

Innovation and Sustainable Development in Family Businesses: The Role of Competitive Intelligence

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Abstract

This study investigates the influence of innovation on the sustainability of family-owned businesses in Nigeria, focusing on the moderating role of competitive intelligence (CI). Utilizing theories such as the resource-based view and dynamic capabilities, the research examines how these businesses can leverage innovation for long-term sustainability. A cross-sectional survey involving 237 employees from 25 family businesses was conducted, employing multiple regression analysis to test the hypotheses. The findings reveal a positive relationship between innovation and sustainability, indicating that family-owned businesses can enhance their sustainability by adopting innovative practices. Additionally, competitive intelligence is shown to strengthen this relationship, allowing firms to adapt more effectively to market dynamics. The study emphasizes the importance of integrating business agility and strategic planning as essential components for achieving sustainable outcomes. Addressing a significant gap in existing literature, this research provides valuable insights into how family enterprises can utilize CI to maximize the benefits of innovation for sustainable growth. It highlights the critical need for these businesses to innovate responsibly and strategically to enhance their competitive advantage. The study concludes with prioritized recommendations for family enterprises and policymakers to foster sustainable practices aligned with global sustainability goals.

Keywords: Business Agility, Competitive Intelligence, Family-owned businesses, Innovation, Sustainability.

Introduction

Sustainable development is a priority for modern businesses seeking long-term growth and prosperity. Achieving this requires organizations to integrate socio-economic, ecological, and technological goals into their strategies, as highlighted by Sustainable Development Goal 12 (SDG 12), which advocates for responsible consumption and production (United Nations, 2015). Family-owned businesses play a crucial role in many economies. To ensure their long-term survival, these businesses must adopt sustainable practices. Innovation and competitive intelligence (CI) are key drivers of sustainability. While innovation fuels growth and adaptation, CI enables businesses to anticipate market trends, competitor strategies, and environmental factors to make informed strategic decisions. Paired with business agility and strategic planning, CI strengthens innovation management, driving sustainable outcomes. Therefore, it has been established that innovation and CI are key factors in the sustainable development of organizations (Heras-Rosas & Juan, 2021).

Despite its importance, limited research exists on how innovation and CI impact sustainability in family-owned businesses, particularly in Nigeria, where family firms dominate the small business landscape. Furthermore, little is known about how business agility and strategic planning influence the relationship between innovation and sustainability, creating a significant research gap (Trizotto et al., 2024). This study aims to fill this gap by examining how innovation, CI, strategic planning, and organizational agility influence the sustainability of Nigerian family-owned businesses.

The study aims to assess the impact of innovation on the sustainable development of family-owned businesses (FOBs), exploring how business agility and strategic planning contribute to enhancing sustainability. Additionally, it examines the moderating role of Competitive Intelligence (CI) in the relationship between innovation and sustainability, providing insights into how family businesses can leverage CI to maximize the benefits of innovation for long-term sustainable growth.

To achieve these objectives, the following hypotheses are tested:

- H₁: Innovation has a positive impact on sustainability in family-owned businesses.
- H₂: Competitive intelligence moderates the relationship between innovation and sustainability in family-owned businesses.
- H₃: Business agility and strategic planning positively influence the relationship between innovation and sustainability in family-owned businesses.

Theoretically, this study contributes to the expanding body of literature on family business management by investigating the potential of innovation to facilitate sustainability initiatives, particularly concerning SDG 12. Practically, it provides insights for family businesses to reduce environmental impact, enhance resource efficiency, and align with global sustainability goals. Emphasizing CI as a tool for informed decision-making, the study highlights how family enterprises can gain a competitive advantage by innovating responsibly and adapting

strategically. These findings offer valuable guidance for family business leaders, policymakers, and researchers in fostering sustainable practices and competitive resilience.

LITERATURE REVIEW

Conceptual Framework

Family firms are business organizations where two or more family members serve as directors or have two or more directors related to family ties. Family-owned businesses are a special type of firm reflecting the identity and values of founders and/or the founder's family having considerable influence on the orientation of these organizations. The unique nature of family businesses enhances flexibility, intense customer orientation, and community involvement. Family-owned businesses struggle to balance traditional values and the need for innovation while ensuring that their operations align with the Sustainable Development Goals (Trizotto et al., 2024).

Innovation and Sustainability

Innovation is defined by Van De Ven (1986) as “the development and implementation of new ideas by people who engage in transactions within an institutional order.” It involves creating new ideas, products, and methods that drive sustainability. Family businesses can leverage innovative approaches to minimize environmental impact, enhance resource efficiency, and develop sustainable products. Nevertheless, innovation alone is insufficient for achieving sustainability; businesses also need competitive intelligence (CI), which involves systematically collecting and analyzing market and competitor data to inform strategic decisions (Fleisher & Bensoussan, 2015).

