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A Conceptual Paper on the Effects of Green Intellectual Capital on Business Sustainability

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Abstract: Businesses today are placing greater emphasis on sustainability and environmental concerns. More and more firms are making sustainability their top priority to stay ahead of their competitors. Since we now operate in a knowledge-based economy, intangible assets have emerged as an essential measure for evaluating a company's competitive advantage. Academics developed the notion of green intellectual capital (GIC) to encourage firms to care more about their environmental impact. In this conceptual paper, we aim to investigate the relationship between Green Intellectual Capital and the sustainability of a business. The goal of this study was to present a literature review on the impact of Green Human Capital (GHC), Green Structural Capital (GSC), and Green Relational Capital (GRC) on business sustainability. Despite the growing importance of GIC research in developing countries, scholars have devoted little attention to the subject, particularly in the Malaysian context. The findings indicate that all three concepts of Green Intellectual capital positively influence the sustainability performance of businesses.

Keywords: *Business sustainability; Green intellectual capital; Green Human Capital; Green Structural Capital; Green Relational Capital.*

1. Introduction

Over the past century, rapid industrialization has caused major environmental issues like climate change, water pollution, and deforestation (Boso, Adusei, & Demah, 2022; Wang & Juo, 2021). Business corporations must acknowledge the need to protect the environment as business is dependent on nature for the resources they need to provide customers with goods and services (Ullah et al., 2021). This has led many businesses to implement green strategies in their activities. Organizations can attain a competitive advantage over their counterparts by developing strategies that prioritize both profit optimization and environmental conservation (Commer, Sci, Chaudhry, & Chaudhry, 2022). Nonetheless, many businesses are unclear about the necessary measures and strategies to implement. Furthermore, one could argue that government environmental restrictions are insufficient for effectively implementing sustainable business practices (Yusoff, Omar, Kamarul Zaman, & Samad, 2019a). Therefore, for organizations to effectively adapt to the present trend of environmental shift, it has become vital for them to come up with an innovative strategic strategy that goes beyond the domain of optional considerations and assumes a pivotal position in the operations of all entities (Ray & Grannis, 2015; Yusoff, Omar, Kamarul Zaman, et al., 2019a).

According to Allameh & Abbas, (2011), since we are living in an economy that is based on knowledge, the importance of intangible resources as a strategic competitive advantage has exceeded that of tangible resources. Yadiati, Nissa, Paulus, Suharman, & Meiryani, (2019) in their studies stated that the literature on intangible assets has primarily focused on establishing their association with monetary, social, and economic factors. However, their connection with environmental performance remains relatively understudied. Academics have come up with the concept of green intellectual capital (GIC) as the determinant for businesses to be more aware of their impact on the environment (Jadoon, Ali, Ayub, Tahir, & Mumtaz, 2021). Chen, (2008) introduced the term GIC as "the total stocks of all kinds of intangible assets, knowledge, capabilities, and relationships, etc. about the environmental protection or green innovation at the individual level and the organizational level within a company". Chen, (2008) undertook a comprehensive investigation of green intellectual capital, identifying three key components: green human capital (GHC), green structural capital (GSC), and green relational capital (GRC).

Green human capital (GHC) encompasses the collective knowledge, skills, capabilities, experience, attitude, wisdom, creativities, and commitments possessed by employees, specifically in relation to environmental

preservation and the development of green innovation (Chen, 2008; p.277). According to Wang & Juo, (2021), if a company effectively implements the concept of GHC, the employees will possess adequate knowledge and skills to address environmental concerns. Thus, with the existence of qualified GHC, organizations' readiness to generate business benefits can be enhanced. According to the management literature, the presence of qualified GHC can enhance an organization's readiness to generate business benefits. This is due to the fact that a more knowledgeable workforce possessing superior green skills is better equipped to address environmental concerns, which in turn can help sustain economic performance (Pellegrini, Rizzi, & Frey, 2018).

The second component in GIC is Green Structural Capital (GSC). Chen (2008; p. 277) defines green structural capital as the summation of "capabilities, commitments, knowledge management systems, reward systems, information technology systems, databases, managerial mechanisms, operation processes, managerial philosophies, organizational culture, company images, patents, copyrights, and trademarks, etc. about environmental protection or green innovation within a company." The provision of organizational support by green structural capital is crucial for establishing management mechanisms and systems that help the incorporation of environmental technological knowledge and the incorporation of environmental initiatives across the firm (Amores-Salvadó, Cruz-González, Delgado-Verde, & González-Masip, 2021).

