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Sustainable Business Transformation through Green Innovation: Managerial Practices, Challenges, and Outcomes

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Abstract

The research centers on sustainable business transformations incorporating green innovations, focusing on management, implementation, and organizational outcomes. As the environment becomes a greater concern, incorporating green innovations to sustain competitive advantage becomes a business model imperative. The literature on sustainable business models and green innovations illuminates the role of managerial decisions, organizational capacity, and innovation in the transformative processes to sustain business model changes. Making the case for green innovations to address the dual concern of the environment and value creation, the research suggests that businesses can realize previously untapped green opportunities and improve their eco-social-economic performance. Reviewing research for the key barriers and drivers on the pathways of sustainable business transformations, the research demonstrates how businesses can adapt their business models in response to a pressing demand for sustainability. The research synthesizes literature to support the understanding of the role green innovations play for strategically renewing and sustaining the business and its fulfillment.

Keywords: Green Innovation; Sustainable Business Transformation; Sustainable Business Models; Managerial Practices; Environmental Sustainability; Competitive Advantage; ESG and Sustainability Strategy

1. Introduction

The need for environmental sustainability pushes companies to integrate green practices into their business operations and transformation strategies. Business model innovation is one of the important ways to achieve green sustainable development. The introduction of green innovation in the business model can create a win-win sustainable business model that captures green opportunities while enhancing environmental and social performance.

The adoption of the concept of a sustainable business model is helpful not only for reducing environmental impact but also for gaining competitive advantages and new business opportunities. The fast-growing concern about sustainability has drawn different realms of society, including government, non-governmental organizations, and enterprises, to explore opportunities and challenges about sustainability at a larger system. However, from a firm perspective, the exploration of a sustainable business model is still limited. Business managers who wish to carry out business transformation towards sustainability could refer to the barriers, drivers, path, and implications proposed by scholars. Describing the incorporation of green innovation in a business model corresponding to the sustainability pressures facing the entire society is necessary by extensively reviewing related academic literature. (Guo, Cao, Qu, & Tseng, 2022).

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2. Theoretical Foundations of Green Innovation

As the environmental sustainability crisis deepens, the global community advocates for reforms to save the Earth and promote sustainable lifestyles. Green innovation as management practice is vital for sustainable transformation. The phenomenon has received increasing attention due to its importance for sustainable development (Li, Rasool, Cavus, & Shahid, 2024). Multinational companies are also transforming to attain economic sustainability.

Green innovation encompasses green product and service innovation, green process innovation, and green marketing innovation, aiming to achieve pollution reduction, resource efficiency, and sustainable development through radical and incremental green transformations. In business research, managers are viewed as individuals who make decisions; proactive managers possess specific approaches and attributes. A manager-oriented approach connects bigger-picture perspectives (sustainability, environmentalism, etc.) with local activities (decision-making, action, etc.), highlighting the significance of managerial arrangements for achieving widespread change. Specific tactical processes facilitating large-scale managerial participation in continuous green transformation and pro-environmental behaviour within companies remain an underexplored research topic. (Sun, Gao, Tian, & Guan, 2023)

3. Managerial Practices for Green Transformation

Firms actively pursue green innovation to alleviate pressing environmental issues arising from various business processes. Achieving a truly environmentally friendly operational system is not just beneficial but paramount in the context of modern business, as it significantly contributes to enhanced sustainability and ecological well-being. Implementing thoughtful strategic, effective management, and refined operational practices to successfully execute green transformation is crucial for effective and meaningful execution of these initiatives. (Le, 2022)

Managerial practices associated with green innovation include strategic alignment to align operational activities with sustainability goals; leadership and organizational change to cultivate a green culture; resource allocation and investment to secure funding for green projects; process innovation to enhance operational efficiency; and collaboration to establish relationships with external parties (Pandian Ganapathy, Natarajan, Gunasekaran, & Subramanian, 2014).

3.1. Strategic Alignment and Vision

The importance of business strategy is highlighted as sustainability objectives must be integrated into companies' long-term vision statements ((Anbarasan, 2018). This integration safeguards these objectives and aligns all organization members towards the same target. Considering environmental impacts is a strategic necessity in today's competitive context, and modern customers give priority to environmentally friendly products (Zana, 2016). A linear relationship exists; if companies seek to improve sustainability and promote green technologies, they must include sustainable development in their strategic aims. Companies with limited circular economy strategies are not considered sustainable.