Competitive Intelligence

The concept of intelligence refers to systematically processed information that becomes actionable knowledge, enabling informed decision-making. As a knowledge-based asset, intelligence integrates, interprets, and evaluates environmental information, helping organizations exploit opportunities and counter threats (Heras-Rosas & Juan, 2021). It includes various types, such as market intelligence, competitor intelligence, and technological intelligence, all essential for organizational success. Competitive Intelligence (CI) specifically focuses on gathering and analyzing information about competitors to improve tactical and strategic decision-making. It enables businesses to identify challenges, anticipate market trends, and understand competitive forces, ultimately enhancing organizational efficiency (Carlos & Herrera, 2021). Effective CI processes include four phases: planning information collection, gathering data from diverse sources, using analytical tools for analysis, and communicating insights to management for strategic decisions.

The Competitive Intelligence process can be summarized in four main phases: planning the collection of information according to key intelligence needs; gathering information from various sources; using analytical tools to analyze data; and collating information and communicating it to management for decision-making. Although historically informal, CI has evolved into a systematic approach necessary for identifying opportunities and threats in

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competitive environments. For family-owned businesses, adopting CI practices can bridge the gap between innovation and sustainability, enabling these firms to thrive in dynamic markets and align with global sustainability objectives.

Theoretical Framework

This study is grounded in three key theories: Innovation Theory, Resource-Based View (RBV), and Dynamic Capabilities Theory. Together, these frameworks help elucidate the interplay between innovation, sustainability, competitive intelligence, and organizational agility.

Innovation Theory

Innovation is crucial for sustainable growth, as highlighted by Joseph Schumpeter's foundational work in the early 20th century. Schumpeter (1934) defined innovation as the introduction of new products or processes, emphasizing that businesses must continuously innovate to remain competitive. His concept of "creative destruction" illustrates how innovations replace outdated firms and products. In family-owned enterprises, innovation can enhance sustainability by improving products and processes, aligning with Sustainable Development Goal (SDG) 12 on responsible consumption (Tidd & Bessant, 2020). Thus, innovation is anticipated to facilitate cleaner production methods and resource optimization.

Resource-Based View (RBV)

The RBV posits that a firm's unique resources—both tangible and intangible—are critical for achieving sustainable competitive advantage. Initially articulated by Barney (1991), this theory emphasizes the strategic analysis of internal resources to create value and improve performance. By effectively managing these resources, organizations can develop core competencies that provide a competitive edge (Inkinen, 2016). In this context, innovation and competitive intelligence are viewed as vital assets that bolster the sustainability of family-owned businesses. When companies leverage their unique strengths and insights from competitive intelligence, they enhance their chances of maintaining a sustainable advantage.

Dynamic Capabilities Theory

Teece and Pisano (1994) expanded on the RBV with the Dynamic Capabilities Theory, which focuses on a firm's ability to adapt and reconfigure its resources in response to rapidly changing environments. This theory underscores the importance of agility in strategic planning and execution for achieving long-term sustainability (Rua et al., 2018). Dynamic capabilities are essential for family-owned firms to navigate market changes and maintain their competitive edge.

While Innovation Theory, Resource-Based View (RBV), and Dynamic Capabilities Theory provide a robust framework for understanding the relationships between innovation, sustainability, and competitive intelligence, they have notable limitations. Much of the existing literature emphasizes theoretical constructs without adequate empirical validation across diverse contexts, and there is often a scarcity of practical case studies demonstrating how these theories apply in real-world family businesses. Therefore, while these theories offer valuable

insights into how family-owned enterprises can leverage innovation and competitive intelligence for sustainable success, further empirical research is essential to validate these frameworks in practice and assess their applicability in various business environments.

Empirical Review

Sustainability and Innovation

Empirical research consistently demonstrates a positive correlation between innovation and sustainability. Studies indicate that companies embracing innovation are more likely to adopt sustainable practices, as innovation often leads to the development of environmentally friendly products and processes. For instance, Cainelli, De Marchi, and Grandinetti (2015) found that firms implementing eco-innovation strategies achieved higher levels of sustainability, particularly in resource efficiency and environmental performance. In family-owned enterprises, innovation plays a crucial role in promoting sustainability, especially when long-term objectives take precedence over immediate profits (Chrisman, Chua, & Sharma, 2005; Onwuzulike et al., 2024). Family businesses often prioritize intergenerational continuity, making sustainability a core aspect of their operational strategy (Sharma & Sharma 2024). This leads to the hypothesis (H1) that a positive relationship exists between innovation and sustainability.