The third component of GIC, Green Relational Capital (GRC) is defined as "the stocks of a company's interactive relationships with customers, suppliers, network members, and partners about corporate environmental management and green innovation, enabling it to create fortunes and obtain competitive advantages" (Chen, 2008; p. 277). The utilization of green structural capital can provide the required support to steer the organization's ecological endeavors. Prior research has indicated that a company possessing robust green structural capital is likely to achieve optimal outcomes in terms of environmental strategy (Amores-Salvadó et al., 2021; Mansoor, Jahan, & Riaz, 2021). Even though the study of GIC in developing countries is becoming more important, researchers haven't paid much attention to the topic, especially in the Malaysian context. Limited study has been conducted to establish a connection between the role of GIC and the sustainability of businesses. This can be attributed to the novelty of the concept, which is still in the explorative stage. Thus, through reviews of the literature, this study is expected to fill up the inconclusive research gap on the effect of GIC on business sustainability and thus provide more understanding of the effectiveness of GIC towards business performance and business sustainability subsequently.

Need of the Study: The purpose of this article is to investigate the impact that green intellectual capital (GIC) has on the long-term viability of businesses. A review of the pertinent literature will serve as the foundation for our response to the inquiry. Although research on GIC in developing nations is becoming increasingly significant, scholars have not focused a great deal of attention on the topic, particularly in the context of Malaysia. So far, there has been very little discussion on the role of GIC in business sustainability as it is a relatively new concept and is still in an explorative stage. Among the studies worth mentioning are the following studies (Ahmad Yahya, Arshad, Kamaluddin, & Wan Abdullah, 2022; Suki, Suki, Sharif, Afshan, & Rexhepi, 2022; Yong, Yusliza, Ramayah, & Fawehinmi, 2019; Yusoff, Omar, & Kamarul Zaman, 2019). According to the extant literature, the influence of GIC on a company's performance is likely to be contradictory. The particular impacts of GIC dimensions on performance, however, remain ambiguous (Chaudhary & Kumar, 2021). Thus, this study aims to fill the knowledge gap in the existing literature.

This research is anticipated to yield numerous insights. With the likelihood of positive associations between GIC and business sustainability, organizations should be able to leverage their intangible assets as a strategic business strategy to achieve sustainability performance. This research is also anticipated to have theoretical implications. In addition, it is anticipated that this research will contribute to the scant literature on the relationship between GIC and business sustainability.

Objectives of the Study: This study aims to investigate the effect of intangible resources on the sustainability of businesses. To achieve this goal, the following specific objectives will be addressed.

To determine the correlation between the dimensions of Green Intellectual Capital (GIC), namely Green Human Capital, Green Social Capital, and Green Relational Capital, and the concept of Business Sustainability.

2. Underpinning Theory

The theoretical root of the study is founded on the fundamental principles of the resource-based view (RBV), intellectual capital view (ICV) and "knowledge-based view". The Resource-Based View (RBV) theory explains the process by which a firm can leverage strategic resources and/or capabilities to attain a competitive edge (Agyabeng-Mensah & Tang, 2021). Organizations can improve their sustainability performance and long-term viability by incorporating sustainable practices and resource management into their strategies. Given the significance of organizational assets and resources in aiding a company's productivity and growth, the usability of an organization's intangible assets is critical in improving its overall performance (Yadiati et al., 2019). Additionally, scholars have reached a consensus that the sustainability of organizations is also heavily dependent on intangible assets (Obeng, 2019) which in turn, guarantees their competitive edge. These intangible assets are known as intellectual capital. According to certain scholars, the Resource-Based View (RBV) theory is inadequate in providing a comprehensive depiction of competitive advantage (Sheikh, 2021).