Strategic alignment is thus necessary for setting up such objectives. Circular innovation is defined as the development of new, circular systems, models, and services. Green innovation may have detrimental consequences on a short- to mid-term basis, as significant resources must be relocated from conventional innovations to develop alternative, sustainability-oriented visions. Strategic alignment should thus be directed towards a vision centered on sustainable development as a leveraging tool enabling further resource allocation toward green projects. Such alignment constitutes a prerequisite for firms seeking to build

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circularity in parallel with productivity enhancement. (Al-Sharifi, 2023).

3.2. Leadership and Organizational Change

Organizational change and leadership are essential components of any sustainable transformation initiative (Mohammed Ahmed Zaid & Zafar Yaqub, 2024). Sustainability literature emphasizes the fundamental role of organizational and managerial change as a prerequisite for the successful implementation of sustainability, according to which the sustainable ambition usually involves redefining the organization's relationships with the production processes, products and services, stakeholders, the business model, and opportunity landscape. Organizational change addresses changes on the levels of key structures, activities, systems, managerial practices, governance, coordination, culture, transformational and strategic orientations, materiality, and sense-making; leadership change relates to mindsets, styles, and values towards environmental and social sustainability (Brophy Haney, Pope, & Arden, 2020). Organizations with specific leadership patterns related to green and sustainability transformations tend to leverage green investments more effectively in sustainable business transformation. Given that people tend to operate within the familiar intellectual frameworks of their earlier experiences and the companies engage in exploratory innovation in new areas, completing the organizational change and establishing the new collective framework well in advance holistically facilitates and accelerates the progress.

3.3. Resource Allocation and Investment

Enabling green transformation requires appropriate resource allocation and investment—yet this often remains a challenge. Green process innovation (G_PROC) demands substantial investments to adjust technology and business models. In the short term, implementing G_PROC may cause profit reductions and competitive disadvantages while firms incur high spending on personnel, training, management, and research. Innovation entails elevated risks due to uncertainties around technology viability and technical constraints, with benefits often accruing only over long timeframes (Zhao Wang & Ahmad, 2024). In the face of increasingly stringent regulations, companies with low levels of G_PROC also struggle to cover the costs associated with environmental protection.

3.4. Process Innovation and Operational Efficiency

Firms invest in process innovation to gain operational efficiency through enhanced productivity or reduced resource and waste inputs. Green process innovation addresses both opportunity and obligation. As environmental regulations and stakeholder demands grow, firms must adopt eco-friendly production methods (Zhao Wang & Ahmad, 2024). Europe accounted for the most stringent environmental regulations in 2019, making substantial effort in process innovation to reduce hazardous substances in industrial output approved under the REACH framework.

Improvements in green process innovation increase the reduction levels on resource or waste outputs. Business strategies that focus on high-value applications or products may define greater eco-oriented arrangements, leading to more substantial savings on energy, material, and emissions reduction. Consequently, green process innovation takes place prior to substitution (Arogyaswamy, 2019).

3.5. Collaboration, Stakeholder Engagement, and Partnerships

The latest advances in green innovation research emphasize activity in a critically important area of green innovation—the collaboration between firms and their stakeholders regarding sustainability-oriented solutions. (Sarango-Lalangui, Castillo-Vergara, Carrasco-Carvajal, & Durendez, 2023) suggest that although achieving sustainable practices or products

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is inherently a firm-driven process, drawing on the resources, capabilities, and knowledge of partners and suppliers via collaborative frameworks is essential for success. Such collaboration supports the larger endeavor of environmental sustainability and has been linked to open innovation, corporate social responsibility, and stakeholder theory.

Achievement of green innovation is considered a prerequisite for success in the transformation towards more environmentally sustainable business. This makes simultaneous partnership with other firms essential for successful green innovation. The goal of collaboration is the joint enhancement of sustainability, which is increasingly positive for firms. Senior managers at relevant organizations report that green-oriented collaborations with customers, suppliers, and partners have increased markedly in recent years, resulting in enhancements in environmental, economic, and social sustainability. The configuration of the designated partner and collaborative channels involves strategic decisions in the innovation process. (Le, 2022).

4. Challenges in Implementing Green Innovation

Aiming to serve society and produce value for stakeholders, businesses are compelled to confront complex obstacles. Corporate strategies must align with visions of sustainable and responsible development, deploying approaches and capabilities capable of generating new or superior value. Continuous shifts in technology and industrial structures necessitate innovation across diverse facets of the enterprise. (Chopra, et al., 2024); (Voyko & Voyko, 2022).

