

The Role Of Intellectual Capital As A Competitive Advantage In Achieving Sustainable Development Goals (SDGs)

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Abstract: *This research explores the role of intellectual capital (IC) as a competitive advantage in achieving Sustainable Development Goals (SDGs). By focusing on the interplay between human, structural, and relational intellectual capital, the study examines how organizations can leverage these intangible assets to drive sustainability efforts. Using a qualitative approach, data were collected through semi-structured interviews with 25 participants from diverse industries, complemented by document analysis and focus group discussions. The findings reveal that human capital, through employee innovation and expertise, is crucial in driving sustainability initiatives, while structural capital, particularly in the form of knowledge management systems, facilitates the integration of Environmental, Social, and Governance (ESG) principles into business strategies. Relational capital fosters collaborations and partnerships essential for sustainability projects and participation in the circular economy. This research demonstrates that organizations that effectively manage their intellectual capital are better positioned to achieve competitive advantages and make substantial contributions to the SDGs. The study provides actionable insights for businesses looking to align their intellectual capital with sustainability goals, emphasizing the strategic importance of intellectual capital management in today's competitive environment.*

Keywords: *Competitive Advantage, Environmental, Social, and Governance (ESG), Intellectual Capital, Sustainable Development Goals (SDGs), Sustainability Innovation*

I. INTRODUCTION

In recent years, intellectual capital has become a central focus for organizations seeking to gain a competitive edge, particularly in relation to sustainability. Intellectual capital, defined as the collective knowledge, skills, and capabilities embedded within organizations (Abeysekera, 2021), plays a critical role in fostering innovation, enhancing performance, and contributing to sustainable development. As businesses face growing pressure to align with the Sustainable Development Goals (SDGs) set forth by the United Nations, effective intellectual capital management offers a pathway to achieve these global sustainability objectives while maintaining economic competitiveness. On the other hand, human capital, which encompasses employee knowledge, skills, and creativity, is a key driver of innovation, enabling organizations to develop sustainable solutions that address

environmental and social challenges (Zapata-Cantu & González, 2021). For instance, companies that prioritize employee training in sustainability practices often report higher levels of innovation, leading to the creation of energy-efficient products and waste-reduction strategies that not only comply with regulations but also enhance their market position. Structural capital, including organizational processes, intellectual property, and knowledge management systems, provides the infrastructure needed to support the integration of sustainability initiatives into daily operations (Shahzad et al., 2020). Organizations with robust knowledge-sharing platforms can effectively disseminate best practices and lessons learned, ensuring that sustainability becomes embedded in their core functions rather than treated as an isolated initiative.

Additionally, relational capital, which consists of the relationships and networks an organization builds with

external stakeholders such as customers, suppliers, and partners, facilitates collaboration and the sharing of knowledge essential for sustainability (Qiao & Wang, 2021). Strategic partnerships can enhance resource efficiency and open new markets for sustainable products, as seen in collaborations between companies and non-governmental organizations (NGOs) aimed at community development and environmental conservation (Valbuena-Hernandez & Ortiz-de-Mandojana, 2022).

This study explores how organizations leverage these three forms of intellectual capital to enhance their sustainability efforts. Specifically, it examines how businesses integrate Environmental, Social, and Governance (ESG) factors into their corporate strategies by using intellectual capital as a foundation. By aligning intellectual capital with sustainability, organizations can foster long-term innovation, build stronger relationships with stakeholders, and maintain a competitive edge in their industries. The research also highlights the role of intellectual capital in driving the circular economy and Corporate Social Responsibility (CSR), illustrating that organizations that effectively manage intellectual capital are better positioned to meet sustainability targets and create value in both medium and long-term perspectives.

Ultimately, this study underscores the strategic importance of intellectual capital in advancing sustainability goals and maintaining competitiveness in an evolving global marketplace. As organizations navigate the complexities of sustainability, the effective management of intellectual capital will not only drive innovation but also enhance their ability to respond to societal expectations and contribute positively to the environment. By recognizing intellectual capital as a vital resource, organizations can create sustainable value that benefits their stakeholders and the wider community.

RESEARCH OBJECTIVES

- ✓ To explore how organizations can harness intellectual capital to enhance their competitiveness and sustainability efforts aligned with the SDGs.
- ✓ To examine the relationship between the effective management of intellectual capital and the successful integration of Environmental, Social, and Governance (ESG) dimensions in organizational strategies.