Therefore, the attainment of environmental resources and capabilities should be incorporated to achieve a competitive edge in contemporary and future business environments (Hart, 1995). However, according to Hart (1995)'s Resource-Based View (RBV) fails to recognise the interdependence of the natural environment and the theory. Empirical evidence suggests that organizations having larger amounts of Intellectual Capital tend to have superior levels of operational excellence in comparison to those with lower resources of Intellectual Capital (Jiao, Zhang, He, & Li, 2022). The Intellectual Capital View (ICV) is more detailed than the Resource-Based View (RBV), as it considers three resources that are conceptually linked to an organization's competitive advantage: human capital, relational capital, and structural capital. (Astuti & Datrini, 2021). Knowledge-based view theory on the other hand explicated that an organization's knowledge is the most valuable strategic asset because it can be used to create intangible assets (in this case, intellectual capital assets) that can be used to gain a competitive advantage and fuel both organizational and financial growth (Benevene, Buonomo, Kong, Pansini, & Farnese, 2021).

3. Business Sustainability

The concept of sustainability is presently a topic of discussion and inquiry in various research endeavors worldwide. This has resulted in the proliferation of diverse conceptual interpretations, tailored to the specific objectives of each research undertaking. In 1987, the World Commission on Environment and Development (WCED) released a seminal publication entitled "Our Common Future," also known as the Brundtland Report. The document has set the groundwork for a comprehensive framework of sustainability, which aims to find a balance between the underlying conflicts between protecting the environment and pursuing development goals. In the report, sustainability was defined as the “development which meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1987).

In addition, the triple bottom line principle is a means of distinguishing the threefold nature of sustainability, which includes the social, environmental, and economic aspects (Yong, Yusliza, Ramayah, Farooq, & Tanveer, 2022). Achieving sustainability within an organization requires the development and execution of plans and policies that go beyond only pursuing financial profits. It is essential to integrate a genuine concern for the environment into the organizational structure, encompassing the preservation of ecological balance and the responsible exploitation of natural resources. It is crucial to recognize that these discussions should not be interpreted as unnecessary expenditures, but rather as a manifestation of the institution's commitment to the well-being of its members and the wider society (Suki et al., 2022). In line with this concept, it is crucial to assert that for a company to be regarded as sustainable; it must not only emphasize profitability but also consider the societal and ecological implications of its choices. In the context of this study, business sustainability refers to the organizational goal of maximizing profit and fostering social development while considering environmental factors (Galpin, Whittington, & Bell, 2015). Based on this concept, sustainability encompasses three dimensions, namely economic, social, and environmental. Economic performance refers to financial performance, whereas environmental performance seeks to reduce environmental damage and resource depletion. Social performance refers to the well-being of stakeholders, including customers, societies, and employees.

Green Intellectual Capital: Intellectual Capital (IC) was introduced by John Kenneth Galbraith in 1969 with Tom Stewart popularizing it in 1991 (Yusoff, Omar, Kamarul Zaman, & Samad, 2019b). The IC concept has generated a great deal of discussion, resulting in a plethora of literature across multiple disciplines. Despite the abundance of academic discussions around the concept of IC, the suggested definitions of IC exhibit a remarkable level of metaphorical similarity with each other. Based on the literature, the term "intangible capital" (IC) refers to all an organization's intangible resources that make it possible for the organization to create value and gain a competitive advantage. With regard to the increased environmental awareness among the stakeholders (Chang & Chen, 2012), strategy scholars reveal that the intellectual capital perspective fails to acknowledge the relationship between a firm and its natural environment (Jirakraisiri, Badir, & Frank, 2021). Yong et al., (2019) state that the Brundtland Report of 1987 mandated that companies operating in a highly competitive global marketplace must embrace environmentally responsible practices to improve their competitiveness and sustainability. According to Chang & Chen, (2012) possessing environmental knowledge is a prerequisite for the development of sustainable intellectual capital. The GIC framework is the same as the IC framework. The IC approach considers sustainability as one of multiple intangible assets, but the GIC approach sees it as the emphasis and a catalyst for knowledge generation and management (Alvino, Di Vaio, Hassan, & Palladino, 2021).

