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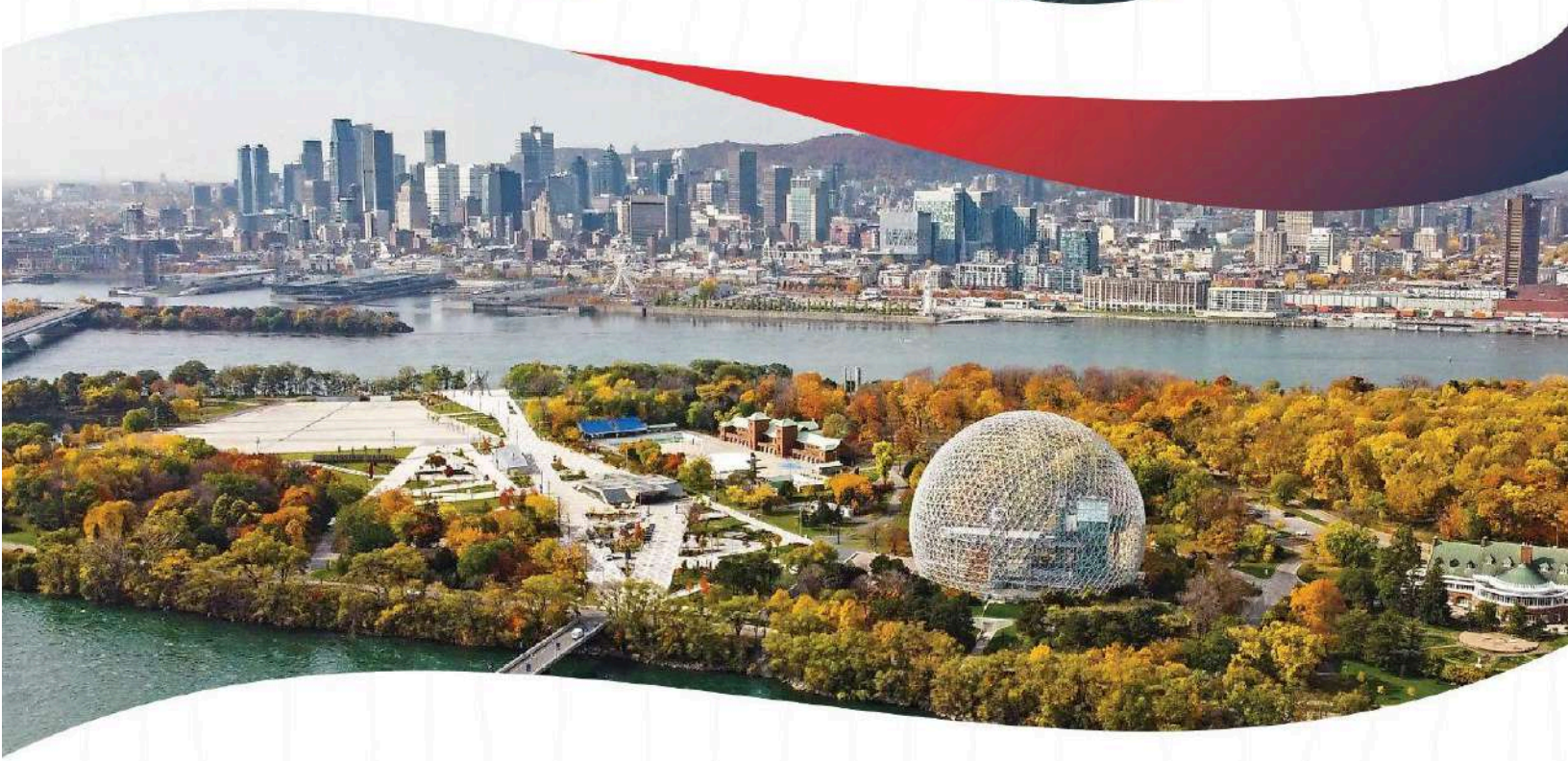

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Maalem Toufik(Author) *University of Batna 2* **Derradji Lazhar and Merzouki Tarek(Co-Author)**	**Strain-Based Finite Element for Static and Dynamic Analysis of Plates: ABAQUS Implementation of a Hexahedral 8-Node 3D Element**

Abstract

In this work, a robust 8-node hexahedral finite element, based on the strain approach, is used to model the static and dynamic behavior of isotropic plates, both thin and thick. This element, initially programmed in FORTRAN, had previously demonstrated its capacity to overcome locking issues in the bending of thin structures. Here, its implementation into the commercial software ABAQUS -via the user-defined element subroutine (UEL)- is revisited and applied to a series of dynamic simulations. The use of ABAQUS not only broadens the scope of applications but also significantly reduces the programming effort required, while showcasing the modeling capabilities of the element in practical scenarios. The results obtained outperform those of native ABAQUS elements and other elements in the literature with the same number of nodes. Based on these observations, new perspectives for further improvements are proposed.

Key words: Strain approach, plate bending, implementation, SBH8, ABAQUS.

1. Introduction

The development of finite elements based on strain formulations has significantly advanced the numerical modeling of structural problems, particularly in the analysis of plate bending and vibrations. Compared to classical displacement-based elements, strain-based models are more effective in addressing numerical issues such as shear locking, which often arises in the simulation of thin plates.

In recent years, several innovative non-conforming elements relying on strain-based formulations have been introduced, with encouraging results reported in both static and dynamic contexts [Abderrahmani, 2023; Belounar et al., 2023; Chichoune and Rebiaï, 2023 Belounar and Belounar, 2025]. However, despite their theoretical advantages, most of these elements remain limited to academic use, as their integration into commercial finite element platforms is often overlooked due to implementation complexity.

In this context, the present work revisits an eight-node hexahedral element originally formulated in a standalone Fortran environment [Belarbi and Charif, 1999; Maalem 2011]. A first implementation of this element within ABAQUS was reported in a previous study (Derradji et al., 2021), demonstrating the feasibility of using User Element (UEL) subroutines to introduce strain-based formulations into commercial software.

The current communication builds upon that foundation by providing a renewed evaluation of the element's performance within ABAQUS. The integration not only simplifies the modeling process but also makes it possible to perform extensive simulations, particularly in the field of free vibration analysis of thin and thick isotropic plates. The numerical results confirm the robustness and accuracy of the element, surpassing both standard ABAQUS elements and other published models with the same nodal configuration.

Additionally, recent developments have extended the application of new developed element to more complex configurations, such as plates with openings, an area that remains relatively unexplored in the literature. These extensions, currently under review for journal publication, further reinforce the practical relevance of strain based approaches when embedded into commercial codes.

2. Description of the Hexahedral Element SBH8

The element under study is a standard isoparametric hexahedron with eight nodes, as originally proposed by Belarbi and Charif (1999). Each node possesses three translational degrees of freedom, resulting in a total of 24 degrees of freedom for the element (see Figure 1).

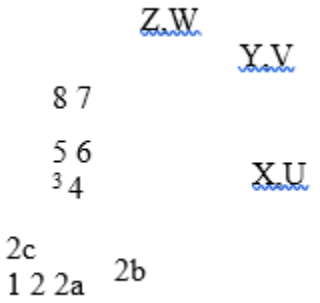

Fig 1.Geometry of the SBH8 element.

3. Theoretical formulation

3.1 Displacement field assumptions

In a full three-dimensional analysis, six independent strain-displacement

relationships are considered: $\varepsilon xx = U, x\ \gamma xy = U,y + V,_x$ (1a, b)

$$\varepsilon yy = V, y\ \gamma yz = V,z + W, y \quad (1c, d)$$

$$\varepsilon zz = W, z\ \gamma xz = W,x + U,z \quad (1e, f)$$

Here, U, V, and W represent the displacement components along the X, Y, and Z axes, respectively. The conditions associated with rigid body motion (R.B.M), are given by:

$$\varepsilon_{ii} = 0 \quad (2a)$$

$$\gamma_{ij} = 0 \quad (2b)$$

Integrating these conditions yields the particular solution corresponding to rigid body motion:

$$U_R = a_1 + a_4 y + a_6 z \quad (3a)$$

$$V_R = a_2 - a_4 x - a_5 z \quad (3b)$$

$$W_R = a_3 + a_5 y - a_6 x \quad (3c)$$

These expressions define the rigid body displacement field. The full displacement field involves 24 independent constants. Among them, six (a_1 through a_6) are assigned to describe rigid body motion, while the remaining eighteen (a_7 through a_{24}) approximate the strain field within the element. The formulation is based on a strain approach, where the strain field is directly approximated, rather than being derived from displacements.

The strain components are assumed in the following form:

$$\varepsilon_{xx} = a_7 + a_8 y + a_9 z + a_{10} yz \quad (4a)$$

$$\varepsilon_{yy} = a_{11} + a_{12} x + a_{13} z + a_{14} xz \quad (4b)$$

$$\varepsilon_{zz} = a_{15} + a_{16} x + a_{17} y + a_{18} xy \quad (4c)$$

$$\gamma_{yz} = a_{19} + a_{20} x \quad (4d)$$

$$\gamma_{xz} = a_{21} + a_{22} y \quad (4e)$$

$$\gamma_{xy} = a_{23} + a_{24} z \quad (4f)$$

By substituting (4) into (1), solving the resulting differential equations, and superimposing the rigid body motion components from (3), we obtain the complete displacement field:

$$U = a_1 + a_4 y + a_6 z + a_7 x + a_8 xy + a_9 xz + a_{10} xyz - 0.5a_{12} y^2 - 0.5a_{14} y^2 z - 0.5a_{16} z^2 - 0.5a_{18} yz^2 + 0.5a_{21} z + 0.5a_{23} y + a_{24} yz \quad (5a)$$

$$V = a_2 - a_4 x - a_5 z + a_{11} y + a_{12} xy + a_{13} yz + a_{14} xyz - 0.5a_8 x^2 - 0.5a_{10} x^2 z - 0.5a_{17} z^2 - 0.5a_{18} xz^2 + 0.5a_{19} z + 0.5a_{23} x + a_{20} xz \quad (5b)$$

$$W = a_3 + a_5 y - a_6 x + a_{15} z + a_{16} xz + a_{17} yz + a_{18} xyz - 0.5a_9 x^2 - 0.5a_{10} x^2 y - 0.5a_{13} y^2 - 0.5a_{14} xy^2 + 0.5a_{19} y + 0.5a_{21} x + a_{22} xy \quad (5c)$$

This displacement field is constructed to satisfy the compatibility conditions expressed by:

$$\varepsilon_{ij,kl} + \varepsilon_{kl,ij} - \varepsilon_{ik,jl} - \varepsilon_{jl,ik} = 0 \quad (6)$$

In matrix form, the displacement field (5) becomes:

$$\{u\}=[C_u]\ \{a\}\ (7)$$

where $\{u\}$ is the displacement vector, $[C_u]$ is a matrix of monomials x, y, and z, and $\{a\}$ is the vector of unknown coefficients. Evaluating (7) at the nodal coordinates yields:

$$\{q_e\}=[A]\ \{a\}\ (8)$$

[A] is the element matrix of the nodal coordinates.

Solving for $\{a\}$:

$$\{a\}=[A]^{-1}\ \{q_e\}\ (9)$$

Substituting into (7):

$$\{u\}=[C_u]\ [A]^{-1}\ \{qe\}=[N]\ \{qe\}\ (10)$$

Here, [N] is the shape function matrix. Differentiating equation (10) provides the strain field: $\{\varepsilon\}=[B]\ \{qe\}\ (11)$

Where [B] is the strain-displacement matrix

3.2. Variational Formulation and Governing Equations

The total potential energy is given by:

$$\Pi=U-W\ (12)$$

with U being the strain energy and W the external work. Applying the principle of minimum potential energy, the element stiffness and mass matrices are expressed as:

$$[Ke]=\iiint_v [B]^T[D]\ [B]\ dx\ dy\ dz\ (13a)$$

$$[Me]=\rho\ (\iiint_v [N]^T[N]\ dx\ dy\ dz)\ (13b)$$

Here, [D] is the constitutive matrix for isotropic linear elasticity, ρ is the material density. Both [Ke] and [Me] are 24×24 matrices

The global equilibrium of the structure leads to the following system of equations:

$$[K]\{q\}=\{F\} \quad (14a)$$

$$[K]\{q\}-\omega^2[M]\{q\}=\{0\} \quad (14b)$$

Where $\{q\}$ is the global displacement vector, $[K]$ and $[M]$ are the global stiffness and mass matrices, $\{F\}$ is the global load vector and ω is the natural frequency.

4. Numerical Results

Several types of finite elements are employed for the numerical analysis, including:

· ABAQUS elements :

- **C3D8**: a standard first-order hexahedral element with eight nodes, using exact numerical integration.

- **C3D8I**: an enhanced eight-node hexahedral element incorporating thirteen incompatible modes to alleviate transverse shear and Poisson locking effects.

- **C3D20**: a second-order hexahedral element with twenty nodes and exact numerical integration.

· **SBBNN**: a strain-based brick element with nine nodes, proposed by Messai et al. (2019). · **SFR8**: an eight-node hexahedral element developed on the basis of the space fiber rotation concept, introduced by Ayad et al. (2013).

4.1. Static Analysis

a. Cantilever Beam under In-Plane Bending

This test examines a cantilever beam subjected to a pure bending moment M=2000, with the objective of evaluating the element's sensitivity to mesh distortion. As illustrated in the following figure, the beam is discretized using two brick elements with an eccentricity parameter e $\in$ [0,4.9], as proposed by Piltner and

Taylor (1995). The geometry of the elements varies according to the distortion level: when e=0, the elements are regular hexahedra; increasing e introduces growing distortion.

The vertical displacement at point A is normalized by dividing the computed displacement by a reference value. The reference vertical displacement at the free end is set to 100, and the corresponding results are reported in Table 1.