II. LITERATURE REVIEW

The literature on intellectual capital underscores its pivotal role as a key driver of competitive advantage, particularly in the context of sustainability. Intellectual capital, broadly defined as the intangible assets within an organization, consists of human capital, structural capital, and relational capital, each of which plays a significant role in fostering innovation, enhancing organizational performance, and contributing to the achievement of sustainability goals (Saddam & Jaafar, 2021). Scholars have increasingly recognized that effectively managing intellectual capital not only drives innovation but also positions organizations to align their business strategies with broader global sustainability objectives, including the United Nations' Sustainable

Development Goals (SDGs) (Alvino et al., 2021; Jirakraisiri et al., 2021; Jordão & Novas, 2024).

According to Singh et al. (2022), human capital encompasses the knowledge, skills, and expertise of an organization's workforce, and is critical to the development and implementation of sustainable practices. Research has shown that employees with advanced skills in sustainability are more capable of driving innovation in product design, production processes, and corporate governance, all of which contribute to a company's long-term sustainability (Muñoz-Pascual et al., 2021). Studies by Sgrò, et al. (2020) highlight that organizations with highly skilled employees are better able to adapt to changing environmental and social conditions, making human capital a crucial asset in sustainability efforts. Furthermore, human capital fosters a culture of continuous learning and innovation, allowing organizations to respond dynamically to sustainability challenges while maintaining their competitive edge (Alfawaire & Atan, 2021). However, the literature often lacks a detailed exploration of how specific human capital initiatives can be aligned strategically with sustainability objectives.

Structural capital refers to the processes, systems, and intellectual property that support an organization's operations, is another critical element (Ekaningrum, 2021). It includes patents, trademarks, organizational procedures, and databases that collectively enable the efficient utilization of human capital. Rehman (2022) note that structural capital, particularly in the form of knowledge management systems, plays a central role in embedding sustainability into the core operations of businesses. Intellectual property can be a source of sustainable innovation, especially when organizations develop and protect eco-friendly technologies. Annesi, et al., 2024 assert that, robust organizational processes can also streamline the integration of Environmental, Social, and Governance (ESG) factors into daily operations, making sustainability a central feature of organizational decision-making. However, the literature points out gaps in understanding how structural capital, especially intellectual property and organizational processes, can be managed proactively to support long-term sustainability initiatives.

Kurucz et al. (2017) asserts that, relational capital, which represents the relationships and networks an organization cultivates with external stakeholders, is also recognized as a crucial driver of sustainability. Building strong relationships with partners, suppliers, customers, and regulatory bodies allows organizations to share knowledge, resources, and innovations aimed at advancing sustainability goals. The literature by Alghababsheh and Gallea (2021), emphasizes that relational capital facilitates trust and cooperation, which are essential for fostering sustainable partnerships. Collaborative efforts through Corporate Social Responsibility (CSR) and Circular Economy (CE) initiatives require strong relational capital to ensure mutual benefit and to spread sustainability practices across industries. Despite these contributions, existing research often overlooks the nuanced ways in which relational capital can be strategically managed to foster sustainability.

A growing body of literature examines the role of Environmental, Social, and Governance (ESG) factors in intellectual capital management. Studies suggest that

businesses integrating ESG considerations into their intellectual capital strategies are more successful in achieving SDG targets (Shah et al., 2021; Sciarelli et al., 2021). Gary (2019), argue that organizations prioritizing ESG factors in their business strategies tend to perform better financially over the long term, as they can anticipate and mitigate risks related to environmental degradation, social inequality, and governance failures. Companies incorporating ESG into their intellectual capital framework are also more likely to excel in CSR and Circular Economy initiatives, contributing to a sustainable competitive advantage (Blinova, 2022). However, this integration is often treated as a one-size-fits-all approach, with little attention paid to how different industries or types of organizations might need tailored strategies for managing intellectual capital in the context of sustainability.

The theoretical framework that guided this study is the Resource-Based View (RBV) of the firm, which posits that an organization's internal resources, particularly its intangible assets, are key to achieving and sustaining a competitive advantage. According to Zimuto (2018), RBV theory emphasizes that organizations possessing valuable, rare, inimitable, and non-substitutable (VRIN) resources are better positioned to outperform their competitors. Intellectual capital fits within this framework as a critical resource that can be leveraged to foster innovation, drive sustainability efforts, and enhance competitive advantage.