The GIC concept allows for the incorporation of environmental considerations into overall organizational management. Huang & Kung, (2011) argue that GIC makes a difference in organizations that have chosen to be focused on sustainability. This is because environmental awareness alone cannot assure sustainability and effective environmental management necessitates the use of both tacit and explicit knowledge. GIC helps organizations that have chosen to prioritize sustainability to succeed. GIC can ensure alignment between an organization's strategic decisions, operational side, culture and values, and its intangible assets and capacity to generate innovation (Chang & Chen, 2012; Chen, 2008; Russo & Fouts, 1997). Since GIC focuses primarily on non-economic objectives, it encourages long-term sustainable thinking within the company Benevene et al., 2021). It is crucial to underline the importance of this element since it is difficult for a company's green management to boost profitability in the short term, which discourages both management and stakeholders from taking more actions toward sustainability (Chen, 2011). This research will use three components to explain GIC: green human capital (GHC), green structural capital (GSC), and green relational capital (GRC) (Chen, 2008).

Green Human Capital: Human capital is widely acknowledged as a crucial resource for the attainment of organizational success, owing to the indispensable role played by employees in ensuring the survival and prosperity of businesses within the contemporary, rapidly evolving business environment (Shah, Ahmed, Ismail, & Mozammel, 2021). According to the theoretical framework of the Resource-Based View (RBV), an organization's enduring competitive advantage is primarily contingent upon the intrinsic nature of its internal resources and capabilities. Research by Nejati, Rabiei, & Chiappetta Jabbour, (2017) in Agyabeng-Mensah & Tang (2021) the knowledge, skills, and abilities of employees are essential for the successful implementation of sustainable practices and serve as a competitive advantage. In light of the necessity for businesses to cultivate green innovation and green management in response to external environmental pressures, Chen (2008) introduces the groundbreaking idea of "green human capital."

This concept incorporates, among other things, the integration of employees' environmental knowledge, skills, abilities, experience, attitude, wisdom, creativity, and commitments regarding environmental protection or green innovation (Chang & Chen, 2012). Green human capital (GHC) encompasses the intellectual capital of individual employees that is aligned with environmentally conscious practices (Chang & Chen, 2012). This form of capital has the potential to ease the transfer of information among firms in an efficient manner (Chang & Chen, 2012). Businesses with high GHC may provide their staff with the necessary green skills and competencies, enabling them to make good and meaningful contributions to environmental protection, decision-making, and problem-solving (Jirakraisiri et al., 2021). While recognizing the significance of human capital in attaining sustainability, limited scholarly investigations have been conducted to explore the correlation between greenhouse gas emissions (GHC) and business sustainability (BS).

Green Structural Capital: According to Chen (2008), Green Structural Capital (GSC) can be defined as an accumulation of various elements within an organization that encompass its organizational capabilities,

commitments, knowledge management systems, managerial philosophies, organizational culture, company images, patents, copyrights, and trademarks. These components are intrinsically linked to the pursuit of environmental protection or the advancement of green innovation within the organizational context. GSC comprises a variety of hierarchical assets that are required for efficient environmental protection. Organizational capabilities, information management systems, executive decision-making tools, incentive structures, legal licenses and trademarks, administrative components, educational technology infrastructure, organizational culture, brand reputation, copyright protection, and databases are examples of these assets (Ali et al., 2021). Organizations endowed with strong structural capital find themselves in a setting that fosters employees' inherent desire for continuous knowledge acquisition, hence improving the company's overall capabilities (Shah et al., 2021).

In addition, the lack of GSC will have a negative impact on the company's performance because it hinders the implementation of environmentally sustainable practices. In broader terms, GIC management must establish an organizational culture that is capable of producing and accumulating knowledge pertaining to environmentally sustainable practices (Benevene et al., 2021). Previous research has demonstrated that the presence of green structural capital has a beneficial influence on performance outcomes. For example, a study conducted by Chen (2008) and Firmansyah (2017) revealed that there's a relationship between green structural capital (GSC) and competitive advantage. Yong et al. (2019) reported that GSC has a positive impact on the sustainability of businesses. A further study conducted by Huang and Kung (2011) also discovered that GSC has a favorable impact on environmental competence and actions associated with commitment. Although there's evidence that GSC has positively impacted many organization outcomes, very few researchers have tried to investigate the relationship between GHC and business sustainability (BS).