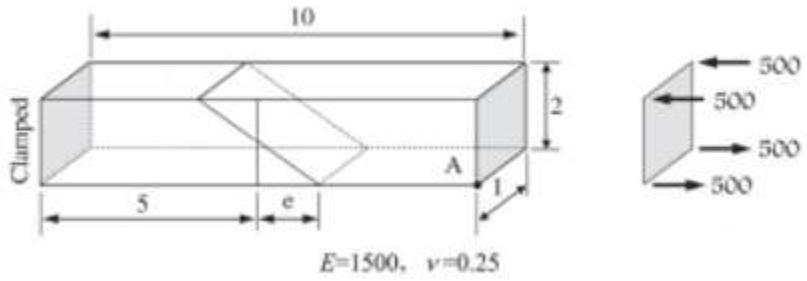

Fig2. Cantilever beam representation using two distorted finite elements

Table1. Normalized vertical displacement at the free end of the cantilever beam.

e	SBBNN	C3D8	C3D8I	C3D20	SBH8
0	0.983	0.339	0.987	0.970	**0.983**
0.5	0.983	0.270	0.588	0.974	**0.983**
1	0.981	0.183	0.341	0.977	**0.982**
2	0.975	0.117	0.256	0.867	**0.977**
3	0.966	0.095	0.272	0.524	**0.969**
4	0.960	0.079	0.298	0.267	**0.964**
4.9	0.957	0.066	0.312	0.171	**0.963**

The SBH8 element displays excellent accuracy even under severe mesh distortion. Its performance exceeds that of ABAQUS's standard 8-node (C3D8) and 20-node (C3D20) elements, especially in distorted configurations. Its internal interpolation functions and integration schemes were designed to mitigate locking effects and provide robustness against mesh distortion. The element has shown particular promise for plate and shell modeling, especially for bending-dominated problems.

b. Simply Supported Square Plate with Central Load

A simply supported square plate under a concentrated load applied at its center is considered, as shown in Figure 3. This benchmark example has been previously studied by Andelfinger and Ramm (1993), Areias et al. (2003), and Ayad et al. (2013). Owing to the symmetry of the geometry and loading, only one quarter of the plate is modeled using a structured mesh. The transverse reference displacement at the center, calculated using Kirchhoff's classical plate theory, is taken as unity. The numerical results obtained are compiled in Table 2.

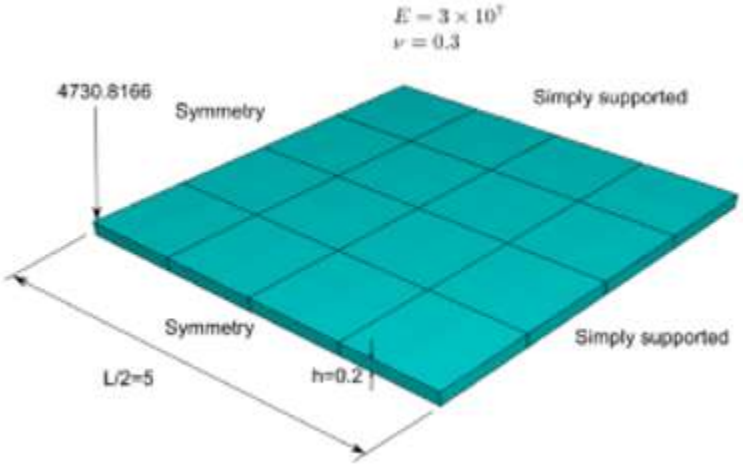

Fig3.Simply supported square plate.

Table 2.Normalized transverse displacement at the center of simply supported square plate

N	SBBN N	SFR8	C3D8I	C3D20	SBH8
2	0.753	0.266	0.399	0.868	**0.753**
4	0.929	0.423	0.908	0.978	**0.929**
8	0.989	0.558	0.999	1.007	**0.989**
16	1.009	0.707	1.012	1.017	**1.009**

The element provides high precision even with a coarse mesh (16 elements), outperforming other elements with similar degrees of freedom.

c. convergence test on circular plate

This test investigates the ability of the proposed element to overcome shear locking effects. A circular plate of radius R=5, thickness t=0.1, Young's modulus E=10.92, and Poisson's ratio ν=0.3 is subjected to a central concentrated load. Two boundary conditions are considered: simply supported and fully clamped edges. Due to the axial symmetry of the configuration, only one quarter of the plate is modeled. Four mesh densities are employed, consisting of 12, 48, 108, and 192 elements, as depicted in Figure 4. The transverse reference displacement at the center is computed based on Kirchhoff's theory.

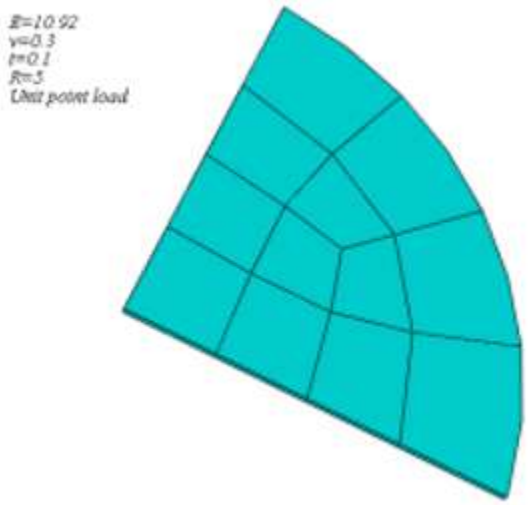

Fig.4. Finite element mesh of a circular plate comprising 12 elements.

Table3. Normalized central transverse displacement of the plate

Boundary	N	SBBNN	C3D8	C3D8I	C3D20	SBH8	(Timoshenko &W,1959)
supports	12	0,875	0,021	0,755	0,964	**0,873**	**5.050**
Simple	48	0,976	0,080	0,969	0,991	**0,976**	

	108	0,992	0,172	0,991	0,997	**0,992**	
	192	0,996	0,292	0,997	0,999	**0,996**	
Clamped	12	0,572	0,021	0,605	0,827	**0,568**	**1.989**
	48	0,914	0,080	0,940	0,964	**0,914**	
	108	0,968	0,175	0,983	0,986	**0,968**	
	192	0,984	0,297	0,994	0,993	**0,984**	

For both simply supported and clamped boundary conditions, the SBH8 element demonstrates a high convergence rate. In refined meshes (e.g., 192 elements), results closely match those of the C3D20 element.

4.2. Free Vibration Analysis

a. Thin Rectangular Plate (L/h = 50 and 100)

In this example, the transverse free vibration behavior of a simply supported thin rectangular plate is analyzed. Figure 5 presents the geometry and material properties used in the model. The plate is discretized with a regular finite element mesh. The analytical expressions for the transverse natural frequencies are given by:

$$f_{mn} = \frac{\pi}{2(} m^2$$

$$L^{2} + n^2$$

$$f_{mn} = \frac{\pi}{2}\left(m^2 \left(\frac{}{L^2}\right) + n^2 \left(\frac{}{l^2}\right)\right) \sqrt{\frac{D}{\rho h}}$$

$$= \frac{Eh^3}{12(1-\nu^2)} D \quad ( )$$

Where D is the flexural rigidity of the plate.

(Table.4) summarizes the obtained results.

Fig.5. Finite element model of a simply supported thin rectangular plate using 8 × 4 × 1 hexahedral elements.

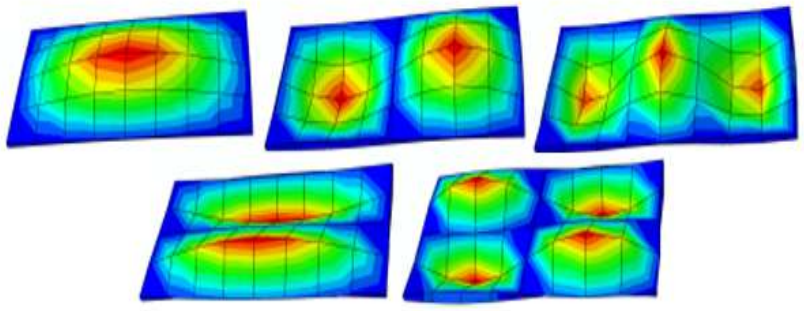

Fig.6.First five natural vibration modes of the rectangular plate.

Table 4. First five transverse natural frequencies of the rectangular plate

	C3D8	C3D8I	C3D20	SBBNN	SFR8	SBH8	ANALYT. SOLUT.
L/h=50							
f11	72.821	25.149	23.961	25.062	26.447	**26.590**	**23.767**
f21	96.968	42.270	38.183	41.026	41.856	**43.565**	**38.027**
f31	165.57	71.879	63.087	70.536	69.172	**75.076**	**61.794**
f12	277.57	93.762	86.211	93.949	96.68	**100.20**	**80.808**
f22	273.66	117.73	100.1	115.94	110.34	**124.07**	**95.068**
L/h=100							
f11	71.737	14.835	12.096	12.703	13.296	**13.481**	**11.883**
f21	95.073	28.774	19.437	21.211	21.136	**22.537**	**19.013**
f31	163.32	52.003	32.63	38.967	35.129	**41.535**	**30.897**
f12	276.39	56.994	44.527	50.096	49.094	**53543**	**40.404**
f22	271.94	88.053	52.889	67.377	56.909	**72.370**	**47.534**

For thin plates, the SBH8 element delivers results comparable to advanced elements like C3D8I and SFR8, outperforming the standard C3D8 and avoiding locking effects. For higher slenderness ratios (L/h = 100), its superiority becomes more pronounced.

b. Thick Square Plates (CCCC and CSSF boundary conditions)

This section focuses on the transverse free vibrations of a thick square plate, as illustrated in Figure 7. Two boundary conditions are examined: (1) all edges clamped (C–C–C–C), and (2) a mixed configuration with two simply supported edges, one clamped edge, and one free edge (C–S–S–F).

Fig.7. Finite element model of a thick square plate using 8 × 8 × 1 hexahedral elements.

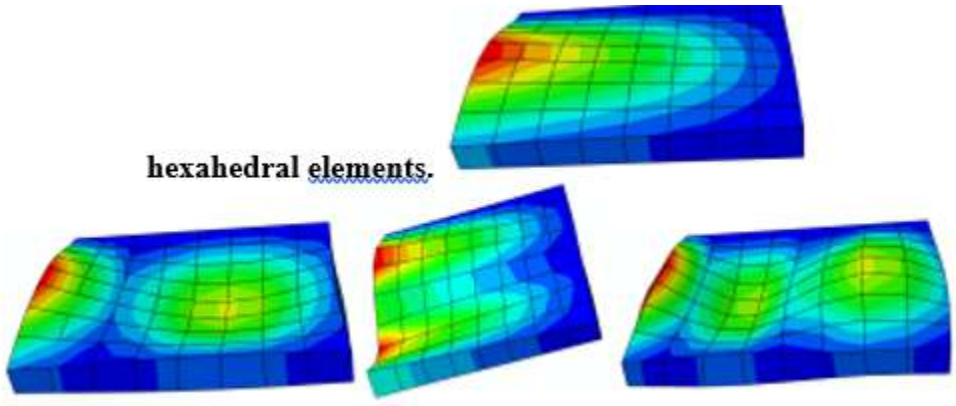

Fig.8. First four natural vibration modes of the thick square plate (CSSF).

Table 5. First four transverse natural frequencies of the thick square plate

	C3D8	C3D8I	C3D20	SBBNN	SFR8	SBH8	(Liew, Xiang, & K, 1993)
CCCC							

f11	75.385	78.636	81.431	82.46	88.894	**87.187**	**78.322**
f12=f21	145.25	150.11	156.46	157.87	172.77	**166.27**	**149.396**
f22	187.73	199.97	219.53	220.76	241.53	**231.64**	**209.384**
CSSF							
f11	38.095	38.539	38.933	39.266	41.650	**41.527**	**38.491**
f12	61.311	65.884	69.098	68.847	74.282	**72.463**	**69.317**
f21	112.07	112.09	113.79	112.83	124.09	**118.70**	**110.783**
f13	120.5	126.41	138.08	133.66	151.07	**151.69**	**137.077**

In thick plate scenarios, the SBH8 element offers results that are at least as accurate as those of the SFR8 element. For plates with rotational degrees of freedom, it remains competitive, with a favorable balance between precision and computational efficiency.

5. Conclusions

This study has explored the static and dynamic behavior of an eight-node hexahedral finite element developed within a strain-based framework. Each node of the proposed SBH8 element carries the three translational degrees of freedom typical of 3D solid formulations. Originally implemented in Fortran, the element has been successfully integrated into ABAQUS through the UEL subroutine, significantly broadening its scope of application by leveraging the capabilities of a widely used commercial code.

The numerical results confirm the accuracy, stability, and convergence properties of the element in the static analysis of both thin and thick isotropic plates. In free vibration simulations, particularly for thin plates, where numerical locking is often a critical issue, the element performed remarkably well, frequently outperforming standard ABAQUS elements with the same nodal configuration. For thicker plates, the results remained highly competitive.

These findings underscore the practical viability of strain-based formulations when implemented in a commercial environment. By bridging the gap between theoretical development and engineering application, the present work demonstrates the potential of advanced finite elements to be adopted in real-world modeling scenarios, especially when embedded in flexible platforms such as ABAQUS.

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Odulawa Omolade Adebimpe(Author) *Xero* **Raphael Olaniyi(Co-Author)** *Rise Air*	**The Role of Leadership and Transparency in the Implementation of Corporate Sustainability in Strategic Management**

1.0 Introduction

Scholars, practitioners, and regulatory bodies have shown growing interest in the adoption of corporate sustainability (CS) following the publication of the Brundtland report in 1987 (Huang & Watson, 2015; Maon et al., 2009). The companies that actively participate in corporate sustainability, as discussed by Lueg et al. (2013), are those that integrate social and environmental responsibility as fundamental components of their business models, as highlighted by Harrison et al. (2019). The term "corporate" is capitalised in the context of corporate social responsibility (CSR) to underscore the extensive range of the concept, encompassing all entities that possess even minimal capacity to impact economic outcomes. This statement serves to underscore the notion that every individual possesses the right to express their opinion on this subject matter, regardless of their status or position. The consideration of efforts made by organisations that aim to benefit society as a whole may be subject to variability and not necessarily guaranteed. According to Margolis et al. (2009), Corporate Sustainability (CS) plays a crucial role in ensuring the long-term viability of a competitive advantage in the market, leading to enhanced economic performance. The field of Corporate Sustainability (CS) promotes the principles of transparency and accountability, as evidenced by studies conducted by López-Pérez et al. (2017) and Ostrom (1990). Additionally, CS emphasises the optimisation of resource utilisation in terms of efficiency and effectiveness, as highlighted by the research of Lueg and Radlach (2016). Nevertheless, the implementation of integration has not been apparent in the field of strategic management. The lack of accountability among multinational conglomerates has resulted in adverse impacts on global warming and climatic conditions.

Various sources, such as the United Nations Environment Programme (2013), the Global Reporting Initiative (2013), and the Intergovernmental Panel on Climate Change (2014), have indicated that business environments are experiencing significant and swift transformations, necessitating ongoing efforts to safeguard the Earth and its inhabitants.