Moderating Role of Competitive Intelligence

Competitive intelligence (CI) is essential for businesses to identify market opportunities and respond effectively to external threats (Fleisher & Bensoussan, 2015). Research shows that CI enhances a company's ability to align its innovation strategy with market demands, thereby improving sustainable innovation capacity (Wright, 2011). For example, Mosey et al. (2007) found that firms utilizing CI in their innovation processes were more likely to achieve sustainable development outcomes. Furthermore, empirical evidence suggests that CI amplifies the impact of innovation by providing critical information for strategic adjustments (Tidd & Bessant, 2020). This supports the hypothesis (H2) that CI moderates the relationship between innovation and sustainability, particularly in helping firms navigate complex environments while aligning innovations with sustainability goals.

Business Agility, Strategic Planning, and Sustainability

Business agility refers to an organization's capacity to swiftly respond to market changes (Overby et al., 2006). This agility is vital for fostering both innovation and sustainability since it enables firms to adapt their strategies in real time. In family-owned enterprises, agility often manifests as decision-making flexibility and the ability to pivot in response to emerging trends (Sirmon & Hitt, 2003). Additionally, strategic planning plays a significant role in promoting sustainability by helping organizations anticipate future challenges and opportunities (Mintzberg, 1994). Research by Dibrell, Craig, and Neubaum (2014) indicates that firms with strong strategic planning capabilities are better positioned to integrate sustainability and innovation into their business models. Thus, hypothesis H3 posits that strategic planning and business agility positively influence the relationship between innovation and sustainability by enabling firms to adapt and incorporate sustainability into their long-term objectives.

Despite the established connection between innovation and sustainability, notable gaps persist in the literature. First, the moderating role of competitive intelligence in this relationship remains underexplored, particularly within family-owned enterprises. This study aims to address this gap by investigating how CI enhances the effect of innovation on sustainability in these uniquely oriented businesses. Second, there is limited understanding of how organizational behavior factors like strategic planning and business agility influence the innovation-sustainability nexus. While some evidence suggests that these elements support sustainability efforts, empirical studies examining their interactions within family-owned contexts are scarce. By integrating these dimensions into the conceptual model, this research seeks to provide a more comprehensive understanding of how family businesses can leverage innovation, CI, agility, and strategic planning to achieve sustainable outcomes.

METHODOLOGY

Research Design

This study uses a quantitative research approach to examine the relationship between innovation and sustainability in family-owned businesses, considering the moderating role of competitive intelligence as well as the influence of business agility and strategic planning. The study uses a cross-sectional survey method, with data collected from family-owned firms in agriculture, manufacturing, services, retail, and automobiles. This method enables the analysis of correlations between variables at a single point in time, providing insights into how firms integrate innovation and competitive intelligence to achieve sustainability (Creswell, 2014).

Specifically, the study focused on family-owned businesses registered with the Manufacturers Association of Nigeria (MAN) with headquarters or branches in Lagos Chambers of Commerce and Industry and residing in Lagos State. The selection of Lagos was based on the cosmopolitan nature of the State. Lagos state has a diverse population, including foreigners and Nigerians from different tribes. Religious diversity is also rich; the State has many Muslims, Christians, and other faiths. Its small landmark encourages both industrial and agricultural activities. The State is the commercial nerve Centre of the country. With its vintage position, it has the largest concentration of different industries.

The responding family businesses are selected based on the operational definition of Villalonga & Amit (2006). The family businesses fulfill the following conditions: family members hold managerial positions, one or more family members are responsible for managing the business, at least two members of the founding family are actively involved as key executives, the CEO is either the founder or a co-founder, and the company is controlled by the founding family.

Population and Sample

The twenty-five purposively chosen family-owned enterprises comprise the practical population of this investigation. The sample consists of 237 employees who were selected from these reputable family-owned businesses. These businesses are in a variety of sectors, including agriculture (3%), manufacturing (33.3%), services (18.1%), retail (8.4%), and automotive (37.1%). The respondents (n=237) were either the CEOs, family members who hold managerial

positions in the firm, or non-family members who hold strategically important positions in the business. In terms of the years of operation and generation of ownership, the enterprises that were sampled are a diverse group. For example, the study is appropriate for evaluating the impact of family dynamics on innovation and sustainability, as it includes family-owned businesses that are first-generation (53.6%), second-generation (28.3%), and third-generation or higher (18.1%).