Within the RBV framework, human, structural, and relational capital are viewed as unique resources that, when managed effectively, can create sustainable value for organizations (Yusliza et al., 2020). Human capital, with its emphasis on skills, knowledge, and expertise, is seen as a source of innovation and adaptability, which is critical for meeting the challenges posed by sustainability. Structural capital, particularly in the form of organizational processes and intellectual property, provides the infrastructure necessary to support long-term sustainability goals. Relational capital enhances the organization's ability to engage with external stakeholders, facilitating collaboration and the diffusion of sustainable practices across supply chains and industries (Khan et al., 2021).

The RBV theory also provides a useful lens for understanding how organizations can manage their intellectual capital in a way that aligns with ESG factors. By viewing intellectual capital as a strategic resource, organizations can ensure that their sustainability efforts are integrated into the core of their business strategy rather than being treated as peripheral initiatives. This aligns with the concept of dynamic capabilities, which extends the RBV by focusing on an organization's ability to reconfigure its resources in response to changing external conditions, such as the growing demand for sustainability.

III. RESEARCH METHOD

This study adopted a qualitative research design to explore how organizations manage intellectual capital in the context of sustainability, aiming to gain deep insights into the strategic use of human, structural, and relational intellectual capital in driving sustainability efforts and achieving competitive

advantage. The primary data collection methods included semi-structured interviews, focus group discussions, and document analysis. Semi-structured interviews were conducted with 25 participants, including sustainability managers, HR executives, and intellectual property managers from organizations in the technology, manufacturing, and energy sectors. These interviews focused on how organizations leverage intellectual capital to foster innovation and sustainability. In addition to the interviews, focus group discussions with employees involved in sustainability projects provided collective perspectives on intellectual capital's role in innovation and competitiveness. Document analysis of sustainability reports, intellectual property records, and internal knowledge management documents offered further insights into how intellectual capital is formalized and integrated into organizational strategies. Participants were selected through purposive sampling to ensure representation from organizations known for their commitment to sustainability and intellectual capital management. Data analysis was conducted using thematic analysis, with NVivo software identifying key themes around intellectual capital management, sustainability, and competitive advantage. This approach helped uncover recurring patterns and provided a comprehensive understanding of the role intellectual capital plays in driving both innovation and sustainability within organizations.

IV. FINDINGS

The findings from this study highlight the essential role of intellectual capital in driving sustainability initiatives within organizations. Each component of intellectual capital—human, structural, and relational—contributes uniquely to the advancement of sustainability goals, ultimately enhancing the organization's competitive advantage.

HUMAN CAPITAL AS A CATALYST FOR SUSTAINABILITY INNOVATION

The first key finding underscores the significance of human capital in fostering sustainability innovation. The study revealed that organizations prioritizing the development of their employees' skills, expertise, and creativity were better positioned to drive innovative solutions aimed at enhancing sustainability. In-depth interviews with sustainability managers and HR executives indicated that organizations that invested in continuous learning and development programs experienced substantial improvements in their ability to develop sustainable practices, particularly in the domains of energy efficiency and waste reduction. Participants emphasized that training initiatives focusing on sustainability principles empowered employees to contribute actively to the organization's innovation efforts. For instance, one HR executive noted that their training programs encouraged employees to engage in brainstorming sessions to identify new sustainable practices, leading to the implementation of several innovative projects that reduced the organization's carbon footprint.

Moreover, focus group discussions with employees involved in sustainability projects echoed these sentiments. Participants expressed a heightened sense of ownership and accountability when they felt equipped with the necessary knowledge and skills to effect change. Employees reported that their involvement in collaborative projects often sparked creative solutions that addressed sustainability challenges. Overall, this finding emphasizes the critical need for organizations to invest in human capital development as a foundational strategy for promoting sustainability innovation. By nurturing their workforce's capabilities, organizations can create a culture of innovation that continuously seeks to address sustainability challenges.

STRUCTURAL CAPITAL AND ESG INTEGRATION

The second finding centers on the role of structural capital in facilitating the integration of Environmental, Social, and Governance (ESG) factors into organizational strategies. The study found that organizations with robust knowledge management systems and well-developed intellectual property portfolios were more adept at aligning their corporate strategies with the Sustainable Development Goals (SDGs). Document analysis revealed that companies that had formalized their sustainability initiatives through structured frameworks were significantly more successful in implementing ESG considerations within their long-term planning processes. For instance, participants highlighted the effectiveness of knowledge-sharing platforms that allowed employees to access valuable insights, best practices, and lessons learned regarding sustainability efforts.