Given the prevailing circumstances, there is an observable trend towards the emergence and proliferation of environmentally conscious enterprises (Moon, 2007; Baumgartner, 2014). Nevertheless, the progress of companies has also been impeded. However, there is an increasing agreement among managers that incorporating corporate sustainability into strategic planning is crucial (Kiron et al., 2012; Kiron et al., 2015), a factor that is often overlooked. However, an effective approach for adapting to these transformations involves integrating sustainability into corporate strategies and processes. Scholars have shown a growing interest in the incorporation of corporate sustainability into a company's strategy, vision, and culture in recent years (Stead and Stead, 2000; Jin and Bai, 2011).

The existing body of scientific literature indicates that there exist multiple approaches to the process of integration. Siebenhüner and Arnold (2007) argue that to transition towards a more sustainable mindset, it is imperative to embrace resource-efficient technologies, offer environmentally friendly goods and services, and implement sustainability reporting schemes while moving away from a market-profit orientation. Nathan (2010) presents an extended analysis of Galbreath's (2006) research, proposing a comprehensive framework for the incorporation of corporate sustainability within the context of business strategy. The author suggests the integration of environmental and societal considerations into comprehensive business strategies. The incorporation of corporate sustainability (CS) into the routine activities

and overarching strategic plans of an organisation is widely recognised as a challenging undertaking (Baumgartner, 2009; Oertwig et al., 2017). Consequently, it is often imperative to implement not only one but frequently multiple substantial modifications (Uhl-Bien & Arena, 2018). Asswad et al. (2016) and de Medeiros et al. (2014) have posited that the attainment of success or failure in the integration of corporate sustainability (CS) is contingent upon several factors, namely barriers, drivers, and key factors.

Organisations aiming to enhance their performance concerning relevant stakeholders should prioritise the initial phase of the corporate sustainability integration process. This phase involves acquiring a comprehensive understanding of the skills that need to be cultivated to foster sustainable development. This notion is supported by scholarly works such as those by Horisch et al. (2014), Rodrigue et al. (2013), Dyllick and Hockerts (2002), and Testa et al. (2018). The cultivation of a proactive organisational culture is of utmost importance in shaping the cognitive, behavioural, and affective responses of employees towards sustainability-related matters (Baumgartner, 2014; Warrick, 2017). The incorporation of this culture ought to serve as a catalyst for the company's endeavours in tackling these issues. To determine the appropriate sustainability-oriented initiatives to be implemented, the leadership should possess the requisite knowledge, experience, and expertise (Husted and Sousa-Filho, 2017; Stakeholder Engagement Framework, 2017). This enables them to make informed decisions regarding the selection, rationale, and allocation of responsibilities for such initiatives.

When a company undertakes measures to enhance its environmental management practices, it tacitly assumes, without explicit declaration, that its management and employees are already conforming to the optimal standards of environmental

responsibility. This assumption can be considered audacious; nevertheless, it is based on the premise that a significant number of employees may possess limited awareness regarding sustainability matters that transcend their immediate job responsibilities. Transparency, as a fundamental element, plays a crucial role in the successful implementation of corporate sustainability integrations.

This paper aims to provide a comprehensive analysis of the integration of corporate sustainability into strategic management, presenting a thorough examination of the results obtained. Through a comprehensive examination of prior scholarly investigations and review of companies' sustainability reports, this review elucidates the present understanding of the subject matter, discerns instances of corporate unsustainability within the realm of business, and imparts valuable perspectives regarding the impact of leadership and the degree of transparency in facilitating the successful incorporation of sustainability into strategic management methodologies. This study aims to examine the potential long-term impact of Corporate Sustainability, or the absence thereof, on the triple bottom line.

This review aims to enhance comprehension regarding the effective integration of corporate sustainability into strategic management within organisations. By doing so, it supports the advancement of sustainable business models that are in line with environmental and social imperatives. Additionally, this practice would facilitate the identification of deficiencies within the existing body of literature, enabling researchers to propose potential avenues for future research. Consequently, this would promote continued dialogue and the progression of knowledge within this field.

1.1 Aim of Study

The main objective is to compile a dataset that showcases the extent to which major corporations are transparent in their strategic management of corporate sustainability, as well as the specific roles that leaders assume in this process.

1.2 Objectives of Study

1. Identifying key concepts and definitions

2. Investigating the role of leadership and transparency in Corporate Sustainability

3. Investigating the degree of transparency in a large corporation

4. Exploring how leadership and transparency interact to influence the successful implementation of corporate sustainability initiatives.

5. Identifying gaps in current knowledge and suggesting avenues for future research.

1.3 Significance of Study

This review holds significant importance for both academia and practitioners in the field of corporate sustainability in strategic management. Understanding how organisations are transparent about implementing corporate sustainability within their strategic decision-making processes is crucial for developing sustainable business models. The findings of this study will provide insights into the integration of sustainability principles and practices and the influence of transparency and leadership among stakeholders, allowing organisations to address challenges associated with the triple bottom line.

1.4 Research Questions

To accomplish the objectives mentioned above, the following research question will be addressed:

To what extent are large corporations transparent about their sustainability performance and the role of leadership in implementing it?

1.5 Scope of Study

This scope of the study will cover a thorough analysis of the complex interplay between leadership, transparency, and corporate sustainability in the realm of strategic management. This research will explore various sectors and industries, gathering valuable insights from both well-established corporations and emerging enterprises. The research endeavours to assess the level of transparency exhibited by large corporations in their efforts to uphold and execute corporate sustainability through the practice of sustainability reporting, employing a multidimensional approach.

Within the realm of leadership, this study aims to investigate different styles of leadership, such as transformational, transactional, and ethical leadership, to determine their individual effects on the incorporation of sustainable practices. The assessment will encompass an analysis of leadership behaviours, competencies, and decision-making processes that are in line with long-term sustainability goals. The examination of transparency will encompass various aspects, including transparent reporting, communication strategies, stakeholder engagement practises, and the extent to which organisations disclose their environmental, social, and governance (ESG) performance.

1.6 Dissertation Structure

Chapter 1 would provide a foundation for the entire dissertation. It introduces the research topic, highlights its significance, and articulates the research aim and objectives and the scope of the study.

Chapter 2 delves into a critical review of existing literature related to leadership, transparency, and corporate sustainability. It explores the theoretical underpinnings, conceptual frameworks, and empirical evidence that underlie the relationship between these dimensions.

Chapter 3, the methodology chapter outlines the research design, data collection methods, and analytical approaches used in the study. It justifies the chosen research methods and provides a rationale for the selection of data sources and case studies. The chapter also discusses the ethical considerations, inclusion and exclusion criteria, and strategies employed to ensure the rigour and validity of the research.

Chapter 4 will present the findings of the review and case studies undertaken in the study.

Chapter 5, the discussion chapter will analyse and interpret the research findings.

Chapter 6 synthesises the study's key insights, contributions, and implications. It reiterates the research aim and objectives, summarizing the main findings and their significance for both academia and practice.

2.0 Literature Review

2.1 Definition of Concepts

Corporate Sustainability (CS) is a concept that encompasses the incorporation of economic, environmental, and social considerations into the structures and procedures of corporate decision-making, as outlined by Vardari et al. (2020). The primary aim of this initiative is to promote sustainable development, reduce risks, and maximise value for all parties involved (Lee, 2019). The organisational capacities of an organisation have a significant impact on its strategic dimension, whereas its operational dimension is determined by its socio-environmental practices. The interconnection and mutual support between these two aspects create a synergistic relationship for the organisation (Mohammadi et al., 2018).

Leadership encompasses a variety of behaviours that are utilised to foster the convergence of individuals towards a shared objective, the efficient execution of strategic endeavours, and the continual rejuvenation of an organisation. In the realm of organisational dynamics, leaders undertake a multifaceted role that extends beyond their mere position or title. The contributions made by the individual encompass a diverse set of skills and abilities, which include forward-thinking, strategic planning, meticulous operational management, and the capacity to adeptly adapt to dynamic circumstances.

Strategic management pertains to the intentional actions and choices made by organisational leaders to direct and navigate the entity towards its long-term objectives, while concurrently striving to achieve a competitive advantage within a highly competitive market setting. Organisations commonly adopt a managerial approach known as "strategic alignment" to improve their capacity to adapt to

changing conditions, overcome challenges, and achieve desired objectives. The aforementioned process involves the development, implementation, and evaluation of strategies to achieve these objectives.

The assessment of transparency can be carried out by utilising the criteria established by Rawlins (2008). From a scholarly standpoint, transparency is defined as the act of revealing all information that is legally allowed to be accessible to the general public. The four fundamental elements can be outlined as follows: (1) the frequency of reporting; (2) the Level of implementation; (3) third-party comment or receptivity to feedback from the audience; and (4) the inclusion of an independent assurance statement. Transparency encompasses the acceptance of both positive and negative feedback, along with the recognition of both commendation and critique (Rasche et al., 2017). Moreover, it encompasses the task of ensuring accessibility for stakeholders who articulate a requirement for supplementary information (Holladay and Coombs, 2013). Furthermore, as highlighted by Rawlins (2008), authentic communication plays a crucial role in

transparency initiatives, thereby enhancing the organization's credibility among its stakeholders.

2.2 Corporate Sustainability Integration into Strategic Management

The notion of corporate sustainability has garnered renewed attention over the past two decades, following a robust exchange between Berle and Dodd in the Harvard Law Review. There is a growing perception among stakeholders that shareholders are increasingly favouring corporations that adopt proactive measures and provide comprehensive disclosures regarding their efforts to improve their social and environmental performance. The research efforts in the field of corporate sustainability

face significant challenges, primarily due to its interdisciplinary nature and the lack of a consensus on key terms (Lindgreen et al., 2009; Aguinis and Glavas, 2012). The academic disciplines that contribute to our understanding of corporate sustainability encompass a diverse array of fields. Scholars within the field of accounting frequently emphasize the examination of auditing practises and the exploration of theories about non-financial reporting (Gray et al., 1995; Berthelot et al., 2003; Nitkin and Brooks, 1998). On the other hand, researchers in the discipline of management analyse a range of theories about organisations, as demonstrated by the scholarly contributions of Benn (2012), Matten and Crane (2005), McWilliams and Siegel (2001), and Garriga and Mele (2004). In contrast, the scholarly community within the field of law directs its attention towards examining the scope of directors' obligations and the regulatory structures that shape their behaviours. This is exemplified by the research conducted by Redmond (2012), McBarnet et al. (2007), and Gill (2008).

From an economic standpoint, the sustainability of a company can be determined by its ability to consistently create value for its shareholders and other pertinent stakeholders. The aforementioned procedure involves fostering innovation as a tactic to augment competitiveness and resilience, while concurrently efficiently allocating resources. Businesses can enhance their long-term sustainability and contribute to overall economic prosperity by implementing strategies that focus on profit maximisation and growth (Epstein et al., 2014; Rezaee, 2018; Brockett and Rezaee, 2012).

The social dimension of corporate sustainability underscores the significance of ethical and responsible business practices. The primary aim is to promote the principles of egalitarianism and fair treatment of employees throughout the organisation and its entire network of suppliers (Mani et al., 2015). The concept of corporate sustainability

encompasses not only the internal welfare of a company but also extends to the well- being of the communities in which it operates. The phenomenon under consideration encompasses various essential elements, including the examination of social issues, the

advancement of community development, and the attainment of favourable societal outcomes (Mani et al., 2015).

The stewardship of the environment is widely regarded as the third essential element of environmentally responsible business practices. Brusseau (2019) and Ones and Dilchert (2012) posit that sustainable enterprises actively strive to mitigate the adverse impacts of their activities on the immediate environment, preserve limited resources, and impede or potentially reverse the pace of environmental deterioration. This may encompass actions such as transitioning to energy-efficient appliances, intensifying recycling efforts, and implementing policies aimed at mitigating the advancement of global warming. (Brusseau, 2019; Ones and Dilchert, 2012) Numerous studies have demonstrated that the incorporation of environmentally sustainable business practices by corporations plays a substantial role in safeguarding global ecosystems in the long run.

The concept of sustainable business practices is undergoing constant evolution due to a multitude of factors, including the adaptation of societal norms, the limitations imposed by the natural environment, and the dynamics of the economic landscape. To achieve success, an individual must possess a mindset that is distinguished by a persistent inclination towards personal development, flexibility in response to changing circumstances, and openness to innovative ideas. Only through this process can individuals aspire to attain their objectives and actualize their full capabilities.

2.3 Impact of Corporate Sustainability on Organisations

According to Simionescu and Dumitrescu (2018), there is evidence that can be found in the real world to suggest that when businesses implement sustainable business practices, they see improvements in their company's performance. According to Herrera and de las Heras-Rosas (2020), the impact that CS has on a company's financial performance, its reputation in the market, and the overall welfare of its employees highlights the significance of CS. According to Wilshusen and MacDonald (2017), establishing a connection between efforts and outcomes is a crucial undertaking because it has the potential to yield significant positive impacts on society. This is one of the many claims made in the aforementioned research article.

According to Baumgartner (2014), the realisation of the full competitive potential of corporate sustainability is dependent on the accurate identification of the various opportunities associated with sustainable development. This is of the utmost importance. According to Ashraf et al. (2019), organisations are increasingly compelled to integrate corporate sustainability into their strategic frameworks to achieve sustained success in the face of growing demands from stakeholders.

Corporate social activities, as stated by Paraschiv et al. (2012), make it easier to promote eco-innovation, responsible leadership, and the establishment of a sustainable corporate culture. Additionally, these activities help to establish a more sustainable corporate culture.

In addition, the significance of certifications such as ISO 14001 in expediting a company's dedication to sustainability concerns is emphasised (Maletic et al., 2015; Ramos et al., 2013). These studies highlight the importance of certifications in this regard. There has been a recent uptick in the number of partnerships formed between business entities and environmental non-governmental

organisations (NGOs). (Daddi et al., 2019; Joensuu et al., 2015) Partnerships of this nature result in enhancement, credibility, and significance for all parties involved.

The implementation of environmentally responsible practices has consequences that are felt not only in the realm of effects on the natural environment but also in the economic sphere. The benefits encompassed in this context consist of enhancements in economic performance resulting from improved environmental and social governance (Budsaratragoon & Jitmaneeroj, 2019), the creation of value through capitalising on opportunities and mitigating risks (Kocmanova et al., 2017), enhanced investor relations (Garcia-Sanchez et al., 2019; Serafeim, 2020), and the cultivation of a more favourable public perception (Schrobback & Meath, 2020).

The Chinese government shows that it is aware of the significance of this knowledge through its efforts to guide the advancement of sustainability through initiatives led by the state, the establishment of conceptual frameworks, and legislative progress (Liu & Yan, 2018). According to Weber (2017), the adoption of green credit policies in China has been a significant factor in the improvement of the banking industry's level of competitiveness.