The study collected data from family-owned enterprises in various industries using a convenience sample technique. Although convenience sampling is not probability-based, it enables data collection from respondents who are conveniently available and willing to engage in the study (Saunders, Lewis, & Thornhill, 2016). Given the distinctive characteristics of family companies, this strategy was deemed ideal for gathering information from a difficult-to-reach group.

Data for this study were gathered through a standardized questionnaire distributed to family-owned firms. The questionnaire was developed to collect data on firm size, sector, years in operation, ownership generation, and the major study variables of innovation, sustainability, competitive intelligence, business agility, and strategic planning. For most items, respondents were asked to score their agreement with various assertions using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree).

The poll took an average of 15 minutes to complete, with results gathered over four weeks.

Measures

This investigation concentrates on numerous critical variables, each of which is assessed using Likert-type scales. The independent and moderating variables are innovation, competitive intelligence, business agility, and strategic planning & risk management, while the dependent variable is sustainability.

Innovation: Assessed using four Likert-scale items that evaluate the degree to which businesses have created new products, processes, or market opportunities in response to competitive intelligence. The innovation scale was reliable, with a Cronbach's Alpha of 0.775, and it ranged from 7 to 16 (Tidd & Bessant, 2020).

Sustainability is assessed through the use of four metrics that concentrate on the impact of competitive intelligence, business continuity, and long-term financial performance. The sustainability scale had a Cronbach's Alpha of 0.867, which suggests that it had strong internal consistency, and it ranged from 4 to 16 (United Nations, 2015).

Competitive Intelligence (CI) is evaluated through the utilization of four metrics that evaluate the extent to which organizations accumulate and implement market intelligence for strategic decision-making. The Cronbach's Alpha of 0.813 indicates that the scale was reliable, with a range of 1 to 4 (Fleisher & Bensoussan, 2015).

Business Agility is evaluated by utilizing three items that evaluate the capacity of businesses to promptly adapt to market changes and customer preferences. The Cronbach's Alpha of the scale was 0.721, and it was calibrated from 2 to 4 (Senge, 2006).

Strategic Planning and Risk Management is assessed through the use of four items that evaluate the extent to which businesses integrate CI into their strategic planning processes and mitigate risks associated with market fluctuations. The Cronbach's Alpha of 0.784, which indicates acceptable reliability, was obtained for the scale, which ranged from 5 to 16 (Mintzberg, 1994).

The study's hypotheses were tested using a variety of statistical techniques in SPSS version 26, which was used to conduct data analysis. Descriptive statistics summarized sample characteristics, including the distribution of enterprises across sectors, generations, and years of operation (Saunders et al., 2016). The internal consistency of the scales for innovation, sustainability, competitive intelligence, business agility, and strategic planning was evaluated through reliability testing using Cronbach's Alpha. All scales demonstrated satisfactory reliability levels (alpha values exceeding 0.70) (Nunnally, 1978). To evaluate H1 (innovation's beneficial influence on sustainability), a straightforward linear regression was implemented, with sustainability serving as the dependent variable and innovation as the independent variable (Tabachnick & Fidell, 2013). A moderated regression analysis was conducted to evaluate H2, which asserts that the relationship between innovation and sustainability is moderated by competitive intelligence. An interaction term (innovation \times competitive intelligence) was incorporated into the model (Aiken & West, 1991). The positive influence of business agility and strategic planning on the relationship between innovation and sustainability was tested using multiple regression analysis, with sustainability as the dependent variable and innovation, business agility, and strategic planning as the independent variables. Furthermore, the exploratory factor analysis (EFA) confirmed the structure of the scales for innovation, CI, agility, and sustainability, demonstrating that all items loaded well on their respective factors (loadings above 0.5) and accounted for over 60% of the variance for each construct (Field, 2013).

Participants in the study volunteered, and they were notified of their opportunity to withdraw without penalty. All data obtained were anonymized to preserve respondents' privacy.

Although this study sheds light on the relationship between innovation and sustainability in family-owned enterprises, some limitations must be addressed. The use of convenience sampling may reduce the findings' generalisability to all family-owned firms. Furthermore, because the study is cross-sectional, causal linkages cannot be determined clearly (Creswell, 2014). Future studies should use longitudinal designs to investigate changes in innovation and sustainability across time.

RESULTS AND DISCUSSION

Descriptive Statistics

The data analysis tested three hypotheses to understand the relationships among innovation, sustainability, competitive intelligence (CI), business agility, and strategic planning.

A total of 237 respondents from family-owned businesses participated, representing various sectors: agriculture (3%), manufacturing (33.3%), services (18.1%), retail (8.4%), and automobiles (37.1%). Most businesses (76.4%) had been operating for over 20 years, with

ownership spanning first-generation (53.6%), second-generation (28.3%), and third-generation or higher (18.1%). The mean scores of key variables are presented in Table 1.