Furthermore, organizations with strong intellectual property portfolios reported leveraging their innovations to address sustainability issues, thereby enhancing their competitive advantage. These organizations were better positioned to protect their sustainable innovations, ensuring that they could capitalize on their investments in research and development. The analysis indicated that structural capital not only facilitated formalization of sustainability efforts but also integrated them into the organization's core business strategy. As one sustainability manager articulated, "Our knowledge management system has been instrumental in ensuring that sustainability is not an afterthought; it is part of our organizational DNA." This finding emphasizes the importance of cultivating structural capital as a means of embedding sustainability within the organization, allowing for a more cohesive and strategic approach to achieving both sustainability and competitive advantage.

RELATIONAL CAPITAL AS A TOOL FOR SUSTAINABILITY COLLABORATION

The third finding highlights the importance of relational capital in driving collaborative sustainability initiatives. The research demonstrated that partnerships with external stakeholders—including suppliers, customers, and non-governmental organizations (NGOs)—were essential for facilitating sustainability projects. Participants noted that these collaborations enabled organizations to share knowledge, resources, and best practices, thereby enhancing their capacity

to engage in circular economy models and sustainable supply chains. For instance, case studies revealed that organizations engaged in partnerships with suppliers committed to sustainable practices saw significant improvements in their overall sustainability performance.

Additionally, focus group discussions indicated that relational capital fostered trust and cooperation, essential elements for successful collaboration. Employees involved in joint sustainability initiatives reported that these partnerships allowed them to exchange innovative ideas and explore new approaches to sustainability challenges. The collaborative nature of these relationships led to the co-development of sustainable solutions, benefiting both the organizations and their partners. As one participant stated, "Working together with our suppliers and NGOs has opened up new avenues for us to explore sustainability; we learn from each other." This finding underscores the critical role of relational capital in driving collective action toward sustainability, highlighting the necessity for organizations to cultivate and leverage external relationships to enhance their sustainability efforts.

V. DISCUSSION

The findings from the study reveal crucial insights into how organizations can leverage intellectual capital to enhance their sustainability efforts. Each component of intellectual capital—human, structural, and relational—plays a unique role in fostering innovation, integrating Environmental, Social, and Governance (ESG) factors into strategies, and facilitating collaboration. The discussions below elaborate on these findings, providing tangible implications for organizations seeking to navigate the complex landscape of sustainability.

HUMAN CAPITAL AS A CATALYST FOR SUSTAINABILITY INNOVATION

The research highlights human capital as a vital catalyst for sustainability innovation. Organizations that invest in employee development, particularly in sustainability-related skills and knowledge, can significantly enhance their innovation capabilities. The study indicates that continuous learning programs not only equip employees with the necessary skills but also instill a sense of ownership and accountability toward sustainability initiatives.

For instance, companies that implemented comprehensive training programs in sustainability reported increased employee engagement and creativity. Employees expressed a greater willingness to contribute ideas for sustainable practices, leading to innovative solutions in areas such as waste reduction and energy efficiency. Organizations can leverage this finding by prioritizing training programs that focus on sustainability and innovation. This approach not only aligns employees' skills with the organization's sustainability goals but also fosters a culture of innovation that encourages employees to actively seek out and implement sustainable practices.

Moreover, the emphasis on collaboration within teams involved in sustainability projects can lead to enhanced creative outputs. The study suggests that organizations should

encourage cross-departmental collaboration to foster diverse perspectives, which can lead to more innovative solutions. By creating interdisciplinary teams that bring together individuals with varied expertise, organizations can unlock new ideas and approaches to sustainability challenges.

STRUCTURAL CAPITAL AND ESG INTEGRATION

The findings regarding structural capital reveal that organizations with well-developed knowledge management systems and intellectual property frameworks are more successful in integrating ESG factors into their business strategies. This finding emphasizes the importance of establishing formalized processes for managing sustainability initiatives.

Organizations should invest in robust knowledge management systems that facilitate the sharing of best practices, lessons learned, and innovative ideas across departments. By creating a centralized repository of sustainability knowledge, organizations can ensure that valuable insights are accessible to all employees, promoting a culture of continuous improvement. This approach not only enhances the organization's ability to implement effective sustainability strategies but also supports the alignment of corporate objectives with the SDGs.