Innovation aimed at resolving pressing social issues while enabling economic development has been dubbed “green”. Drivers for green innovations are expected to grow, considering demand for energy conservation, reduction of greenhouse gases, diminishing water resources, and escalating competition among cities and nations seeking sustainable growth models. Green innovation undergirds the establishment of green enterprises, green supply chains, and green economies (Ullah, Ahmad, Ullah Khan, Badulescu, & Badulescu, 2021). However, obstacles hinder widespread uptake in the Asia-Pacific region current corporate competitive strategies place priority on economic and financial performance over enhancing corporate social responsibility and meeting stakeholder expectations.

The absence of a universal or consistent definition or framework for green innovation hinders its embedding in business philosophies and strategies (SO Nadarajah & Aiedah Binti Sabri, 2016). Ideally, green innovations should also encompass social responsibility, equity, and wellness elements. In addition, green innovations often evoke misconceptions. For example, the notion of “green” still predominates in areas such as “green product,” “green energy,” and “green supply chain,” with the “innovation” facet relegated to a subordinate role. The.

4.1. Financial and Economic Constraints

Green innovation is closely associated with investments and expenditure on green innovation practices by the organisations. Even after consultation, the organisation has to invest heavily in research and development of the green innovation framework. Implementation of green innovation not only requires investments in time and money, but also additional extra investments to develop technologies to meet the changing expectations of the environmental issues. In addition, maintaining a competitive advantage impedes the organisations to invest heavily on green innovation. Sustainability is a costly proposition; hence growing businesses need to weigh its investments against potential future returns (D. German, Agung Ngurah Perwira Redi, Kester S. Ong, & L. Liwanag, 2023). Studies reveal that around 62% of the organisation towards a transition in Circular Economy face varied

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economic constraints hamper the green innovation process, especially the large scale small scale firms and medium scale firms. Various concerns such as; how to evaluate the returns from green investment strategy for the business and the need for governmental support for small scale organisation are few issues raised by the managers (Zhao Wang & Ahmad, 2024).

4.2. Organizational Inertia and Cultural Barriers

According to research, organizational inertia is a leading barrier to companies that are pursuing green innovation (Ullah, Ahmad, Ullah Khan, Badulescu, & Badulescu, 2021).. Established routines and capabilities often become rigid over time, limiting the firm to only marginal improvements. Organizations frequently lack motivation to invest in green innovation because intermittent investment, a lack of guidance, or a lack of experience can make the returns uncertain. When existing capabilities also provide such a competitive edge, inertia towards more radical retooling grows, as leadership must also be convinced to invest anew. As a result, firm and project turnover can become sluggish and innovation patterns stiffer. Cultural resistance further strengthens inertia and creates inertia before initial investment is made. Developing green innovations requires the most radical change to existing practices, that is further impeded when other large initiatives are underway. Some firms that engage in radical change usually find themselves struggling to do so with green potential.

4.3. Regulatory and Policy Uncertainty

According to the Chinese State Council, economic policy uncertainty on both international and domestic fronts has been considered as a serious constraint that aggravates institutional risks and rises the compliance costs of enterprises that limits the impetus towards Green Innovative Transformation (Tang, Qi, Zhou, & Hua, 2023). The emergence of sudden environmental policies would have an overshadowing influence on firms' existing projects, and would lead to lagged effects on the green innovation output which hinders companies to achieve innovation goals that bring long-term and greater revenue. Within the context of developing countries, preliminary research indicates that companies in a highly uncertain policy environment are resistant to high unit increase of command-control policies after the introduction of innovative transformation activity, while are prone to boost the rewards of policies remain low. While policy economic uncertainty is high, mandatory requirements are ineffective triggers for innovatively boosting the green transformation projects. The attributes of economic policy uncertainty remain the less explored field on the managers' strategic decision-makings under insufficient incentives regimes, demonstrating a necessity for further scholarly investigation (Zhu, Sun, Zhang, & Wang, 2021).

Diverse instruments of environmental regulation (command-control, economic, and **voluntary) have considerable heterogeneity in relation to companies' green transformation** efforts undertaker by the potentiality of stimulation to company-driven innovation compensation market, and such kind of heterogeneity analysed in the context of different stages (high momentum or low momentum) where enterprises green transition in the the counteraction of economic policy uncertainty do not share the same counterpart with those are served without economic policy uncertainty. As such, fresh insights could emerge and contribute to the literature on the roles of economic policy uncertainty within company discretion activities for those emerging economies and countries sustain a mixture of marketization with government intervention approach. (Du, Li, & Wang, 2022); (Tang, Qi, Zhou, & Hua, 2023).