Table 1: Descriptive Statistics for Key Variables

Variable	Mean	SD	Min	Max	Cronbach's α
Innovation	13.58	2.21	7	16	0.775
Sustainability	13.32	2.36	4	16	0.867
Competitive Intelligence	3.43	0.65	2	4	0.813
Business Agility	3.43	0.76	2	4	0.721
Strategic Planning	13.42	2.45	5	16	0.784

Source: Survey 2024

Table 1 presents descriptive statistics for key variables related to the study of innovation, sustainability, competitive intelligence, business agility, and strategic planning in family-owned businesses. The table includes mean scores, standard deviations (SD), minimum (Min) and maximum (Max) values, and Cronbach's alpha for each variable.

Table 1 highlights that family-owned businesses demonstrate a strong emphasis on innovation and sustainability, reflected in high mean scores (13.58) and reliable measurement scales ($r=0.775$). Innovation and sustainability exhibit moderate variability, indicating differences in their application across firms. Competitive intelligence and business agility show consistent perceptions among respondents, with minimal variability and acceptable reliability. Strategic planning displays the highest variability, reflecting diverse approaches among businesses. Overall, Cronbach's alpha values confirm the reliability of all scales (0.72 - 0.86), validating the data as a robust foundation for analyzing how these variables interact to influence sustainability outcomes in family-owned enterprises.

Hypothesis Testing

H1: Innovation positively impacts sustainability.

Regression analysis (Table 2) indicates a statistically significant positive relationship between innovation and sustainability ($R^2 = 0.13$, $F(1, 235) = 35.166$, $p < .001$). Innovation explains 13% of the variance in sustainability outcomes.

Table 2: Model Summary and Coefficients for Innovation and Sustainability

Model	R ²	Adjusted R ²	F	Sig.	B	SE	β	t	Sig.
Constant					7.225	1.040		6.947	.000
Innovation	.130	.126	35.166	.000	0.449	0.076	0.361	5.930	.000

Source: Survey 2024

Table 2 summarizes the model analyzing the relationship between innovation and sustainability in family-owned businesses, presenting key statistical measures and coefficients. The R² value of 0.130 indicates that approximately 13% of the variance in sustainability can be explained by innovation, suggesting that while innovation positively impacts sustainability, other influencing factors likely exist beyond the scope of this model. The Adjusted R² value of 0.126 is slightly lower, reflecting the number of predictors in the model and indicating a modest fit. The F-statistic of 35.166, with a significance level of 0.000, confirms that the overall model is statistically significant, demonstrating that it provides a better fit to the data than a model without predictors. The constant term is 7.225 with a standard error of 1.040, which is significant (t = 6.947, Sig. = .000), representing the expected value of sustainability when innovation is absent. For innovation, the coefficient (B) is 0.449 with a standard error of 0.076, indicating a positive relationship; specifically, for each one-unit increase in innovation, sustainability increases by approximately 0.449 units, holding other factors constant. The standardized coefficient (β) of 0.361 and t-value of 5.930, both statistically significant (Sig. = .000), reinforce that innovation is a strong predictor of sustainability in family-owned businesses. Overall, Table 2 illustrates the significant role that innovation plays in enhancing sustainability outcomes within these enterprises. These findings provide evidence for strategies that prioritize innovation to enhance sustainability outcomes.

H2: CI moderates the relationship between innovation and sustainability.

Moderation analysis (Table 3) reveals CI strengthens the innovation-sustainability relationship (R² = 0.206, F(3, 233) = 20.185, p < .001). However, the interaction term (Innovation × CI) shows a negative coefficient, suggesting complexities arise at high levels of CI.

Table 3: Moderation Analysis of CI on Innovation-Sustainability Relationship

Predictor	B	SE	t	Sig.
Constant	2.317	0.421	5.504	.000
Innovation	0.211	0.096	2.193	.029
Competitive Intelligence (CI)	0.426	0.406	1.048	.295
Innovation × CI	-0.360	0.082	-4.390	.000