2.4 The roles of Leadership in integrating CS into Strategic Management

Several studies (Brown and Mitchell, 2010; Fehr et al., 2015; Blome et al., 2017) have presented empirical findings that suggest a strong influence of managerial attributes and leadership styles on the strategic decision-making process within organisations. Based on the research conducted by Kumar and Paraskevas (2018), it has been observed that leaders exhibit the ability to comprehend and grasp the strategic landscape in which their organisations operate.

In the field of leadership studies, there has been a discernible surge in scholarly inquiries in recent years, specifically examining the distinctive attributes of transformational and transactional leaders. Previous scholarly research has indicated that transformational leaders possess the ability to exert influence over their followers through a range of strategies, including the utilisation of their charismatic qualities, offering clear guidance on the significance of their work, and attending to their followers' higher-level needs (Vera and Crossan, 2004; Du et al., 2013).

Bass et al. (2003) and Du et al. (2013) have posited that transactional leaders exhibit distinct characteristics, including a focus on resource exchange, maintenance of the status quo, and the resolution of constraints and efficiency-related matters. To ensure the stability of an organisation, it is crucial to address and rectify employee behaviour. One strategy for attaining this goal entails the adoption of standardised protocols and the formulation of measurable targets (Bass, 1985, Judge & Piccolo, 2004). The concept of transactional leadership, as originally proposed by Bass (1985) and subsequently reinforced by Judge and Piccolo (2004), consists of two fundamental elements: management by exception and contingent reward. According to Ojha et al. (2018), the authors assert that the importance of transformational leadership in projecting a positive organisational image is greater than that of transactional leadership.

On the other hand, ethical leaders are motivated by moral principles and values, and they guide their organisations towards a trajectory that is in line with the notion of corporate sustainability. The correlation between ethical leadership and corporate sustainability is apparent, as substantiated by empirical evidence presented by the stakeholder theory. The stakeholder theory, as posited by Phillips et al. (2003), explores the ethical and moral dimensions of managerial practices through the lens of

various groups associated with an organisation, considering their interests and concerns. The utilisation of stakeholder theory in leadership demonstrates its benefits, as it recognises the presence of various entities within an organisation, each with a legitimate strategic and ethical interest in the organization's success.

According to (Brown et al., 2005), ethical leadership entails consistent adherence to universally recognised standards and values. Leaders actively promote and motivate their followers to embrace and adhere to ethical principles through the implementation of effective communication strategies, consistent reinforcement, and sound decision- making (p. 120). Ethical behaviour is attributed to individuals in positions of authority when their actions are consistent with established standards of moral conduct. Piccolo et al. (2010), argue that leaders foster a sense of accountability within their subordinates by taking personal responsibility for their actions and implementing appropriate systems of rewards and punishments. The importance of ethics in everyday life is underscored, and individuals exhibit ethical conduct as a means of establishing a constructive model. Leaders who demonstrate high ethical standards have a responsibility to thoroughly consider relevant circumstances to the greatest extent possible for the benefit of the public.

2.5 Transparency as a driver in Corporate Sustainability

Transparency, characterised by the adherence to principles of truthfulness and openness, constitutes an essential element of ethical corporate behaviour. To ensure its long-term viability, a business must prioritise the establishment and nurturing of trust and credibility

among a diverse range of stakeholders, such as investors, consumers, employees, communities, and regulators (Turyakira, 2018; Chandler, 2016; Biggemann et al., 2014). The exhibition of environmental, social, and

governance practises in a transparent manner provides substantiation of corporations' dedication to ethical and responsible decision-making. The concept of transparency is of utmost importance in fostering meaningful involvement with stakeholders and strengthening connections with constituents (Clementino & Perkins, 2021). Organisations can successfully engage stakeholders by implementing a transparent approach in their communication of sustainability goals, initiatives, and progress. The role of transparency is of utmost importance in facilitating stakeholders' ability to effectively monitor an organization's progress towards sustainability goals, thereby augmenting the level of accountability (Clementino & Perkins, 2021). The evaluation of a company's assertions can be conducted by stakeholders through the examination of its key performance indicators, environmental impacts, and social initiatives (Ferrell et al., 2021). The introduction of this accountability mechanism aims to address the issue of "greenwashing" and promote sustainability efforts by establishing corporate responsibility.

The importance of transparency in the context of global multilateral environmental agreements for the attainment of sustainability is widely recognised. The emergence of the digital economy has greatly raised individuals' awareness of their rights and has resulted in a greater need for transparency in information dissemination (Tapscott and Ticoll, 2003). The trend mentioned above highlights the growing importance of transparency in attaining success in the field of business (Kassoy, 2010). Contemporary enterprises employ diverse communication channels, including annual reports, social media platforms, and websites, to augment transparency and meet societal expectations. Historically, the primary emphasis of correspondence has revolved around the distribution of financial, operational, and corporate governance reports. The adoption of sustainability reporting, specifically within the realm of publicly

traded companies, has witnessed a significant increase in prominence and has transformed into a compulsory requirement for disclosure (Tapscott and Ticoll, 2003).

Williams (2005) posits a correlation between transparency and various factors, including relevance, time, and readability. Bushman et al. (2004) propose that the assessment of transparency can be undertaken by considering various elements, including the calibre of corporate reporting, the revelation of private assets, and the dissemination of information. Dubbink et al. (2008) argue that the assessment of transparency in sustainability reporting requires the examination of efficiency, freedom, and virtue.

Transparency is widely valued within the realm of sustainable practises, as it has the capacity to illuminate both the practises themselves and their corresponding impacts (Bodansky, 2016). The assessment of a corporation's sustainability report requires the application of measurable indicators of transparency.

2.6 Case Study 1

The oil and gas industry has been over time accused of not being transparent in their sustainability dealings and reporting. In an article published by Guardian Newspaper in August 2022, it was revealed that the oil and gas industry spent over £800,000 on social media influencing following the Labour proposed windfall tax. In the case of BP oil and gas, BP presented itself as a provider of environmentally sustainable solutions that are beneficial for the United Kingdom. However, the magnitude of their investments in fossil fuels far surpasses the financial resources allocated to green initiatives. BP exhibited a notable level of ambition in its energy transition plans compared to other key players in the oil and gas industry. However, an analysis conducted by Oil Change International in May 2022 revealed that the strategies

implemented by the sector are insufficient to effectively limit global warming to 1.5°C over pre-industrial levels, as stipulated in the Paris Agreement, owing to the fact that the ads were misleading, and the company is practising “greenwashing” (Lewton, 2022).

Similarly, Shell PLC also ran ads during this time via Meta, a parent company of Facebook and Instagram. As part of this arrangement, Shell had paid Meta to disseminate numerous influential advertisements throughout the year, resulting in their exposure to over a million viewers in the United Kingdom. The advertisements showcased Shell's renewable energy and electric car charging stations efforts. However, the firm did not categorise these commercials as about "social issues, elections, and politics." Consequently, the ads were displayed without a notice indicating the entity responsible for their funding. The Shell advertisements under investigation were ultimately removed by Meta due to a violation of company policy. However, the inquiry revealed the existence of numerous other comparable advertisements that had been running without a disclaimer for over a month, thus evading detection by Meta's moderation procedure. This shows that the companies do not ultimately report correctly what is being practiced which is called greenwashing.

Okeke (2021) conducted a content analysis examining one hundred and fifty annual reports from fifteen oil and gas companies operating in Europe, Asia, and America. The purpose of this analysis was to investigate the extent to which these companies align their practises with sustainability, to assess the level of support they provide for their environmentally friendly claims. It was reported that the findings suggest that there is a noticeable discrepancy in the level of emphasis on supply chain sustainability within the global oil and gas industry. Specifically, oil and gas companies
in Asia and America are found to be falling behind in this regard. These companies

have a significant amount of work to undertake to fully prioritise and address the three dimensions of sustainability. The current focus exhibited by major oil corporations is

unlikely to lead to a future oil and gas business that is more sustainable. Consequently, it is anticipated that these companies will need to adopt more sustainable practices, considering the inherent characteristics of their operations and the limitations imposed by the industry (Okeke, 2021).

In their recent study, Kwarto et al. (2022) conducted a comprehensive investigation into the potential biases in sustainability reporting within the global upstream oil and gas sector. The findings revealed that a majority of companies have yet to adopt the triple-bottom-line approach and that sustainability reporting in this industry frequently includes information that does not adhere to relevant standards.

Thus, this study will explore the level of transparency in sustainability reporting across different industries in relation to the independent checks by regulatory bodies and a focus on the industries within the United Kingdom.

2.7 Case Study 2

Throughout history, there have been several instances of corporate scandals that have garnered significant attention. Examples include the James Hardie (Peacock, 2018), Enron (Constable, 2021), and Anvil Mining (Reuters, 2011) scandals. These incidents have been further exacerbated by the acknowledged involvement of corporations in significant environmental catastrophes. One notable case is the Deepwater Horizon oil rig spill in 2010, where BP was implicated (Friedman, 2020). This incident resulted in the loss of human lives and the imposition of substantial financial penalties against BP, reflecting the extensive negative consequences on both human well-being and the natural environment. These cases have brought attention to the degree to which

influential business entities possess the ability to establish their regulations and guidelines for conduct, without considering the potential repercussions for others. Consequently, there has been a surge in public demand for enhanced corporate accountability. According to Benn et al. (2014, 3–23), in meeting the challenge posed by corporate sustainability, organisations need to redesign the way they do business.

The significance of addressing environmental, social, and governance (ESG) concerns is progressively gaining importance for organisations operating in many industries. According to a recent survey carried out by McKinsey, 83% of C-suite executives and investment professionals hold the belief that Environmental, Social, and Governance (ESG) programmes would provide greater shareholder value in the future, specifically within a five-year timeframe, compared to their current impact (McKinsey, 2020). As stated by Ellyn Shook, the Chief Leadership and Human Resource Officer of Accenture, Organisations possess the potential and responsibility to foster growth while concurrently promoting favourable social and environmental consequences. The initial step is the redefinition of the concept of responsible leadership. The current cohort of individuals is

assuming a prominent role in spearheading progress, prioritising the creation of worthwhile upholding ethical principles. According to Accenture's study on responsible leadership, organisations that received high ratings for their environmental, social, and governance (ESG) performance demonstrated average operating profits that were 3.7 times greater than those of companies with lower ESG ratings. Shareholders were shown to have gotten much greater yearly total returns, surpassing the returns of companies with lower environmental, social, and governance (ESG) performance by a factor of 2.6 (Shook, 2020). It can be argued that the major reason that organisations engage in corporate sustainability and corporate social responsibility is because of the economic gains that

come with the practice. Coelho et al. (2023) conducted a study which posits that corporate social responsibility (CSR) has a direct influence on a company's financial performance. Furthermore, the study indicates that this influence grows increasingly substantial as the company's environmental, social, and governance (ESG) ratings demonstrate improvement.

The concept of sustainability is predicated upon the combination of three distinct communities that have traditionally operated independently: individuals and groups primarily concerned with economic gains (profit), environmental preservation (planet), and social well-being (people). How can corporate executives effectively navigate and balance the various demands and responsibilities associated with their roles? Should the proposed approach involve treating these entities as distinct communities forming a nascent coalition? There exists a prevailing inclination to perceive the three communities as inherently contradictory, characterised by divergent interests that compete with one another.

The triple bottom line method encompasses the three fundamental foundations of sustainability. Each of the three can be linked to a distinct community of interests, which are represented by a range of organisations including governmental bodies and non-profit companies. How can an organisation effectively manage and address the diverse demands of multiple communities? Is the act of achieving balance the appropriate method to employ?

This study will explore the role of leadership in the implementation of corporate sustainability in strategic management.

3.0 Methodology

This study will employ the use of two main research methods to address the question of the extent to which large corporations are transparent in their sustainability performance and the role that leadership plays in implementing it.

One of the research methods used in this study is a systematic literature review (SLR). The main objective of this study is to collect and analyse all pertinent academic sources in order

to offer a comprehensive analysis of the research topic on leadership, transparency, and corporate sustainability. This analysis aims to increase the significance of the subject matter (Meredith, 1993) and make valuable contributions to the existing body of research (Easterby-Smith et al., 2002). The problem was conceptualised, scrutinised, and submitted to rigorous analysis in order to identify important terms. The scientific publications containing research contributions were imported into the Rayyan platform for the purpose of conducting quality assessments. The titles and abstracts of the materials were thoroughly scrutinised to determine their appropriateness for inclusion in this research. The research query and primary purpose of this study were addressed by a thorough assessment of the selected papers, together with supplementary documents, in order to collect pertinent information.

The systematic review methodology was selected due to its ability to offer a thorough and organised examination of the intricate relationship between leadership, transparency, and business sustainability. This approach is well-suited for the synthesis of diverse research studies, conceptual frameworks, empirical evidence, and case studies, which collectively contribute to a comprehensive understanding of the research problem.

According to Agi et al. (2020), the Systematic Literature Review (SLR) process begins by defining the scope of the research. Following this, the aim of the review is established (Agi et al., 2020; Tranfeld et al., 2003), and a delineated approach is formulated for conducting the data search, which is subsequently followed by the acquisition of relevant research materials (Agi et al., 2020; De Oliveira et al., 2018; Tranfeld et al., 2003).

This systematic literature review (SLR) followed the steps outlined in Figure 1 as a structured research protocol. The first step of this study involved clearly defining the scope and objective of the research, as outlined in the introduction section. The subsequent phase involved the selection of a database for the research.

The third stage involved the retrieval of published articles.

The fourth step entailed the retrieval of all scholarly articles that satisfied the established research criteria. During the fifth and sixth stages of the study, a thorough examination was conducted of the titles and abstracts of the relevant papers, leading to the categorization of materials and the subsequent exclusion of papers that were not pertinent to the topic under investigation. The subsequent phase, the seventh stage involved the systematic arrangement of pertinent resources for the systematic literature review (SLR) pertaining to the topic. During the eighth and final stage, a comprehensive review would be conducted on the eligible materials, which yielded valuable insights into the research topic (Agi et al., 2020; De Oliveira et al., 2018; Tranfeld et al., 2003).

