environment*, 28(2), 257–273.
13. Hang, Y., Sarfraz, M., Khalid, R., Ozturk, I., & Tariq, J. (2022). Does corporate social responsibility and green product innovation boost organizational performance? a moderated mediation model of competitive advantage and green trust. *Economic Research-Ekonomska Istraživanja*, 35(1), 5379–5399.

14. Huang, S. Y. B., Ting, C.-W., & Li, M.-W. (2021). The effects of green transformational leadership on adoption of environmentally proactive strategies: The mediating role of green engagement. *Sustainability*, 13(6), 3366.
15. Hussain, A., Akbar, M., Shahzad, A., Poulouva, P., Akbar, A., & Hassan, R. (2022). E-commerce and SME performance: The moderating influence of entrepreneurial competencies. *Administrative Sciences*, 12(1), 13.
16. Hussain, A., Shahzad, A., & Hassan, R. (2020). Organizational and environmental factors with the mediating role of e-commerce and SME performance. *Journal of Open Innovation: Technology, Market, and Complexity*, 6(4), 196.
17. Jia, J., Liu, H., Chin, T., & Hu, D. (2018). The continuous mediating effects of GHRM on employees' green passion via transformational leadership and green creativity. *Sustainability*, 10(9), 3237.
18. Kalyar, M. N., Shoukat, A., & Shafique, I. (2020). Enhancing firms' environmental performance and financial performance through green supply chain management practices and institutional pressures. *Sustainability Accounting, Management and Policy Journal*, 11(2), 451–476.
19. Khan, A. N., Ali, A., Khan, N. A., & Jehan, N. (2019). A study of relationship between transformational leadership and task performance: The role of social media and affective organisational commitment. *International Journal of Business Information Systems*, 31(4), 499–516.
20. Khan, S. A. R., Zhang, Y., Kumar, A., Zavadskas, E., & Streimikiene, D. (2020). Measuring the impact of renewable energy, public health expenditure, logistics, and environmental performance on sustainable economic growth. *Sustainable Development*, 28(4), 833–843.
21. Kim, S., Terlaak, A., & Potoski, M. (2021). Corporate sustainability and financial performance: Collective reputation as moderator of the relationship between environmental performance and firm market value. *Business Strategy and the Environment*, 30(4), 1689–1701.
22. Kohtamäki, M., Parida, V., Oghazi, P., Gebauer, H., & Baines, T. (2019). Digital servitization business models in ecosystems: A theory of the firm. *Journal of Business Research*, 104, 380–392.
23. Lee, A. S., Ong, T. S., Mohd Said, R., Senik, R., & Teh, B. H. (2021). Strategic management for superior environmental and financial performance in Malaysian manufacturing firms. *Journal of Sustainability Science and Management*, 16(6), 274–291.
24. Li, L. (2022). Digital transformation and sustainable Performance: The moderating role of market turbulence. *Industrial Marketing Management*, 104, 28–37.
25. Li, Y., Dai, J., & Cui, L. (2020). The impact of digital technologies on economic and environmental performance in the context of industry 4.0: A moderated mediation model. *International Journal of Production Economics*, 229, 107777.
26. Mahdikhani, M., & Yazdani, B. (2020). Transformational leadership and service quality in e-commerce businesses: The role of trust and team performance. *International Journal of Law and Management*, 62(1), 23–46.
27. Majali, T., Alkaraki, M., Asad, M., Aladwan, N., & Aledeinat, M. (2022). Green Transformational Leadership, Green Entrepreneurial Orientation and Performance of SMEs: The Mediating Role of Green Product Innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(4), 191.
28. Mishra, D., Luo, Z., Hazen, B., Hassini, E., & Foropon, C. (2019). Organizational capabilities that enable big data and predictive analytics diffusion and organizational Performance: A resource-based perspective. *Management Decision*, 57(8), 1734–1755.