Source: Survey 2024

Table 3 presents the results of a moderation analysis that investigates the influence of

competitive intelligence (CI) on the relationship between innovation and sustainability. The constant term is 2.317, with a standard error (SE) of 0.421, and it is statistically significant ($t = 5.504$, $\text{Sig.} = .000$), indicating the expected value of sustainability when both innovation and CI are absent. The coefficient for innovation is 0.211 ($\text{SE} = 0.096$), suggesting a positive relationship with sustainability that is statistically significant ($t = 2.193$, $\text{Sig.} = .029$). However, the coefficient for CI is 0.426 ($\text{SE} = 0.406$) but not statistically significant ($t = 1.048$, $\text{Sig.} = .295$), indicating that while CI may have a positive effect on sustainability, it does not significantly contribute to the model independently. The interaction term for Innovation \times CI has a coefficient of -0.360 ($\text{SE} = 0.082$), which is statistically significant ($t = -4.390$, $\text{Sig.} = .000$). This negative coefficient implies that as competitive intelligence increases, the positive impact of innovation on sustainability diminishes, suggesting that while innovation generally enhances sustainability outcomes, competitive intelligence may moderate this effect in a way that weakens it. Overall, these results indicate that competitive intelligence plays a significant moderating role in the innovation-sustainability relationship within family-owned businesses, emphasizing the complexity of how these factors interact and influence sustainable practices in this context.

H3: Business agility and strategic planning enhance innovation's impact on sustainability.

Multiple regression (Table 4) demonstrates significant positive contributions of business agility ($\beta = 0.148$, $p = .018$) and strategic planning ($\beta = 0.206$, $p = .003$), which, alongside innovation, explain 21% of the variance in sustainability ($R^2 = 0.210$).

Table 4: Model Summary and Coefficients for H3

Predictor	B	SE	β	t	Sig.
Constant	6.527	1.104		5.913	.000
Innovation	0.371	0.081	0.296	4.563	.000
Business Agility	0.249	0.105	0.148	2.379	.018
Strategic Planning	0.302	0.101	0.206	2.992	.003

Source: Survey 2024

Table 4 presents the model summary and coefficients for hypothesis H3, which investigates the influence of business agility and strategic planning on the relationship between innovation and sustainability. The constant term is 6.527 with a standard error (SE) of 1.104, and it is statistically significant ($t = 5.913$, $\text{Sig.} = .000$), indicating the baseline level of sustainability when both innovation and the other predictors are zero. The coefficient for innovation is 0.371 ($\text{SE} = 0.081$), suggesting a positive relationship with sustainability that is statistically significant ($t = 4.563$, $\text{Sig.} = .000$). This indicates that higher levels of innovation are associated with improved sustainability outcomes in family-owned businesses.

Additionally, the coefficient for business agility is 0.249 (SE = 0.105) with a t-value of 2.379 and a significance level of 0.018, highlighting that business agility also positively influences sustainability, albeit to a lesser extent than innovation. Similarly, the coefficient for strategic planning is 0.302 (SE = 0.101), which is statistically significant ($t = 2.992$, Sig. = .003), indicating that effective strategic planning contributes positively to sustainability outcomes as well. These results suggest that both business agility and strategic planning enhance the positive impact of innovation on sustainability in family-owned businesses, reinforcing the importance of these factors in achieving long-term sustainable development goals

Discussion of Findings

This study reinforces the pivotal role of innovation in driving sustainability outcomes in family-owned businesses, aligning with existing literature. Innovation enables firms to develop eco-friendly products, optimize resources, and implement sustainable business practices (Cainelli, De Marchi, & Grandinetti, 2015). For Nigerian family enterprises, which face intense competition and resource constraints, innovation fosters adaptability and intergenerational continuity (Trizotto et al., 2024).

Innovation and Sustainability

The results confirm H1, showing that innovation positively influences sustainability, accounting for 13% of its variance. This supports Schumpeter's (1934) theory that innovation underpins long-term business competitiveness. It is also consistent with Tidd and Bessant's (2020) assertion that innovation facilitates cleaner production methods and resource efficiency. Notably, family businesses are uniquely positioned to innovate due to their inherent flexibility and deep stakeholder ties (Adekunle & Omoregbe, 2022; Sharma & Sharma, 2024).

Moreover, the emphasis on sustainability reflects family enterprises' intergenerational priorities, where innovation is often geared toward preserving legacy rather than short-term profitability (Chrisman et al., 2005). This aligns with Cainelli et al. (2015), who found that eco-innovative firms outperform competitors in achieving sustainability goals, particularly in environmental performance and resource utilization. These results suggest that initiatives aimed at fostering innovation can meaningfully enhance sustainability outcomes in these enterprises. It reinforces the importance of innovation as a driver for achieving sustainable practices, thereby providing evidence for strategies that prioritize innovation to enhance sustainability outcomes.