4.4. Measurement, Disclosure, and Reporting

Recognizing the challenges posed by climate change at a global scale, many

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organizations are integrating a green perspective into their practices. Unfortunately, research indicates that businesses often struggle to define their sustainability strategies and report credible green initiatives that reflect their actual level of commitment (G. Nuñez, 2017). Quantifying green practices involves analyzing data, which remains a challenge. As Professor Michiel R. A. de Lange put it, "more than 80% of managers view sustainability as essential on a strategic level, while fewer than 30% translate that into concrete measurable objectives at the operational level".

4.5. Supply Chain and Supplier Integration

Supply chain and supplier integration play a crucial role in supporting green innovation and facilitating effective sustainability transformation. Prioritizing environmental concerns in the supply chain not only strengthens companies' social responsibility practices but also enhances competitiveness (Rajabian Tabesh, Batt, & Butler). The adoption of green practices by suppliers and customers significantly boosts circular economy initiatives and eco-innovation (Jermsittiparsert, Sriyakul, & Sangperm, 2019). Furthermore, implementing a global supplier development program is a pivotal step toward achieving net-zero aspirations (Liu et al., 2022). Academic investigations underscore the significance of supply chain integration, yet businesses frequently grapple with managing relationships with external partners (Trotta et al., 2020).

5. Outcomes and Impacts of Green Innovation

Green innovation contributes to sustainable transformation through the implementation of new environmentally friendly technologies and the development of new strategies, concepts, and business models to address business operations and stakeholder interactions. Effective managerial practices facilitate the green transformation process, leading to noteworthy outcomes. According to a meta-analysis, diverse and integrated environmental practices influence several strategies for evolving business operations, orientation towards stakeholders, and overall green innovation, all positively affecting economic performance (Li, Zhang, Weng, & Yan, 2024).Engaging in practices associated with sustainable development generates diverse advantages, such as waste reduction, cost savings, increased customer satisfaction, improved product quality, and enhanced public relations. Organizations adopting environmentally sustainable strategies can achieve sustained competitive advantage through the integration of pollution prevention, product stewardship, and sustainable development practices. The emergence of socially responsible purchasing behaviors has prompted the adoption of new environmentally sustainable business models. Open innovation plays a significant role by enabling organizations to leverage external collaboration and internal knowledge networks for the development of environmentally friendly products. Alignment between environmental practices and innovation strategies further enhances business performance (Sarango-Lalangui, Castillo-Vergara, Carrasco-Carvajal, & Durendez, 2023).

5.1. Environmental Performance and Resource Productivity

Firms that have deployed green innovation report substantial reductions in resource consumption per unit of output (Li, Zhang, Weng, & Yan, 2024). These improvements not only minimize holdings of carbon and other pollutants—tangible benefits in emergency situations—but also positively impact overall operating and waste-disposal costs. Increased resource productivity allows for further investment in eco-friendly technology, thereby creating a virtuous cycle of eco-innovation. Further, rising forestland and biomass coverage has led to an increase in biodiversity and the restoration of adaptive capacity at the landscape scale. Improved vegetation cover and cleaner emissions contribute to the recovery of wetland ecological function and a decline in landscape fragmentation, as well as benefits to carbon and

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nitrogen cycles. Air and water quality have improved across basins, contributing to a significant reduction in flood risk, with streamflow maintenance and drought hazard mitigation also receiving favorable impact ratings for these benefits.

5.2. Economic Performance and Competitive Advantage

The implementation of Green Innovation (GI) practices tends to enhance economic or financial performance and competitive advantage (D. German, Agung Ngurah Perwira Redi, Kester S. Ong, & L. Liwanag, 2023). They enable the development of new and sustainable products and services, improved pricing power, increased market share and sales, and lower operational and production costs. Hence, GI has the potential to substantially improve both the financial bottom line and competitive edge.

Firms pursuing GI obtain a higher return on investment with the sale of new and upgraded technologies. Green GI not only reduces costs but also allows companies to charge a premium for their green products and creates competitive advantages. Green technology practices enhance companies' reputations, which in turn improves competitive position. Companies that promote eco-innovation through a formal eco-innovation strategy or broader GI practices benefit from a more substantial performance enhancement.

5.3. Social and Stakeholder Value

Social and stakeholder value refers to a company's contribution to improving the well-being of society, and arises from engagement in practices targeting disadvantaged populations, enhancing consumer safety, or helping local communities (Arogyaswamy, 2019). Employee involvement and boundaries spanning between the firm and society can bolster social and stakeholder value. Initiatives pursued at the firm bottom-of-the-pyramid, such as affordable soap manufacturing for low-income families or the development of drugs for vulnerable populations, address unmet societal needs and correspondingly create wider social benefits.