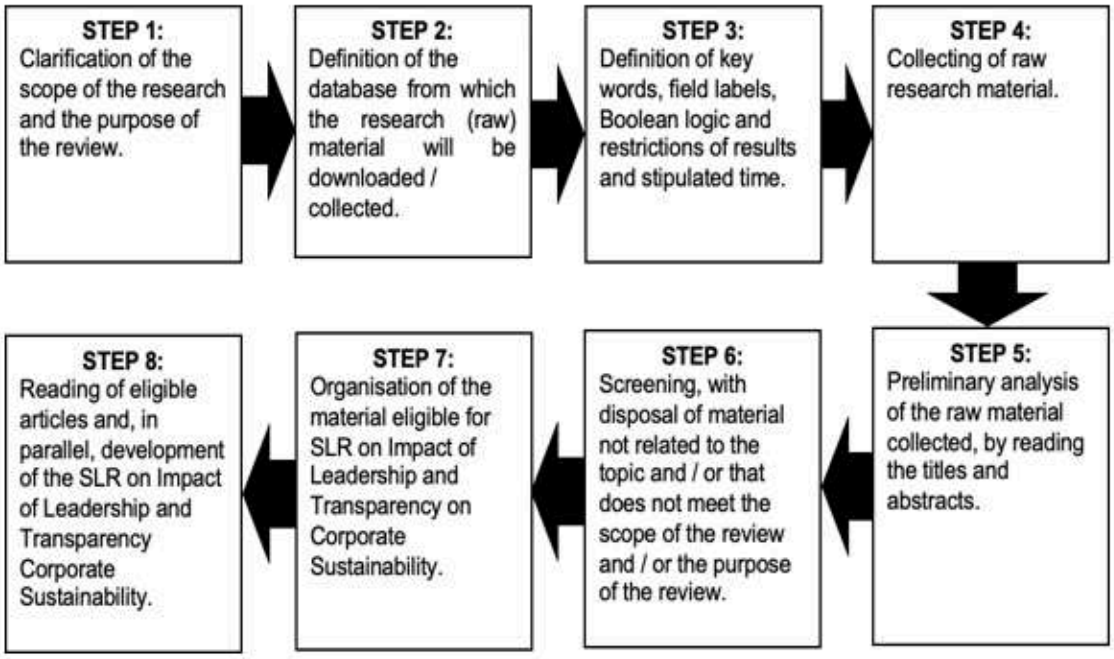

Figure 3. 1: Structured Research Protocol for the SLR

Secondary Data Collection

The second research method used in this research is the collection of secondary data from the ESG reporting website (MSCI) to confirm and ascertain the level of reporting done by various companies in diverse industries across the globe. MSCI is a leading provider of essential decision support tools and services catering to the worldwide investing community. The primary objective of MSCI ESG Ratings is to assess a company's ability to effectively manage financially significant environmental, social, and governance (ESG) risks and opportunities. They employ a rules-based approach to ascertain the status of industry leaders and laggards based on their level of exposure to environmental, social, and governance (ESG) hazards, as well as their proficiency in managing these risks in comparison to their counterparts.

Companies were identified based on the top 500 global companies and a selection of

20 companies was made. These companies are industry leaders in each of the

industries that they operate in. The selection criteria were based on the industries that were most famous for being poor at sustainability performance like the oil and gas, and mining industry.

3.1 Keywords Development

The keywords chosen for this research are corporate sustainability, leadership, transparency, corporate unsustainability, sustainability reporting, and triple bottom line. The databases, such as, 'Journal of Business Ethics', 'Scopus', 'And Google Scholar' were searched. The Boolean search approach was utilised to conduct searches, utilising operators such as 'AND' and 'OR' to combine terms and effectively define, organise, and filter through the databases in order to obtain pertinent results.

3.2 Identification and Database Sources

This section explores the complete data collection method implemented to get pertinent and reliable information for the systematic review of the interrelationship between leadership, transparency, and business sustainability. The utilisation of a wide range of sources ensures a comprehensive and nuanced examination of the research subject matter.

3.2.1 Academic Databases and Journals

Academic databases serve as a primary source for accessing peer-reviewed research articles, conference papers, and academic publications related to leadership, transparency, and corporate sustainability. Databases such as the Journal of Business Ethics, Scopus, and Google Scholar were selected and searched for relevant information using carefully selected keywords and search strings to align with the study objectives. The incorporation of academic databases guarantees the availability

of a diverse array of scholarly viewpoints and empirical research, hence enhancing the depth and scope of the systematic review.

3.2.2 Reputable Reports and Publications

Reputable research and publications published by recognised organisations think tanks, and industry groups offer beneficial insights into the actual implementation of leadership and transparency in the context of corporate sustainability. The websites of the Organisation for Economic Co-operation and Development (OECD), KPMG and Global Reporting Initiative (GRI) Sustainability Reporting Guidelines and MCSI and Corporate register were reviewed to offer insights into industry best practices, case studies, and trends related to sustainability leadership and transparent practices. This exercise was conducted in July 2023.

3.3 Criteria for Inclusion and Exclusion

The inclusion and exclusion criteria play a crucial role in the systematic review process by providing necessary parameters for the selection of studies that are in line with the research objectives. These criteria are vital in ensuring the credibility and relevance of the synthesised evidence. This section establishes the precise criteria utilised to ascertain the inclusion of studies within the systematic review.

3.3.1 Relevance to Research Objectives

The major determinant for incorporation into the systematic review is the pertinence of the study to the research objectives. Research should focus on investigating the intricate relationship between leadership, transparency, and business sustainability within the framework of sustainable strategic management. The research inquiries and

aims provided a structured framework for evaluating the congruence between each study and the overarching research objectives.

3.3.2 Publication Type and Source

The major sources of inclusion were peer-reviewed academic publications, trustworthy reports from established organisations, and scholarly conference proceedings. It is anticipated that these sources adhere to rigorous standards of research quality, validity, and reliability. Publications emanating from reputable academic and industry sources are more inclined to provide valuable insights for a systematic review.

3.3.3 Currency and Timelines

The timeline used for the research was limited to studies done between 2010 and 2023 because recent research papers have a higher probability of covering the most current advancements, patterns, and viewpoints within the fields of leadership, transparency, and business sustainability.

3.3.4 Language and Accessibility

Studies written in English only were used due to language accessibility.

Inclusion	Exclusion
I. The scope of the search was restricted to scholarly investigations conducted between 2010 to 2023, with the aim of identifying the most recent advancements in scientific understanding.	I. Studies that were published prior to 2010 were not taken into consideration.

II. The research investigation centred on the significance of leadership within the field of CS	II. Research articles that are not written in the English language
III. The study centred on transparency in CS. III. The study centred on sustainability reporting. III. Study written in English only.	III. Non-peer-reviewed articles

Table 3.1: Shows inclusion and exclusion criteria.

The research selected for the review was those that met the specified inclusion and exclusion criteria.

3.4 Ethical Considerations

Ethical considerations hold significant importance in the execution of research, particularly within the framework of a systematic review that encompasses the synthesis and examination of pre-existing research.

3.4.1 Proper Citation and Attributions

This review followed stringent citation protocols, ensuring proper attribution of the original authors and sources for their contributions. The act of plagiarism was rigorously prevented, and all materials utilised in the analysis were duly referenced to acknowledge the original authors.

3.4.2 Transparent Reporting

The systematic review was conducted in a manner that prioritised transparency in reporting by thoroughly documenting key aspects such as the research design, methods of data

collecting, processes for analysis, and the approach used for assessing the quality of the included studies. The systematic review also addressed

and deliberated over limitations and potential biases, offering readers a thorough comprehension of the research methodology.

3.5 Literature Screening

Following the extraction of records, they were subsequently imported into the Rayyan system for screening and selecting eligible studies based on the pre-established eligibility criteria. The process of screening and selection happened between the 25th of July 2023 and the 18th of August 2023. The screening technique involved the implementation of the following workflow:

I. The independent identification and removal of duplicate entries from the database, as detected by Rayyan's software.
II. After evaluating the titles and abstracts, articles that did not match the specified inclusion criteria were deemed ineligible for consideration.
III. The complete texts of all pertinent articles were thoroughly examined to identify any relevant reports.

IV. The reports pertaining to the pertinent study were integrated.

V. The evaluation of the complete papers was conducted according to the pre-established criteria for inclusion.
VI. The analysis of the results was conducted following the parameters outlined in the study's scope.

4.0 Results

4.1 Numbers of extracted papers

The search on the database, registers and websites gave about one thousand seven hundred and papers. Figure 4.1 shows the graph of the distribution of papers extracted from 2010 to

2023 before going through the inclusion and exclusion criteria. Fig 4.2 shows the number of documents by country or territory. Over 30% of the documents reviewed were documents from the United Kingdom with a few documents from other parts of the world to allow us to have an overview of the happenings in other parts of the world. Fig 4.3 represents the type of documents used in the review. A total of approximately 67% of articles were used and a few conference papers, websites, books, and registers.

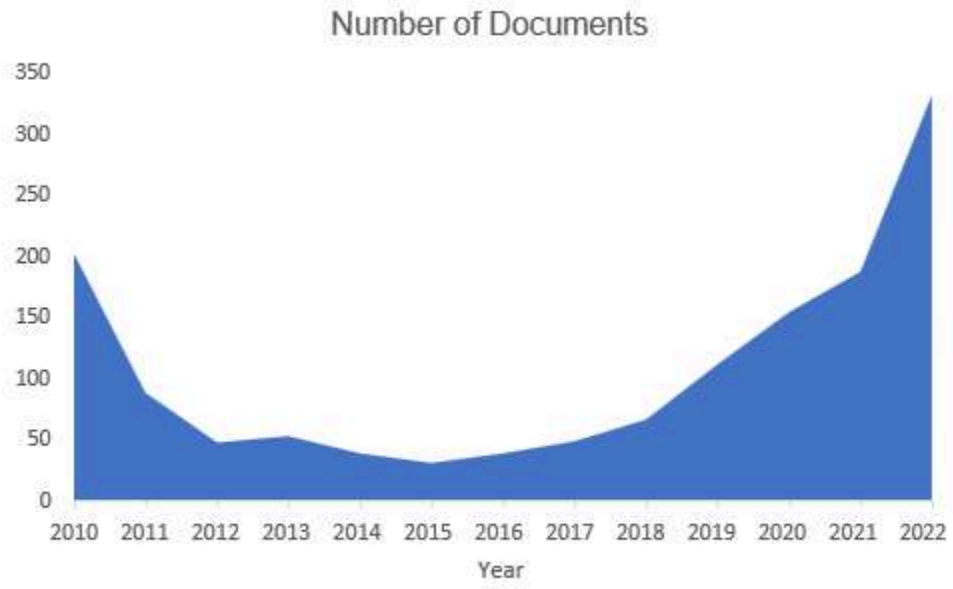

Figure 4. 2: Numbers of documents extracted.

Country	Sum of No of documents	Sum of %
United Kingdom	610	35%

United States	362	21%
Italy	170	10%
China	142	8%
India	102	6%
Spain	87	5%
France	83	5%
Germany	59	3%
Pakistan	52	3%
Malaysia	29	2%
Australia	19	1%
Jordan	17	1%
Grand Total	**1732**	**100%**

Table 4. 3: Country Distribution by extracted papers.

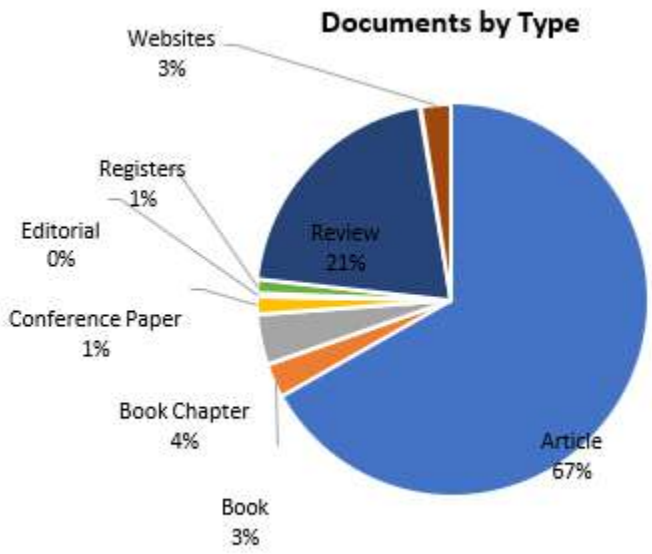

Figure 4. 4: Distribution of Documents by Types

4.2 Extraction process

Figure 4.5 is a Prisma flow diagram of how the total documents extracted from the databases and registers went through the methodology process to get the papers included in this study.

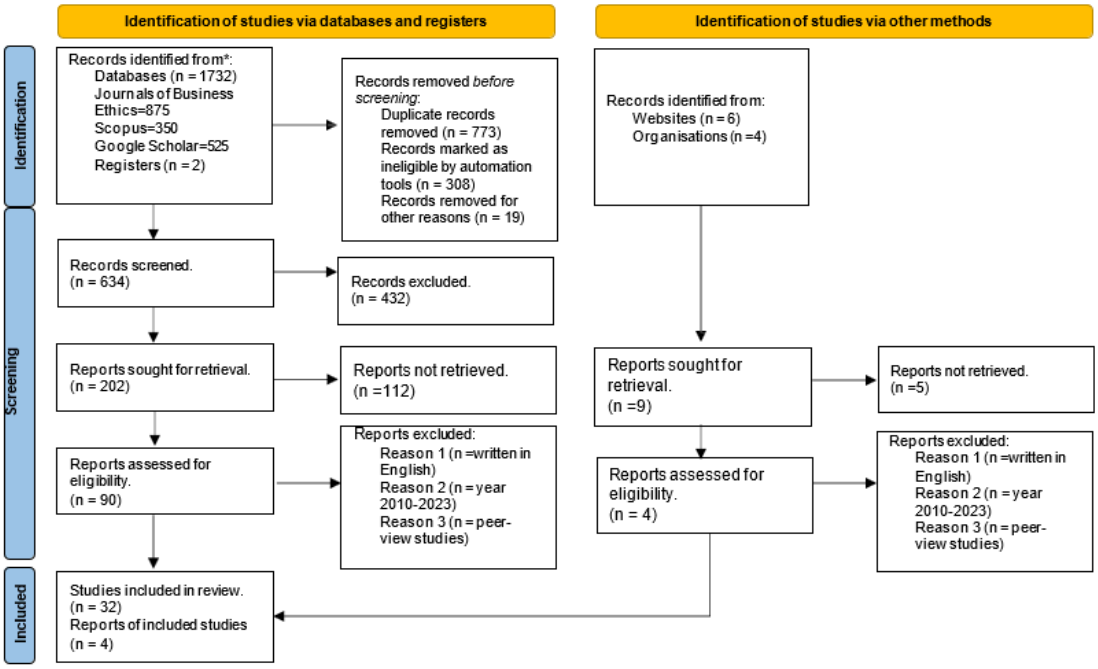

Figure 4.5: Prisma Flow Diagram

4.3 ESG Reporting

Figure 4.4 to Figure 4.9 shows the sustainability reports that were published in the UK from the year 2016 to 2020. Fig 4.4 shows the sum of sustainability reports published in the UK from 2016 to 2020 and the sum of independent assurance statements that were published for that year in review. Figure 4.5 to 4.9 shows the sustainability reports published in the United Kingdom for the following industries.