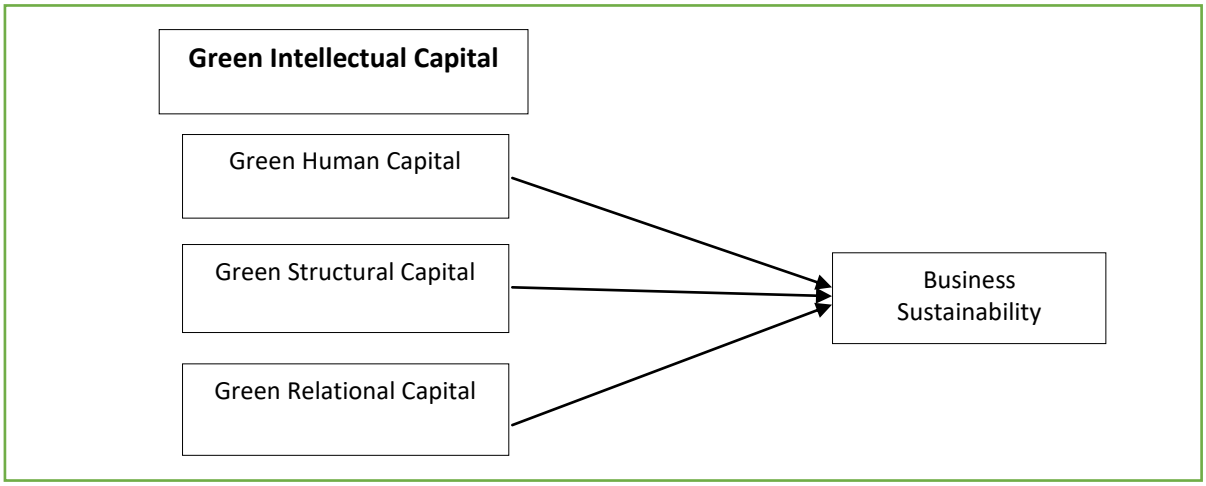
Green Relational Capital: GRC refers to a company's interactions with key stakeholders in the corporate environment management process, as well as its utilization of green innovation to generate wealth and gain competitive advantage (Ullah et al., 2021). GRC is characterized as a type of knowledge obtained from the formation and management of stakeholder relationships. It consists of connections with institutions, suppliers, customers, partners, and other members of networks for green innovation and environmental management, all of which have led to long-term operations. These organizations have enabled sustained operational actions over a long period of time (Chen, 2008; Yong et al., 2019; Yusliza et al., 2020). These relationships are founded on trust developed between partners through previous interactions (Baycan & Öner, 2022). According to Welbourne (2008), GRC has emerged as a vital strategic asset that enables an organization to effectively develop a strong market position.

According to one study (Sadiq et al., 2022; Yong et al., 2019; Yusliza et al., 2020), a hospitality firm can generate and improve green products and services by integrating green knowledge and skills of employees with green resources derived from network relationships (i.e., green relational capital). Therefore, when a hospitality organization embraces a strategy approach that prioritizes green innovation, it has the potential to acquire green relational capital through its network connections (Wang, 2022). According to Yu and Huo (2019), GRC practices have a notable influence on the business performance of companies operating within the manufacturing industry. This approach enables the organization to prioritize sustainable product development and implement green production practices. Through the use of environmental sustainability practices, the organization is able to enhance its business performance (Yusliza et al., 2020). Despite the existence of empirical evidence indicating a positive influence of GRC on many organizational outcomes, there remains a dearth of research particularly investigating the association between GRC and business sustainability (BS).

4. Proposed Framework and Conclusion

This research aimed to establish a link between the aforementioned theories to conceptualize the intangible assets that contribute to corporate sustainability. The term "green intellectual capital" was created by integrating the concept of "green" with the traditional concept of intellectual capital. Based on the review of the literature, the proposed model is depicted in Figure 1.

Figure 1: Conceptual Framework on the Relationship between GIC and Business Sustainability



It can be concluded that, in ensuring the sustainability of businesses, priority should be focusing on the skills, expertise, commitments, organizational structure and the growing expectations and relations from stakeholders. This study highlighted various literature and revealed the components of Green Intellectual Capital (GIC) and its positive effects on business sustainability. Understanding the effects of GIC on business sustainability is critical for generating a competitive edge for the organization's future through Green Human Capital (GHC), Green Structural Capital (GSC), and Green Relational Capital (GRC). Organizations will be able to uncover new sources of competitive advantage to sustain their business by focusing on the implications of GIC components in various business operations.

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