Employee participation in firm-sponsored initiatives, including the provision of healthier snacks, support for microcredit programs, assistance in building homes, and efforts to aid the homeless, further enhances social value and fosters employee commitment. Local entrepreneur engagement enables the building of community networks—for example, the repair of wind farms or electric vehicles—that nurture community ecosystems. Companies such as Starbucks and Whole Foods enhance social welfare through fair trade practices and local sourcing, while initiatives addressing employment and skills shortages have arisen in the technology sector. The Aravind Eye Hospital in India exemplifies process innovation that simultaneously meets basic social needs and fosters corporate sustainability: the institution delivers low-cost, subsidized eye surgeries to the poor, offsetting costs through charges paid by higher-income patients. (Portocarrero & Burbano, 2024).

5.4. Risk Management and Resilience

Operational strategies focused on sustainability contribute to the mitigation of environmental risks associated with industrial activity, thereby enhancing corporate resilience (Kitsikopoulos, 2018). Robust environmental risk management directly influences an organization's performance during periods of economic turbulence (Bueno Campos, 2017). Green innovation operates at the nexus of enhanced environmental performance and mitigated risk environment. Well-structured green transformation strategies therefore become instrumental in risk management and adaptation; enhanced organizational resilience enables a focus beyond preaching sustainability toward tangible and essential sustainable business transformation.

Green organizational transformation to meet environmental challenges also

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demonstrates a performance enhancement which itself contributes to resilience under broadening criteria. The comprehensive green innovation approach considered combines the core green transformation practices of strategic alignment, leadership, resource allocation, process innovation, external stakeholder integration, and measurement. The approach simultaneously extends the external and internal performance scope, integrating diverse stakeholder engagement and comprehensive internal operating improvements. Transformational outcomes therefore arrive within the extended performance framework, contributing directly to both green business transition and risk adaptation resilience. (Borah, Dogbe, Dzandu, & Pomegbe, 2023)

6. Implications for Practice

In the context of the post-COVID-19 economic recovery, companies are now prioritizing green investment as a key driver for maintaining competitive capabilities and achieving economic recovery. Beginning with environmental protection and transitioning to sustainability, European, American, and Japanese enterprises have established clear guidelines for green management. Although the need for sustainable corporate transformation has been widely recognized, the content of corporate green management has not been clearly defined. (Luo, Wang, Luo, Tong, & Xu, 2024).

Among the various concepts associated with green management, green innovation, defined as the transformation of the corporate production process and the development of green products with the goal of improving environmental protection, has garnered increasing attention as an essential component of corporate green management. While related literature has examined green innovation at the theoretical level, few studies have explored the actual practices adopted by enterprises to enhance their green innovation capabilities, particularly from the luxury industry perspective. Applying the qualitative case study method, semi-structured interviews were conducted with corporate executives and external analysts to investigate the green innovation practices of major luxury groups, including LVMH, Kering, and Richemont, as well as government-led green policy changes and their impact on the luxury industry. Following the principles of grounded theory, the research focuses on the specific managerial practices that can significantly improve a company's capacity for green innovation and identifies key factors and external research expectations expected to increase the likelihood of adopting more extensive green management initiatives (Li, Yaseen Bhutto, Waris, & Hu, 2023).

7. Conclusion

Green innovation plays a pivotal and crucial role in driving sustainable business transformation, as it brings about not only significant but also far-reaching changes in practices, processes, and the overall organizational culture of various enterprises across different sectors. However, a wide range of diverse challenges continues to hinder its effective implementation across numerous sectors and industries, rendering the journey towards sustainable practices more complex than one might imagine. Empirical insights gathered from extensive and rigorous research highlight the vital importance of existing literature in scrutinizing and understanding the detailed requirements that are necessary for achieving a successful green transformation through innovative approaches and methodologies. This comprehensive examination draws on a diverse array of data sources gathered from various countries renowned for their sustainability efforts, including Norway, New Zealand, Sweden, and the United Kingdom. This extensive range of data allows for a thorough analysis that focuses on environmental practices, identifies common challenges faced by enterprises, and explores the myriad potential outcomes of such transformative processes. A deeper

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understanding of the multifaceted and dynamic role that green innovations play equips managers and decision-makers with the essential tools necessary to implement the most suitable and effective practices efficiently within their organizations. By anticipating potential obstacles and strategically leveraging the expected advantages and benefits of green innovation, organizations can cultivate a robust and sustainable framework that supports and actively promotes lasting transformation across their entire operations, leading not only to overall improvements in environmental performance but also enhancing social responsibility and corporate stewardship in the marketplace. (Bakar & Senin, 2016)

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