1. Oil and gas
2. Banking
3. Fixed Line Telecommunications
4. Mining
5. Alternate Energy
6. Food producers
7. General Retail
8. Hardware Technology
9. Software Technology
10. Beverage
11. Chemical
12. Mobile Telecommunications

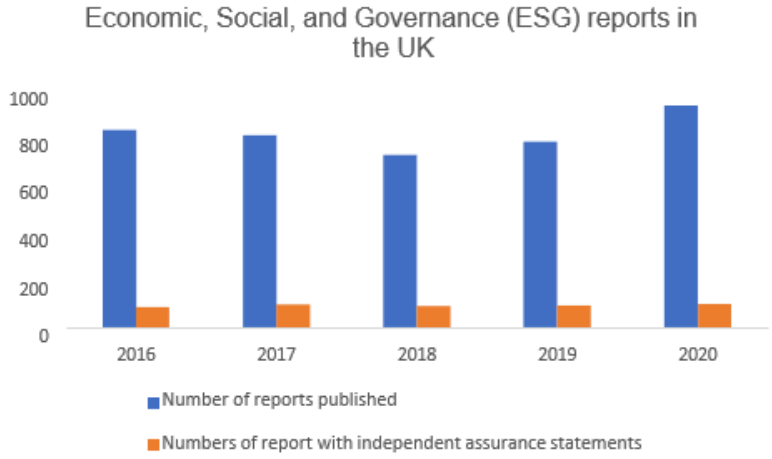

Figure 4. 6: Sustainability reports published in the UK from 2016 to 2020

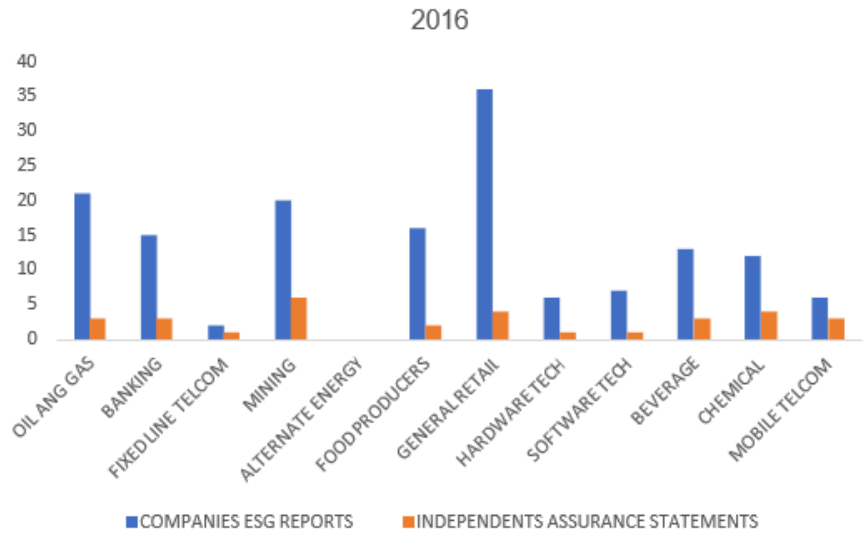

Figure 4. 7: Sustainability reporting in the industries for the year 2016

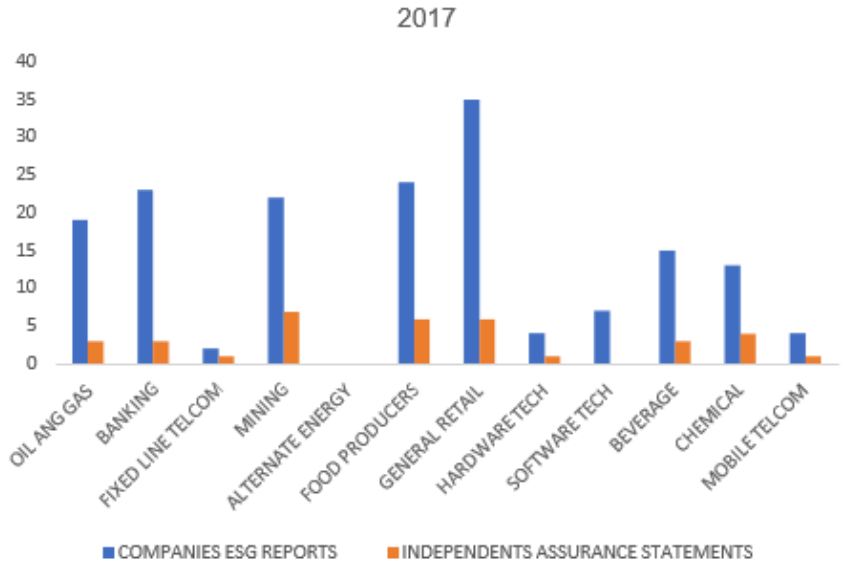

Figure 4. 8: Sustainability reporting in the industries for the year 2017

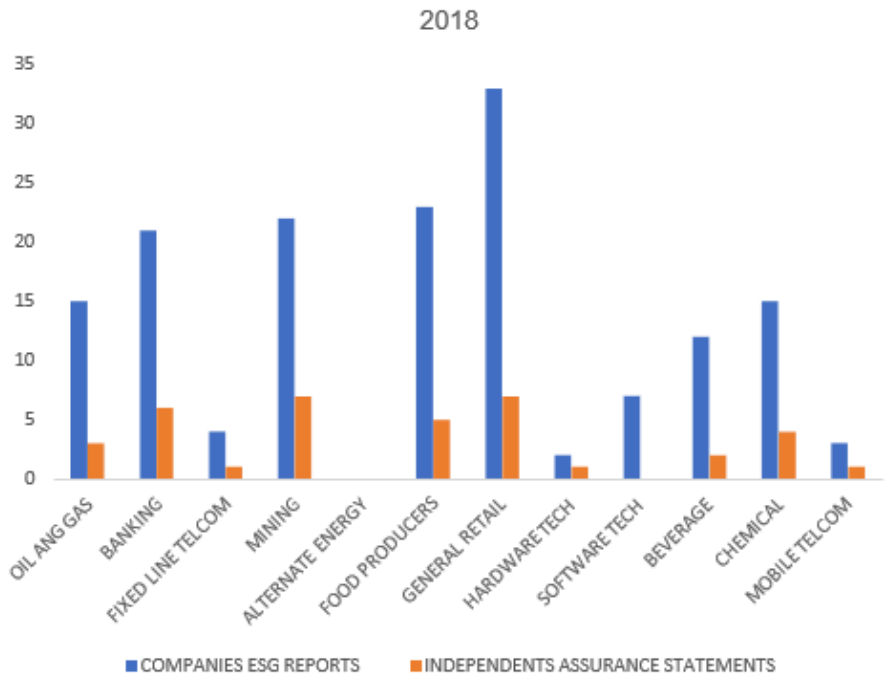

Figure 4. 9: Sustainability reporting in the industries for the year 2018

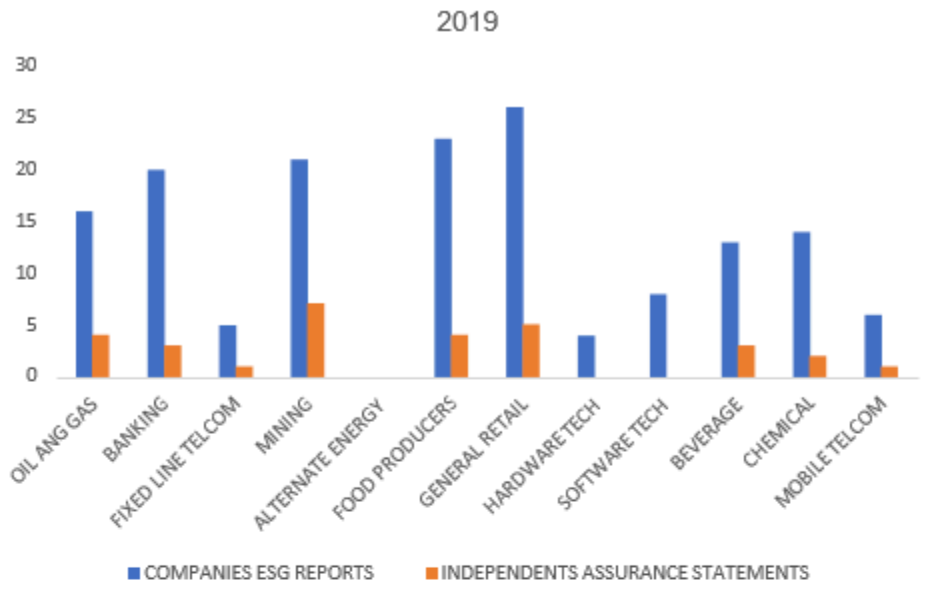

Figure 4. 10: Sustainability reporting in the industries for the year 2019

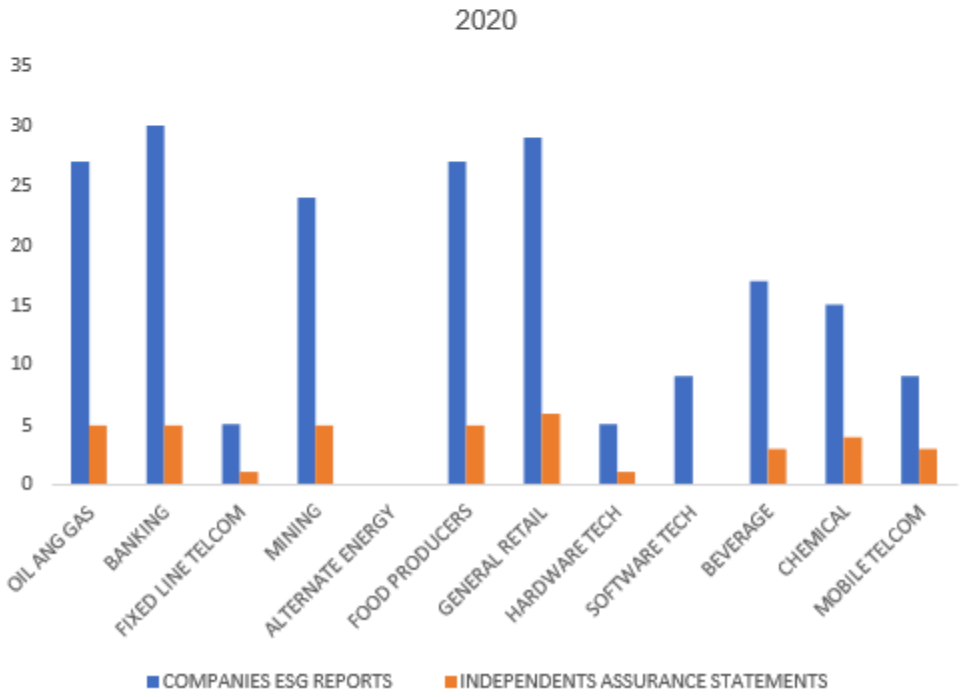

Figure 4. 11: Sustainability reporting in the industries for the year 2020

Table 4.2: Corporations with Implementation of Corporate Sustainability in Strategic Management (MCSI)

Corporations	Country	Decarbonization Target	Target Year	Emissions goals to keep global warming to 1.5°C	ESG Ratings	Environment	Social	Governance	Is the company aligned with any UN sustainable development goals?
Tesco	UK	Yes	2050	1.5°C	AA				• No poverty
Sainsbury	UK	Yes	2050	1.4°C	AAA				• Clean water and sanitation.
Shell PLC	UK	Yes	2050	2.1°C	AA				• Gender equality
HSBC Holdings	UK	Yes	2050	1.3°C	AA				• Gender equality • Affordable and clean energy • Climate action
Unilever	UK	Yes	2040	1.4°C	AAA				• Good health and wellbeing • Clean water and sanitation
Samsung Electronics Co Ltd	South Korea	Yes	2050	2.1°C	A				Unaligned
BP PLC	UK	Yes	2050	3.4°C	A				• Gender equality • Reduced inequalities • Partnership for the goals
Barclays	UK	Yes	2050	1.3°C	AA				• Gender equality • Affordable and clean energy • Climate action
BlackRock Inc	USA	Yes	2040	1.5°C	A				• Affordable and clean energy • Climate action
British American Tobacco	UK	Yes	2050	1.5°C	A				• Gender equality • Clean water and sanitation • Affordable and clean energy • Climate action

Burberry	UK	Yes	2040	1.5°C	AAA				• Gender equality • Decent work and economic growth • Reduced inequality • Climate action
Santander Bank	Poland	Yes	2050	1.9°C	AA				• No poverty • Affordable and clean energy • Decent work and Economic growth • Industry, Innovation, and Infrastructure • Reduced Inequalities
H & M	Sweden	Yes	2050	1.4°C	AA				Unaligned
Apple Inc	USA	Yes	2030	1.3°C	BBB				• Climate aligned
Nestle S.A.	Switzerland	Yes	2050	1.8°C	AA				Unaligned
Domino's Pizza Inc	USA	Yes	2050	1.6°C	BBB				• Gender equality • Decent work and Economic growth
RIO Tinto PLC	UK	Yes	2050	3.2°C	A				Unaligned
Anglo American PLC	UK	Yes	2040	3.2°C	AA				• Gender equality • Reduced inequalities • Partnerships for the goals
Vodafone Group	UK	Yes	2050	1.3°C	A				• Gender equality • Reduced inequalities • Responsible consumptions and production • Climate action
Siemens Energy	Germany	No	-	3.2°C	A				• Gender equality • Decent work and economic growth

The above table 4.2 represents the relationship that exists between corporate sustainability and strategic management, this table shows how some large corporations have measured the results of implementing corporate sustainability to strategic management.

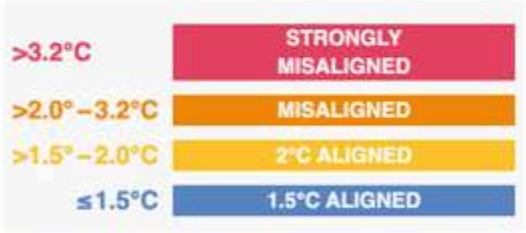

Figure 4.12: Emission goals for Global Warming

CCC	B	BB	BBB	A	AA	AAA
Laggard		Average			Leader	

Figure 4.13: Economic, Social, and Governance (ESG) Rating

Performance Flag

Red: Indicates that a company is involved in one or more very severe controversies.

Orange: Indicates that a company has been involved in one or more recent severe structural controversies that are ongoing.