29. Nurlinda, N., Napitupulu, I., Wardayani, W., Azlina, A., Andina, A., Ulfah, A., & Supriyanto, S. (2020). Can E-Commerce Adoption Improve SME's Performance?(Case Studies on Micro, Small and Medium Enterprises with Gojek Services in Indonesia). *Proceedings of the Third Workshop on Multidisciplinary and Its Applications, WMA-3 2019, 11-14 December 2019, Medan, Indonesia*.
30. Öğretmenoğlu, M., Akova, O., & Göktepe, S. (2022). The mediating effects of green organizational citizenship on the relationship between green transformational leadership and green creativity: Evidence from hotels. *Journal of Hospitality and Tourism Insights*, 5(4), 734–751.
31. Olavarrieta, S., & Ellinger, A. E. (1997). Resource-based theory and strategic logistics research. *International Journal of Physical Distribution & Logistics Management*.
32. Permana, E., Santoso, R., Murdani, & Purwoko, B. (2022). Building Culinary Business Performance during the Covid-19 Pandemic: Transformational Leadership as a Trigger through Digital Capabilities. *Journal of Culinary Science & Technology*, 1–21.
33. Qalati, S. A., Yuan, L. W., Khan, M. A. S., & Anwar, F. (2021). A mediated model on the adoption of social media and SMEs' Performance in developing countries. *Technology in Society*, 64, 101513.
34. Rahman, M., Aziz, S., & Hughes, M. (2020). The product-market performance benefits of environmental policy: Why customer awareness and firm innovativeness matter. *Business Strategy and the Environment*, 29(5), 2001–2018.

35. Ritz, W., Wolf, M., & McQuitty, S. (2019). Digital marketing adoption and success for small businesses: The application of the do-it-yourself and technology acceptance models. *Journal of Research in Interactive Marketing*, 13(2), 179–203.
36. Riva, F., Magrizos, S., & Rubel, M. R. B. (2021). Investigating the link between managers' green knowledge and leadership style, and their firms' environmental Performance: The mediation role of green creativity. *Business Strategy and the Environment*, 30(7), 3228–3240.
37. Roh, T., Noh, J., Oh, Y., & Park, K.-S. (2022). Structural relationships of a firm's green strategies for environmental Performance: The roles of green supply chain management and green marketing innovation. *Journal of Cleaner Production*, 356, 131877.
38. Šaković Jovanović, J., Vujadinović, R., Mitreva, E., Fragassa, C., & Vujović, A. (2020). The relationship between E-commerce and firm Performance: The mediating role of internet sales channels. *Sustainability*, 12(17), 6993.
39. Singh, S. K., Del Giudice, M., Chierici, R., & Graziano, D. (2020). Green innovation and environmental Performance: The role of green transformational leadership and green human resource management. *Technological Forecasting and Social Change*, 150, 119762.
40. Sombultawee, K. (2020). Antecedents and consequences of e-commerce adoption for SMEs. *Kasetsart Journal of Social Sciences*, 41(2), 256–261.
41. Sun, X., El Askary, A., Meo, M. S., Zafar, N. ul A., & Hussain, B. (2022). Green transformational leadership and environmental performance in small and medium enterprises. *Economic Research-Ekonomska Istraživanja*, 35(1), 5273–5291.
42. Xu, Q., Li, X., & Guo, F. (n.d.). Digital transformation and environmental Performance: Evidence from Chinese resource-based enterprises. *Corporate Social Responsibility and Environmental Management*.
43. Zameer, H., Wang, Y., Vasbieva, D. G., & Abbas, Q. (2021). Exploring a pathway to carbon neutrality via reinforcing environmental performance through green process innovation, environmental orientation and green competitive advantage. *Journal of Environmental Management*, 296, 113383.
44. Zhang, M., Zeng, W., Tse, Y. K., Wang, Y., & Smart, P. (2021). Examining the antecedents and consequences of green product innovation. *Industrial Marketing Management*, 93, 413–427.