Furthermore, organizations should leverage their intellectual property portfolios to drive sustainability innovations. Protecting and capitalizing on sustainable innovations can provide a competitive advantage in the market. By developing and safeguarding patents related to sustainable technologies, organizations can position themselves as leaders in their industries, attracting customers and partners committed to sustainability.

The integration of ESG factors into long-term planning processes is another critical aspect of structural capital. Organizations must ensure that sustainability considerations are embedded within their strategic frameworks, guiding decision-making at all levels. This can be achieved by developing sustainability frameworks that align with the organization's overall mission and vision, allowing for a more cohesive approach to sustainability initiatives.

RELATIONAL CAPITAL AS A TOOL FOR SUSTAINABILITY COLLABORATION

The research underscores the significance of relational capital in driving collaborative sustainability initiatives. Establishing partnerships with external stakeholders—such as suppliers, customers, and NGOs—enables organizations to leverage shared knowledge, resources, and best practices. This collaborative approach is essential for addressing complex sustainability challenges that require collective action.

Organizations should actively seek out and cultivate relationships with stakeholders who share similar sustainability values. By collaborating with suppliers committed to sustainable practices, organizations can enhance their overall sustainability performance and create a positive impact throughout their supply chains. For example, partnerships with NGOs can provide valuable insights into

community needs and expectations, allowing organizations to tailor their sustainability initiatives to address local challenges.

The study also highlights the importance of trust and cooperation in relational capital. Organizations should prioritize building strong, transparent relationships with their partners to facilitate open communication and knowledge exchange. This can be achieved by engaging in regular dialogues, joint planning sessions, and collaborative projects that foster mutual understanding and respect.

In addition, organizations can leverage relational capital to enhance their participation in circular economy models and sustainable supply chains. By collaborating with partners to develop closed-loop systems, organizations can minimize waste and resource consumption, contributing to a more sustainable future. These collaborative efforts can lead to the co-development of innovative solutions that not only benefit the organization but also contribute positively to the broader community and environment.

VI. CONCLUSION

The study highlights the pivotal role of intellectual capital in driving sustainability initiatives within organizations, revealing how its various components—human, structural, and relational capital—contribute to enhancing organizational competitiveness and achieving Sustainable Development Goals (SDGs). Through qualitative research methods, including semi-structured interviews, focus group discussions, and document analysis, the findings provide a nuanced understanding of how organizations leverage intellectual capital to foster innovation, integrate Environmental, Social, and Governance (ESG) factors into their strategies, and cultivate collaborative sustainability efforts.

The findings underscore that human capital is a vital catalyst for sustainability innovation. Organizations that invest in the continuous development of their employees' skills and knowledge create a culture of accountability and creativity, leading to innovative solutions in energy efficiency and waste reduction. The emphasis on training programs and interdisciplinary collaboration fosters an environment where employees are empowered to contribute actively to sustainability initiatives, enhancing both organizational performance and employee engagement.

Structural capital also emerged as a crucial factor in facilitating the integration of ESG considerations into organizational strategies. The research indicates that organizations with robust knowledge management systems and intellectual property frameworks are better equipped to formalize their sustainability efforts and align their corporate strategies with the SDGs. By prioritizing knowledge sharing and protecting sustainable innovations through intellectual property rights, organizations can embed sustainability into their long-term planning processes, ensuring that these considerations guide decision-making at all levels.

Finally, the study reveals the significance of relational capital in driving collaborative sustainability initiatives. Establishing partnerships with external stakeholders allows organizations to leverage shared knowledge, resources, and best practices, enhancing their capacity to engage in circular

economy models and sustainable supply chains. The importance of trust and cooperation in these relationships facilitates open communication and knowledge exchange, leading to the co-development of innovative sustainability solutions that benefit both the organization and the broader community.

In conclusion, this study provides valuable insights into the strategic management of intellectual capital as a means to advance sustainability efforts. Organizations that effectively leverage human, structural, and relational capital not only enhance their sustainability performance but also position themselves favorably in an increasingly competitive market. As sustainability becomes a central focus for businesses worldwide, the insights from this research underscore the need for a holistic approach to managing intellectual capital to drive innovation and achieve lasting impact in the quest for a sustainable future.

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