Yellow: Indicates that the company is involved in severe-to-moderate-level controversies.

Green: Indicates that the company is not involved in any major controversies. However, this could indicate that the company is involved in minor or moderate

controversies.

5.0 Discussion

5.1 How Transparent Are Large Corporations?

Gavana et al. (2017) identified a noteworthy correlation between the size of a company, as measured by the number of employees, and its level of Corporate Sustainability (CS) disclosure. The findings of this study provide support that larger firms experience increased pressure to disclose a greater amount of information to enhance their credibility. There is a substantial relationship between the amount of data that is readily available and the Environmental, Social, and Governance (ESG) scores achieved by different businesses in the market today (Drempetic et al.,2019). Hughey and Sulkoski (2012) contend that an increased level of disclosure results in an improved corporate social reputation, despite the fact that the quality or substance of the information that is disclosed does not affect this conclusion. The correlation between the availability of data and the ESG score can be interpreted to suggest that the act of reporting itself is of primary importance, rather than the specific content of the report itself. Several academic investigations (Dawkins and Fraas, 2011; Drempetic et al.,2019; Qian and Schaltegger, 2017), among others, have yielded evidence supporting a positive association between environmental performance and the practice of environmental disclosure. The idea of transparency is typically regarded as a method that can be utilised to accomplish increased sustainability. On the other hand, several researchers, including Gold and Heikkurinen (2017), have argued that this presumption does not always hold true in a variety of different scenarios. The current situation reveals that there is a dearth of communal discourse regarding the extent to which significance should be accorded to transparency when evaluating the performance of a company with regard to sustainability (Drempetic et al. 2019).

Drempetic et al. (2019) argue that ESG scores are not an accurate indicator of corporate sustainability. While investors are demanding disclosure of corporate sustainability practices before they put money into large companies, ESG integration is not enough. therefore, there is a need for exclusion criteria and output variables like GHG intensity. The first of the three main goals, as described in the report, is to "reorient capital flows towards sustainable investment in order to achieve sustainable and inclusive growth." This result is relevant not only for Sustainability investors but also for political decisions.

It is imperative that reports pertaining to a company's sustainability endeavours accurately and comprehensively depict the entirety of said effort. Nevertheless, it is worth noting that these practices are frequently discretionary, thereby rendering them susceptible to diverse interpretations and potentially facilitating the deceptive practice of greenwashing (Hahn and Lülfs, 2013). The Global Reporting Initiative (GRI) has implemented standardised reporting guidelines with the aim of promoting and compelling businesses to disclose their sustainability performance, encompassing both positive and negative aspects (Hahn and Lülfs, 2013).

According to Dubbink et al. (2008), there are a variety of approaches that can be taken to evaluate the degree of transparency present in corporate sustainability. The reliability of the reports is the most important factor to take into consideration. The ratio of times that the organisation has disseminated a sustainability report over the course of the designated evaluation timeframe is one possible metric that can be used to evaluate the reporting frequency of an organisation. Eccles et al. (2012) propose that there is a positive correlation between the frequency of reporting on sustainability and the extent to which stakeholders communicate with one another. The level of implementation is yet another problem that needs to be fixed as soon as possible.

These variables, which are contained within the GRI framework, are used as indicators of the degree to which the sustainability reports that are presented adhere to the G3 guidelines. The Guidelines provide a comprehensive framework for reporting basic content, applicable to organisations of all sizes, sectors, and geographical locations. The aforementioned guidelines serve as the fundamental basis for all subsequent GRI reporting recommendations. The G3 Guidelines delineate a disclosure framework that organisations have the option to accept on a voluntary basis, with flexibility and the ability to implement it gradually. The inherent adaptability of the G3 format enables organisations to strategically chart a trajectory for ongoing enhancement of their sustainability reporting methodologies. There is a positive correlation between high levels of application and increased levels of global activity communication, as stated by Eccles et al. (2012). This heightened level of communication has also been linked to the idea of openness regarding self-regulation. This metric acts as a stand-in for other essential aspects of transparency, such as comprehensiveness, relevance, and accessibility to the public.

The declaration of the level is the third metric in determining the extent a company is transparent about its sustainability reporting. This third variable represents the frequency with which sustainability reports are subjected to third-party comment or assessment by GRI (Global Reporting Initiative 2011). The findings of this investigation lend credence to the reliability and credibility of the reports that have been published. Figures 4.7– 4.12 illustrate the depiction of assurance, which is the fourth metric and most important in determining the level of transparency in sustainability reports. The graphs that have been provided depict the period from 2016 to 2020 and illustrate the quantitative information that is associated with sustainability reports in the United Kingdom. Figure 4.7 is a graphical representation that illustrates

the collective compilation of sustainability reports from a wide variety of industries all over the United Kingdom, covering the period from 2016 to 2020. A total of 4086 reports were published by the industries in the UK, although only 476 of those reports had independent assurance statements published. The graph that is presented illustrates a notable disparity between the number of Sustainability reports and the astonishingly low frequency of independent assurance of such reports. This indicates that only 11.6 per cent of the reports published are deemed credible and reliable as seen in Figure 4.7.
For the purpose of this research, the following sectors were examined in the United Kingdom to determine the extent of transparency in some large corporations. The sectors are mining, banking, general retail, food producers, oil and gas, alternate energy, fixed-line telecommunications, Mobile Telecommunications, Hardware Technology, Software Technology, Beverage, and chemicals. Industries. The level of industry transparency that was observed throughout the entirety of the assessment is depicted in Figures 4.8 to 4.12. While the general retail sector had the highest number of published reports from 2016 to 2019, there were only a few reports that were published with independent assurance statements. This demonstrates the degree to which these companies published credible and reliable reports. The existence of an independent assurance contributes to the credibility of the organisation while also increasing its level of transparency. So, while the other metrics in measuring transparency are useful tools, the independent assurance statement gives the most credibility to published reports.
Because these independent checks are not carried out regularly, and the seemingly complex nature of sustainability, sustainability reporting has been found to be flawed with many companies practising what is called “greenwashing”. The ESG data

provided by companies in their sustainability report is usually unaudited which makes it easy for organisations to practice greenwashing. Greenwashing is described as a firm appearing transparent by disclosing large quantities of ESG data but usually performs poorly in ESG (Yu et al., 2020). Greenwashing refers to a strategic choice made by companies to disclose information in an intentional manner, with the intention of reaping benefits for the company while imposing costs on society (Bowen and Aragon-Correa (2014), Du (2015). According to Yu et al., 2020, a firm’s greenwashing capabilities are affected by several factors.

1. Firm-Level Governance Factors: The existing body of literature indicates that firms may view ESG and CSR disclosure as a strategic measure to meet the growing demand for information from both non-shareholder stakeholders and shareholders (Dhaliwal et al., 2011; Kim et al., 2012; Dhaliwal et al., 2012; Lu et al., 2017). According to the literature, enhanced monitoring and heightened scrutiny by relevant stakeholders have the ability to mitigate knowledge asymmetry among involved parties, hence diminishing the likelihood of business managers engaging in greenwashing practices pertaining to environmental, social, or governance concerns individually.

2. Country Factors: Existing scholarly literature suggests that the phenomenon of greenwashing, as exhibited by firms, is influenced by the extent of scrutiny imposed by their country of origin on their conduct. According to the findings of Marquis and Qian (2014) as well as Marquis et al. (2016), it has been observed that companies exhibit a greater frequency in the publication of their environmental and corporate social responsibility (CSR) reports when their headquarters are located in countries with a higher density of environmental

non-governmental organisation (NGO) members or when they are subjected to monitoring by regulatory agencies.

3. Cross-Listing: The concept of cross-listing pertains to the inclusion of a company's shares on a stock exchange outside of its home country, in addition to its listing on the domestic stock exchange. There is a prevailing belief that the implementation of enhanced transparency regulations is anticipated to possess a higher probability of dissuading cross-listed corporations from partaking in deceptive environmental claims, commonly referred to as greenwashing.

To mitigate the practice of greenwashing, it is suggested that organisations undergo comprehensive scrutiny by independent directors, investors, and significant public figures inside a less susceptible country system, as well as engage in cross-listing. Two governance elements at the firm level could be highly successful in mitigating corporations' deceptive disclosure pertaining to ESG dimensions (Yu et al., 2020).

Japan is widely recognised as a prominent nation in the field of sustainability reporting. In their study, Haider and Nishitani (2020) investigated the perspectives of Japanese business leaders regarding the future of assurance practices pertaining to the certification of published sustainability reports. The researchers employed empirical methodologies in their study, focusing on the analysis of data from the top 500 companies listed on the Tokyo Stock Exchange. The results of the study conducted by Haider and Nishitani (2020) indicate that respondents exhibited a clear hesitancy towards embracing assurance on sustainability reporting. Conversely, third-party comments were found to be more positively received. According to Haider and Nishitani (2020), the main obstacles to the broader acceptance of assurance services include the significant expenses associated with assurance, limited stakeholder

interest in sustainability assurance, and the complex nature of the assurance process.

5.2 Role of Leadership in Implementation of Corporate Sustainability

The beginning of the identification, measurement, and reporting of social, environmental, and economic consequences is contingent upon the commitment of the

CEO and board of directors to the implementation of improved sustainability management practises (Epstein et al., 2014, 43–47). According to Lozano (2013, 2015), leadership has been widely recognised as a crucial internal factor influencing corporate sustainability. Therefore, it is essential to investigate the role of leadership in relation to corporate sustainability and the implementation of sustainable practices to better understand organisational behaviour.

According to Brunner (2006), the effective execution of a business sustainability strategy is significantly impacted by crucial factors such as organisational culture, knowledge, and management attitudes and behaviour. Engert and Baumgartner (2015) noted in their study that the research conducted by Brunner (2006), is predominantly theoretical and quantitative in nature. They further suggested that there is a need for a more pragmatic approach to the implementation of corporate sustainability. Engert and Baumgartner (2015) conducted an empirical analysis of a specific automobile company and discovered that prioritising sustainability and incorporating it into the existing core strategy is crucial. The research findings indicate that effectively addressing the disparity between the development and execution of corporate sustainability strategies relies on six critical factors for achieving success. These factors include the makeup of the organisation, the culture of the organisation, management, management control, staff motivation and expertise, and interpersonal interaction. Additionally, the authors emphasised the importance of aligning strategy,

organisational structure, and organisational processes to achieve optimal coherence and effectiveness. In addition to the considerations, it is imperative to establish a precise delineation of sustainability and its corresponding aspirations to facilitate the incorporation of sustainable practices. This integration is crucial as it enables these practices to function as exemplars for employees to emulate.

In the study conducted by Klettner et al., (2013) on a sample of fifty large, publicly traded companies, it was discovered that one of the challenges encountered by a significant number of the organisations examined is the absence of suitable frameworks to effectively execute, evaluate, and oversee the strategic implementation of sustainability. As a component of the research, an examination was conducted of the companies' disclosures about the implementation of their sustainability strategies. It was noted that certain companies, despite providing extensive information regarding their policies, standards, and management systems employed in the execution of sustainability practices, had encountered multiple significant emissions failures in recent times. The authors posit that there exists a necessity for enhanced assistance aimed at firms concerning the leadership and governance of sustainability endeavours. This is particularly crucial in terms of successfully incorporating sustainability into pre-existing corporate governance frameworks.

5.2.1 Leadership Styles Effectiveness in Implementing Corporate Sustainability

An effective leader is characterised by their ability to exert influence over their subordinates in a positive manner, with the aim of achieving the intended objectives. The various leadership styles exhibit their impact on the efficiency and performance of organisations (Mahdinezhad et al., 2013).

In the research of the leadership style that is most effective for the implementation of corporate sustainability, various researchers have come up with what they deem as the most efficient leadership style. Using a quantitative and cross-sectional research approach, Gull et al., 2022 collected responses from 200 managerial-level employees in Pakistan using questionnaires to test if transformational leadership is instrumental to environmental sustainability. The study's findings suggest that the transformative capabilities of leaders have a significant impact on an organization's ability to adopt environmentally friendly practices. The research findings corroborated the notion that transformational leaders commonly demonstrate responsible leadership, hence resulting in a positive influence on their employees (Pless and Maak, 2021) to achieve the ecological goals of their organisation. The result was also confirmed by research conducted by Malik et al., (2020) that posited that transformational leadership has a more positive correlation in improving a company's sustainability than transactional leadership style.

According to Metcalf and Benn (2012), the relationship between diverse leadership styles and the successful implementation of corporate sustainability is a complex one, mostly due to the intricate nature of sustainability itself. The authors proposed that in order to effectively integrate sustainable practices within an organisation, it is important for leaders to possess the ability to comprehend and anticipate intricate challenges, include many stakeholders in flexible and adaptive organisational transformations, and adeptly handle emotional dynamics. Thompson and Cavaleri (2010) concurred with the findings of Metcalf and Benn (2012) that the achievement of organisational sustainability is contingent upon the intricate dynamics of a system. Effectively navigating this system necessitates a substantial amount of trial-and-error learning, resulting in the accumulation of considerable organisational knowledge.

Opoku et al., (2015) reported that different leadership styles result in distinct behavioural outcomes, and it is important to note that no single style can be universally deemed as the most effective in all circumstances. Leaders, nevertheless, must demonstrate adaptability and align their approach with the specific circumstances at hand (Opoku et al., 2015). This premise was reached by conducting a mixed-method research approach to check the sustainability practice of organisations within the UK construction industry. They conducted expert semi-structured interviews by interviewing 15 intra-organisational leaders responsible for promoting and implementing sustainability within their respective organisations. They also collected quantitative data by using questionnaires and got a response from 126 respondents.

5.2.2 The Role of Top Management in Corporate Sustainability

One potential approach to address the issues associated with Triple Bottom Line performance at the top management team (TMT) level is the implementation of a Chief Sustainability Officer (CSO) role. This position would be assigned to a TMT member whose primary responsibility is to oversee and manage corporate sustainability initiatives. Academic scholars have placed significant emphasis on the notion that the selection of executives who do not hold the position of Chief Executive Officer (CEO) typically corresponds with the strategic objectives of the organisation (Buyl et al., 2010). In a broader context, it has been observed that organisations are including C-level executives alongside the conventional top management team (TMT) comprising the CEO, CFO, and COO. This strategic move is aimed at effectively addressing the growing levels of institutional complexity (Krücken et al., 2017). According to Strand (2012), the allocation of significant resources, such as the appointment of an officer, to sustainability initiatives inside an organisation typically indicates an actual

dedication to sustainability issues and a desire to incorporate various performance objectives.