Moderating Role of Competitive Intelligence (CI)

The findings also indicate that CI moderates the innovation-sustainability relationship but with a nuanced impact. While CI strengthens the connection by offering market insights, the interaction term's negative coefficient suggests that excessive focus on CI might dilute the sustainable orientation of innovation efforts. This contrasts with Wright's (2011) view that CI unambiguously enhances sustainable innovation but aligns with Calof and Wright's (2008) observation that overuse of CI may divert attention to competition rather than broader

organizational goals.

For family businesses, resource constraints might exacerbate this tension, as CI demands substantial investment in systems and expertise (Fleisher & Bensoussan, 2015). Nduka et al. (2020) emphasize the importance of aligning CI activities with core business strategies to ensure optimal resource allocation. Thus, while CI provides valuable insights, its effectiveness depends on its alignment with sustainability objectives. For family-owned businesses, this highlights the need to balance CI with innovation initiatives, ensuring that CI enhances rather than detracts from sustainable innovation practices.

Role of Business Agility and Strategic Planning

The positive effects of business agility and strategic planning on the innovation-sustainability relationship reflect the importance of dynamic capabilities in family businesses. Agility allows firms to adapt innovation strategies to evolving market demands and technological advancements, consistent with Overby et al.'s (2006) findings. This adaptability is particularly crucial for family-owned enterprises operating in volatile markets, as it mitigates risks and enhances competitiveness.

Strategic planning further strengthens the sustainability impact of innovation. Mintzberg (1994) argues that effective strategic planning enables businesses to anticipate future challenges and align resources accordingly. Dibrell, Craig, and Neubaum (2014) corroborate this, noting that firms with robust planning mechanisms achieve superior sustainability outcomes through innovation.

The integration of CI into strategic planning processes ensures that innovation efforts are well-informed and aligned with long-term objectives (Fleisher & Bensoussan, 2015). For instance, Carlos and Herrera (2021) found that CI-informed strategies enable firms to identify opportunities for eco-innovation, thereby enhancing sustainability outcomes.

Sustainability in Family Businesses

Family enterprises' unique orientation toward sustainability is rooted in their desire for longevity and legacy preservation. This aligns with Craig and Dibrell's (2006) observation that family firms prioritize intergenerational goals over immediate financial returns. Additionally, the findings highlight that innovation in family businesses often extends beyond product development to encompass cultural and operational shifts that support sustainable growth (Clauß, Kraus, & Jones, 2022).

However, family businesses must navigate resource limitations and organizational inertia, which can hinder the full realization of innovation's potential. By adopting CI selectively and emphasizing strategic planning, these firms can better balance short-term challenges with long-term sustainability objectives.

CONCLUSION

This study provides empirical evidence supporting the positive impact of innovation on sustainability in family-owned businesses, with competitive intelligence playing a significant

moderating role. The findings highlight the necessity for family firms to embrace innovative practices while leveraging CI to navigate complex market dynamics effectively.

Family-owned businesses have a unique opportunity to enhance their sustainability by fostering a culture of innovation supported by competitive intelligence. By adopting agile practices and strategic planning, these firms can not only achieve their sustainability objectives but also secure a competitive advantage in their respective markets. Future research should explore additional factors influencing this relationship and consider longitudinal studies to assess the long-term effects of innovation and competitive intelligence on sustainability outcomes in family-owned enterprises.

In conclusion, this study emphasizes the importance of innovation in generating sustainability in family-owned businesses and demonstrates how business agility and strategic planning strengthen this relationship. While innovation is critical for long-term sustainability, the capacity to adapt and strategically plan for future problems guarantees that organizations can prosper in a changing market environment. By embracing these qualities, family-owned businesses may protect their legacy and contribute to a more sustainable future. The findings suggest that family-owned businesses should prioritize innovation while complementing it with agility and strategic planning to maximize sustainability outcomes. The significance of all three predictors underscores the need for an integrated approach, where agility ensures adaptability, planning provides direction, and innovation drives sustainable progress.

Research Contributions

This study advances innovation theory by confirming that innovation drives sustainability in family-owned businesses, integrating environmental and economic objectives (Cainelli, De Marchi, & Grandinetti, 2015). It also extends dynamic capabilities theory by illustrating how strategic planning and agility enhance the sustainability impact of innovation, particularly in family business contexts (Teece et al., 1997). Additionally, the research bridges empirical gaps by examining the interplay between innovation, organizational behavior, and sustainability, providing insights into how family enterprises can leverage their unique attributes to navigate dynamic markets effectively.