Henry et al. (2018) carried out research on 23 companies that were triple bottom-line leaders between 2005 and 2015 using the annual "Global 100" index and noted that there were no effects of the presence of a Chief Sustainability Officer. However, it was noted that the presence and ranking of organisations in the index are positively influenced by the functional variety of top management teams (TMTs).

According to Strand (2014), the establishment of Chief Strategy Officer (CSO) positions within senior leadership teams of corporations can be attributed to two main factors: the strategic-level position plays a crucial role in managing crises within organisations and aggressively seeking out external opportunities that may have generally been disregarded. This position provides concentrated attention and coordination, enabling effective resolution of crises and identification of untapped prospects. However, it appears that the CSO role has not yet solidified itself as a permanent fixture within the senior leadership teams of numerous prominent firms. In the year 2010, a total of 46 top management team positions were recognised as being linked to corporate sustainability. However, as of 2012, only 27 of these positions continue to exist. There has been a reduction of 41% during a span of two years. Therefore, the career trajectory of the Chief Sustainability Officer (CSO) seems to differ from that of the Chief Financial Officer (CFO) role. The CFO position was initially established in the TMT sector during the early 1960s and has since been an integral and permanent component within the TMTs of nearly all major organisations (Strand, 2014).

5.3 Implementation of Corporate Sustainability in Management Strategy

The predominant focus of CS contributions lies in the advancement of environmental management practises within the vicinity of organisations. This encompasses a range of activities, such as ongoing monitoring and management of environmental pollution, safeguarding endangered species, implementing effective environmental protection initiatives, optimising resource utilisation, and preparing for anticipated future challenges (Vardari et al., 2020). A correlation has been established between corporate sustainability and business performance (Wilshusen & MacDonald, 2017). The integration of corporate sustainability (CS) into a company's business strategy is imperative for its long-term viability, given the significant significance of social, environmental, and financial sustainability (Ashrafi et al., 2018).In conjunction with the environmental backdrop, sustainable practises have demonstrated various financial advantages, such as enhanced investor relations (Garcia-Sanchez et al., 2019; Serafeim, 2020), enduring returns even amidst economic downturns (Gomez-Bezares et al., 2016), long-term value generation for business proprietors through the utilisation of opportunities and risk mitigation (Kocmanova et al., 2017), as well as environmental and social accountability. The findings indicated that individuals who embraced CS at an early stage, as well as those who adopted it later, experienced numerous benefits. Given the existence of a sole operator within the sustainability market, it can be inferred that all generated revenue is accumulated by the pioneering entity. Nevertheless, individuals who adopt a product or technology at a later stage can derive advantages from the expansion and advancement of the market due to the cumulative effects generated by the market (Usar et al., 2019).

In their study on the incorporation of corporate sustainability into strategic management, Engert et al. (2016) conducted a comprehensive analysis of 114 peer-reviewed scientific journals published between 1991 and 2013. Through a meticulous

content analysis, the researchers found that the integration of sustainability into strategic management is predominantly discussed in literature streams that specifically focus on sustainability, rather than in research dedicated to strategic management. However, there continues to be a lack of empirical research, including both quantitative and qualitative studies, on the integration of corporate sustainability within the field of strategic management. However, there continues to be a lack of empirical research, including both quantitative and qualitative studies, on the integration of corporate sustainability within the field of strategic management. The existing scholarly discussion of the obstacles and difficulties faced in the process of integrating behaviour, including matters of complexity, internal communication, and the attitudes and behaviour of managers, demonstrates significant shortcomings. Furthermore, there seems to be a need for more endeavours aimed at the exploration and formulation of potential solutions. The argument suggests that a key concern in both scientific research and practical application is the reduction of complexity or the exploration of novel approaches to address complexity.

Rodrigues and Franco (2019) also reported after carrying out a systematic review of approximately 100 documents spanning from 2000 and 2019, on corporate sustainability and organisations' strategic management that further investigation is required regarding the development and execution of a sustainable strategy within organisations, with a specific focus on empirical studies. This is necessary to establish suitable models that effectively integrate the three dimensions of corporate sustainability with the objectives, competitive advantage, and internal/external legitimacy of organisations. The findings demonstrate a clear division and gap between the formulation of a comprehensive global strategy and the integration of a sustainable strategy inside it (Rodrigues and Franco, 2019).

To expand upon the findings of Engert et al. (2016), Suriyankietkaew and Petison (2019) undertook a bibliometric analysis, examining a total of 988 pertinent papers indexed in Scopus. This evaluation encompassed a time frame of 28 years, spanning from 1991 to 2019. The review encompassed a total of 636 scholarly journal articles, 212 conference papers, 78 literature reviews, 46 book chapters, 7 conference reviews, 5 books, and 4 brief surveys. Based on the conducted review, it has been observed that the domain of strategic management is still in its early stages of development as an area of academic research. This field primarily revolves around three prominent multidisciplinary approaches, namely environmental science, engineering, and business management and accounting, which play a significant role in promoting sustainability. The author suggests that contemporary leaders in organisations, business professionals, and entrepreneurs should prioritise strategic and visionary thinking in their practical endeavours. This may be achieved by reorienting their sustainability plans to adopt a more comprehensive and methodical approach.

In their study, Maas et al. (2016) conducted research on the integration of corporate sustainability assessment, management accounting, control, and reporting. They accomplished this by conducting a review of articles that examined the connections and partial connections between sustainability assessment, management control, and reporting. The authors observed that previous reviews predominantly examined each concept in isolation, and there has been limited research conducted on the interrelationships among these concepts. Additionally, it has been observed that there exists a certain level of ambiguity regarding the nature and scope of each notion, as well as their respective distinctions and the intended outcomes and impacts of the various approaches. Furthermore, it is worth mentioning that there is a scarcity of empirical studies that investigate existing firms, and even fewer research endeavours

have been dedicated to exploring the interplay and integration of these ideas. The proposal suggests the implementation of a comprehensive and integrated framework that encompasses all relevant concepts. This framework represents an initial endeavour to integrate previously isolated concepts, with the aim of facilitating a more thorough comprehension of their interrelationships. By adopting an integrated approach, both practitioners and researchers can enhance their understanding and effectively develop

strategies that account for the interconnectedness of these concepts. According to Pechancova et al. (2019), there is a positive relationship between foreign ownership and the adoption rate of Corporate Sustainability (CS) due to the escalating pressure levels and the subsequent demand for continuous workforce training.

According to several studies (Grewatsch & Kleindienst, 2018; Tomsic et al., 2015; Horisch et al., 2019; Pellegrini et al., 2018), managers with backgrounds in CS are inclined to give higher priority to addressing environmental and social issues. Additionally, they demonstrate an understanding of the significance of effective leadership in implementing solutions. Table 4.2 presents corporations in relation to implementing corporate sustainability in strategic management. The presented table provides the published Environmental, Social, and Governance (ESG) ratings and climate risk assessments of prominent firms across several nations. Although a majority of companies have prominent ESG ratings, it is noteworthy that many market giants in the United States, such as Apple Inc. and Domino's Pizza, are classified as having mediocre ESG ratings. In the United Kingdom, oil, and gas corporations such as Shell PLC and BP PLC have deficiencies in their Environmental, Social, and Governance (ESG) rating. Furthermore, their emissions targets are not in line with the desired global temperature with their emissions at 2.1°C and 3.4°C respectively. This

implies that the corporations are not in accordance with the ESG objective of limiting global warming to 1.5°C. The corporations should prioritise their sustainability objectives to align with the target of limiting global warming to 1.5°C, potentially influenced by the sector in which they operate. Rio Tinto Group, a firm operating in the United Kingdom, has been identified by MSCI as another entity that fails to meet its Environmental, Social, and Governance (ESG) objectives. The corporation in question is primarily engaged in the exploration, extraction, and refinement of various natural deposits found inside the Earth's geological formations. Despite setting a decarbonisation objective for the year 2050, there is a significant misalignment in their emissions goals, which were reported to be at 3.2 degrees Celsius. The company's ESG objectives are rather modest due to its involvement in previous structural issues, as indicated by the report. It is noteworthy to mention that the corporation does not align with any of the sustainable development goals established by the United Nations. It is imperative to conduct a comprehensive examination of the company's sustainability goals, emission targets, and sustainable development goals to ascertain their alignment with the established objectives aimed at limiting global warming to 1.5°C.

6.0 Conclusion

The primary goals of this research are to (1) determine the degree to which large companies are forthcoming about the sustainability of their operations, and (2) identify the part that leadership plays in the process of putting sustainability into practice. The findings of the study indicate that as the size of an organisation or corporation increases, there is a corresponding rise in the level of pressure they face to release a

bigger volume of information as a way to improve their credibility. Nevertheless, there is an opposing viewpoint suggesting that a higher degree of disclosure leads to an enhanced corporate social reputation. However, it is important to acknowledge that the content or depth of the given information does not impact this assertion. Although there is evidence that suggests a positive correlation between environmental performance and the practice of environmental disclosure, it is evident that there is a lack of collective discussion surrounding the importance of transparency in evaluating a company's sustainability performance. It is crucial to acknowledge that ESG scores may not provide a reliable measure of corporate sustainability, and the mere integration of ESG factors is insufficient for assessing an organization's sustainability performance. To establish the degree of transparency existing within an organisation, there are several approaches to explore. These approaches include the ratio of times that the organisation has disseminated a sustainability report over the course of the designated evaluated timeframe and the reliability of the report that is released. Another important factor in disseminating accurate sustainability reports is the frequency of reporting and the extent to which stakeholders communicate with one another. Stakeholders are more inclined to make sure that the right reports are disclosed because of the risk of losing out when issues arise from non-disclosure or wrong disclosure of the sustainability performance of the organisation.

In addition to the challenge associated with the disclosure of sustainability performance, there exists a concern regarding the extent of implementation that needs resolution. The GRI framework serves as a metric for assessing the extent to which sustainability reports align with the G3 principles. The G3 guidelines format is flexible, and this allows organisations to continually improve their sustainability practices. The Guidelines undergo incremental updates. This method signifies a departure from the prior iterations, wherein the complete set of Guidelines underwent review (Matthews, 2010).

Also, the frequency with which an organisation’s sustainability report is subjected to third-party assessment by GRI is another variable that represents the extent to which the organisation is transparent in its reporting. According to this research, only a small amount of reporting done in the United Kingdom can be seen as credible because of the very low independent checks which is just a little over 11% of the over 4,000 reports published in the UK. The lack of consistent independent checks, auditing of sustainability reports, and the use of other metrics in measuring transparency make it easy for these organisations to get involved in greenwashing. To reduce the level of greenwashing and misrepresentation of reports, the relevant bodies and organisations need to complete consistent independent checks on published reports to confirm the transparency level of the firms. In summary, it can be asserted that a significant proportion of organisations have not yet embraced the triple-bottom-line approach. Further studies can be carried out to determine how best companies can successfully

integrate transparency in their sustainability reporting as it is observed that there is still a lag in the representation of sustainability reporting by many large corporations.

Transparency plays a crucial role in sustainability reporting, necessitating regular adherence to sustainability norms and principles by organisational leadership to effectively demonstrate this commitment. The delineation of leadership's role in facilitating the effective execution of sustainability initiatives is of paramount significance. As earlier stated, there have been several scandals that have involved large corporations in significant environmental catastrophes leading to major environmental challenges and loss of human life. To ensure that these happenings are kept to the barest minimum or do not happen at all, it is important to understand the role that leadership plays in implementing corporate sustainability. It should be noted that the significance of leadership concerning business sustainability has been extensively acknowledged, indicating the necessity for a comprehensive understanding of leadership to effectively implement sustainable practices. Several elements play a crucial role in determining the effectiveness of sustainability implementation. These aspects include the corporate culture, knowledge, managerial attitudes, and behaviour. In addition to the aforementioned traits, it is important to consider the impact of employee engagement and effective communication on the successful implementation of sustainability within the company. Achieving optimal coherence and effectiveness necessitates the alignment of strategy, organisational structure, and organisational processes.

Various organisations employ a range of leadership styles, and examining these styles helps enhance the adaptability and facilitation of sustainability initiatives. Transformational leadership plays a crucial role in facilitating the integration of sustainable practices, as it is characterised by responsible leadership behaviours that have a positive influence on the workforce. The successful implementation of corporate sustainability is influenced by various leadership styles due to the intricate

nature of sustainability. Sustainability leaders should possess the capability to anticipate and navigate intricate challenges, effectively involve many stakeholders in flexible and adaptive organisational transformations, and adeptly handle emotional dynamics. In essence, it is imperative for sustainability leaders to possess a flexible mindset and demonstrate the capacity to adjust their approaches in response to evolving environmental demands. The utilisation of many leadership styles yields diverse consequences, and it is crucial to acknowledge that no singular style can be generally regarded as the utmost beneficial in all situations.

In response to the challenges posed by the triple bottom line, organisations have included the position of a Chief Sustainability Officer within their senior management team. This strategic move aims to effectively tackle the intricate nature of sustainability

implementation within the firm. Nevertheless, the establishment of the TMT position aimed at addressing these intricacies has yielded limited impact. Research has indicated that a significant number of the top management team (TMT) jobs that were established have subsequently been reclassified as middle-level management positions. Consequently, the mere establishment of these roles does not necessarily address the challenges related to the implementation of corporate sustainability.

For businesses to effectively implement corporate sustainability, organisations must establish a systematic approach that facilitates ongoing monitoring and management of environmental pollution, preservation of threatened species, the implementation of impactful environmental protection initiatives, optimisation of resource utilisation, and proactive preparation for anticipated future challenges.

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Titah Michael Tanda(Author) *Gic Novagro International Enterprise* **Eze Ada Jennifer(Co-Author)**	**Agribusiness Innovation and Youth Employment through Agro-Based Product Development: The GIC NOVAGRO Model**

Abstract

Agribusiness holds transformative potential for addressing youth unemployment and underdevelopment across Africa. This paper presents the innovative model of GIC NOVAGRO INTERNATIONAL ENTERPRISES, a Nigerian-based agroprocessing company that uses locally sourced agricultural inputs such as palm kernel oil, turmeric powder, neem oil, and honey to produce high-quality, natural bathing soaps. With plans to expand into body lotions, facial creams, and detergents, GIC NOVAGRO aims to further add value to agricultural raw materials and create sustainable employment opportunities for youth and women in rural communities.

Through skills training, supply chain integration, and value-added production, GIC NOVAGRO exemplifies how agribusiness can serve as a bridge between agriculture, entrepreneurship, and industrialization. The enterprise seeks to expand its operations and impact by attracting investment and strategic partnerships, while also positioning its model as a replicable blueprint for agroindustrial development in Africa. This presentation aims to share insights, challenges, and opportunities in aligning agricultural innovation with inclusive economic growth.

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