Limitations and Future Research

This study has several limitations that offer opportunities for future research. The cross-sectional design limits the ability to establish causal relationships, suggesting the need for longitudinal studies to track how innovation, agility, and competitive intelligence (CI) evolve to influence sustainability. The reliance on self-reported data introduces potential biases, such as social desirability bias, which could be mitigated by incorporating objective measures like financial performance or third-party sustainability assessments. While the moderating role of CI was explored, its nuanced impact warrants further investigation, particularly regarding how different types of CI (e.g., market or competitor intelligence) interact with innovation processes (Fleisher & Bensoussan, 2015). Additionally, the study's geographic and sectoral focus on Lagos limits generalizability; expanding research to other regions and industries would provide

a more comprehensive understanding of innovation-sustainability dynamics.

Future research should explore several areas to deepen the understanding of innovation and sustainability in family businesses. Longitudinal studies are needed to investigate how innovation and agility influence sustainability over time, particularly in response to market disruptions. Research could also examine the differentiated impacts of various competitive intelligence (CI) types, such as technological, competitor, and customer intelligence, on innovative strategies. Comparative studies between family and non-family businesses would help identify unique sustainability drivers in each context. Additionally, sectoral and regional analyses can uncover contextual factors shaping the innovation-CI-sustainability relationship. Finally, interdisciplinary approaches integrating psychology, sociology, and organizational behavior can provide valuable insights into how family dynamics influence sustainable innovation adoption.

Recommendations with Prioritization and Implementation Plan

Based on the findings of this study, prioritized and actionable recommendations are proposed for family-owned businesses and policymakers. This is presented in Table 5.

Table 5: Actionable Recommendations with Timeline

Recommendations	Actionable Steps	Timeline
For Family-Owned Businesses		
1. Develop an Innovation Culture	<ul style="list-style-type: none"> - Establish dedicated innovation teams or roles to oversee sustainability initiatives. - Allocate 10-15% of annual budgets to eco-friendly R&D. - Conduct quarterly workshops to promote experimentation and new technology integration. 	Begin resource allocation within 6 months, with training rollout within 1 year.
2. Enhance Organizational Agility	<ul style="list-style-type: none"> - Implement agile decision-making frameworks (e.g., daily stand-ups). - Train leadership on adaptive strategies through certified agility workshops. - Introduce flexible organizational structures to improve decision-making. 	Start agility assessments within 3 months, structural revisions within 1 year.
3. Incorporate Sustainability into Strategic Planning	<ul style="list-style-type: none"> - Integrate sustainability metrics (carbon footprint, resource efficiency) into KPIs. - Align innovation projects with SDG 12 in strategic documents. - Conduct bi-annual reviews to ensure long-term alignment with sustainability goals. 	Update planning documents and begin sustainability reviews within 6 months.

4. Leverage Competitive Intelligence (CI)	<ul style="list-style-type: none"> - Use analytics tools (SWOT, PESTEL) to monitor market trends. - Develop a CI dashboard to track competitor and customer insights. - Train employees on CI tools in departments like marketing and R&D. 	<p>Launch CI dashboard within 3 months, complete employee training within 9 months.</p>
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For Policymakers

1. Provide Incentives for Sustainable Innovation	<ul style="list-style-type: none"> - Offer tax rebates for adopting renewable energy or reducing emissions. - Establish R&D grants for eco-innovation, prioritizing high-impact sectors. - Create a sustainability certification program for family enterprises. 	<p>Introduce tax rebates and certification programs within 1 year.</p>
2. Support CI and Strategic Capacity Building	<ul style="list-style-type: none"> - Organize industry-wide CI workshops focused on sustainability. - Fund training for small businesses on integrating sustainability into strategic planning. - Develop publicly accessible CI tools and resources. 	<p>Conduct workshops within 6 months, roll out public resources within 1 year.</p>
3. Create Sector-Specific Guidelines	<ul style="list-style-type: none"> - Collaborate with trade associations to draft detailed industry-specific sustainability guidelines. - Publish annual reports on best practices and benchmarks. - Establish a task force to monitor compliance and offer advisory support. 	<p>Launch guidelines and compliance frameworks within 18 months.</p>

The recommendations for family-owned businesses and policymakers are presented with clear, actionable steps and timelines. Family businesses should prioritize innovation by dedicating resources to eco-friendly R&D, fostering organizational agility through flexible decision-making and leadership training, and integrating sustainability into strategic planning with bi-annual reviews. They should also leverage competitive intelligence (CI) by utilizing analytics tools, creating a CI dashboard, and training staff. Policymakers should incentivize sustainable innovation through tax rebates, R&D grants, and certification programs while supporting capacity-building through CI workshops and publicly accessible tools. Additionally, they

should develop sector-specific sustainability guidelines, publish annual reports, and establish a compliance monitoring task force. These steps are to be implemented in phases over the next 18 months, ensuring family businesses remain competitive and aligned with sustainability goals.

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