

## Green intellectual capital as a source of sustainable competitive advantage

رأس المال الفكري الأخضر كمصدر للميزة التنافسية المستدامة

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### Abstract:

The interest of the environmental aspect has changed the patterns of competition around the world

The green concept has evolved as a policy in many businesses, on this basis green intellectual capital initiatives have emerged as a new strategy in developing the company that is based on eco-friendly and the main resource for creating value and achieving sustainable competitive advantage.

The purpose of this article is to explore the Role of green intellectual capital and its components (green human capital, green structural capital, green relational capital) on sustainable competitive advantage, And the most important results reached in this area.

**Keywords:** Green intellectual capital, Green human capital, Green structural capital, Green relational capital, Sustainable competitive advantage.

**Jel Classification Codes:** O34, J24, M21,D41,Q56.

### ملخص :

لقد غير الاهتمام بالجانب البيئي أنماط المنافسة حول العالم، فقد تطور المفهوم الأخضر كسياسة في العديد من الشركات، وعلى هذا

الأساس ظهرت مبادرات رأس المال الفكري الأخضر كاستراتيجية جديدة في تطوير الشركة التي تقوم على أساس صديق للبيئة والمورد الرئيسي لخلق القيمة وتحقيق ميزة تنافسية مستدامة.

الغرض من هذه المقالة هو اكتشاف دور رأس المال الفكري الأخضر ومكوناته (رأس المال البشري الأخضر، رأس المال الهيكلي الأخضر، رأس المال العلائقي الأخضر) في تحقيق ميزة تنافسية مستدامة، وكذا إبراز أهم النتائج التي تم التوصل إليها في هذا المجال.

**الكلمات المفتاحية:** رأس المال الفكري الأخضر، رأس المال البشري الأخضر، رأس المال الهيكلي الأخضر، رأس المال العلائقي الأخضر، الميزة التنافسية المستدامة.

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## 1. Introduction

The natural environment become major challenge in th achievement of competitive advantage. Where competitive advantage strategies are depened highly , in the present and in the future on the resources and capabilities that ease activity of environmental friendly.

The natural resource based view (NRBV) postulate that a basis for a competitive advantage of a firm lies primarily in the application of bundle of valuable, rare, inimitable resources and socially complex organisational process that facilitate environmentally sustainable economic .

The intellectual capital resources are considered as valuable drivers of corporate performance and competitive advantage due to their specific criteria's such as intangible, valuable, rare and inimitable resources Thus, the green intellectual capital theory explain that the interaction of each sub-dimension : green human capital ,green organizational capital and green relational capital as strategic resources drive firms into sustainable competitive advantage.

### 1.1. Research problem :

Based on the above, the problem of our study can be formulated as follows:

**What is the green intellectual capital and what is his role and his relationship with sustainable competitive advantage?**

### 1.2. Research hypotheses:

To answer this problem, the following hypothesis can be formulated:

**Main hypothesis (H):** The green intellectual capital (Green Human Capital, Green structural Capital, Green relational Capital) has a positive role in achieving sustainable competitive advantage.

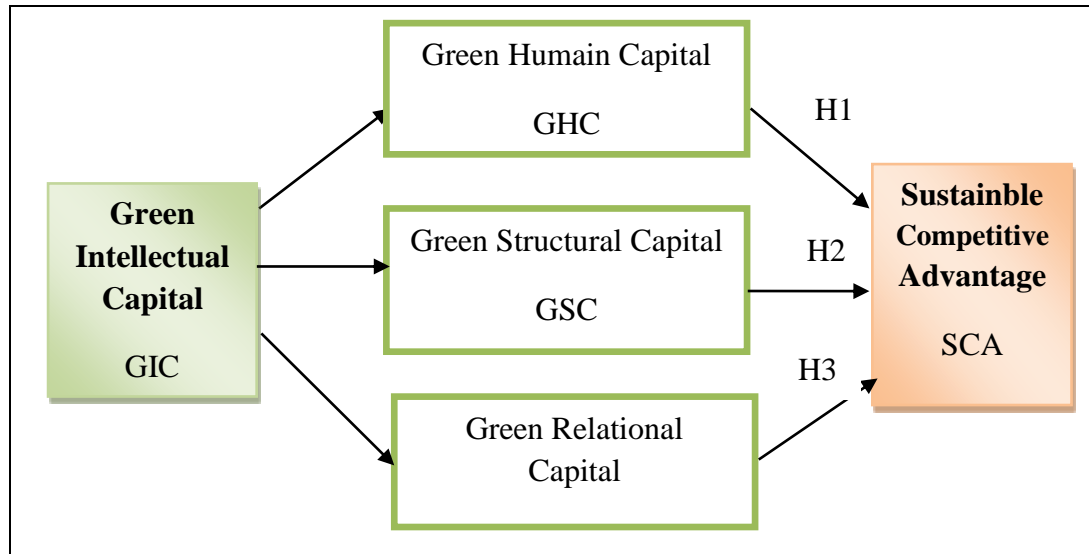
Included within the following sub-hypotheses:

**hypothesis1 (H1):** Green Human Capital has a positive role in achieving sustainable competitive advantage.

**hypothesis2 (H2):** Green structural Capital has a positive role in achieving sustainable competitive advantage.

**hypothesis3 (H3):** Green relational Capital has a positive role in achieving sustainable competitive advantage.

The following figure shows the study model:



Source : prepared by the two researchers based on previous studies.

**Fig(1) :** The conceptual framework of the study

### 1.3. Research objective :

We aim through this research to:

- Identify the concept of green intellectual capital and its various components
- Identify concept of competitive advantage and, in particular, the sustainable competitive advantage.
- Showing the importance and the role of green intellectual capital and its various components in achieving sustainable competitive advantage.

## 1. Main text

### 2.1. Intellectual Capital Definition :

Intellectual capital is defined as a form of accumulation of tangible assets, knowledge, capabilities, and relationships at employee and organizational level in a company, and it is usually grouped into three dimensions: human capital, structural capital, and relational capital. (Budhi Cahyono, Abdul Hakim, 2019, p79)

Intellectual capital is set of knowledge, information, intellectual property, experience, competition and organizational learning that can be used for create wealth. Indeed, intellectual capital is includes all employees, organizational knowledge, their abilities for establish added value. (Mehdi Fadaei and all, 2013, p55)

Edvinsson See that it includes intangible resources (assets) that can be used by the organization to create value by converting it into new processes, goods and services, so the intellectual capital is the knowledge, experience and strength of workers, Knowledge resources stored in the organization's information base, operations, culture and philosophyas. (Edvinsson, 1997, p146)

## 2.2. Classification of Intellectual Capital:

The literature presents a great number of classification for intellectual capital. However, a convergent taxonomy emerged, categorizing intellectual capital onto three components: human capital; structural capital and relational capital:

### 2.2.1. Human capital:

Human capital is a main component of intellectual capital because employees generate IC through their competence, their attitude and their intellectual agility, competence includes skills and education, while attitude covers the behavioral component of the employees work. Intellectual agility enables one to change practices and to think of innovative solutions to problems.

Human capital has been defined on an individual level as: "the combination of four factors: genetic inheritance; education; experience; and attitudes about life and business." (Madiha Bakhouché, 2019, p 13)

Human capital is a mixture of employee's attitude, competence and creativity and. Employees' competence includes: skills, experiences and talents, employees' attitude includes motivation and satisfaction. Employees' competence refers to the employees' learning ability, qualities of employees and strategic leadership. On the other hand, employees' attitude might be identified by corporate value, employees' turnover rate, and the degree of employees' satisfaction. Employees' creativity allows them to use their knowledge in flexible way and to make innovations constantly. Employees' creativity indicators could be: employee's creative ability and their ability to create new ideas. (Ikhlas Altarawneh, 2017, p40)

### 2.2.2. Structural capital (organizational):

Structural capital includes the systems, networks, policies, distribution channels, Information Flow and Elements of Databases, Leadership and Management Style, Organizational Culture and other "organizational capabilities" developed to meet market requirements as well as intellectual property business routines, organizational structure, informational systems, organizational learning, and operational processes. (Madiha Bakhouché, 2019, p 13), (Mehdi Fadaei and all, 2013, p56)

Corporate culture is the way company act in term of values, beliefs, faith and behavior shared by all the staff. Organizational structure includes both formal and informal organizational relationship which consists of the power relationship, authority and responsibility positions and the control system. Organizational learning is the result of the regular learning, accumulating knowledge, and coping with changes. Finally, information system includes the repository, disposal and communication methods for the internal information of a company. (Ikhlas Altarawneh, 2017, p41)

### 2.2.3. Relational capital (customer):

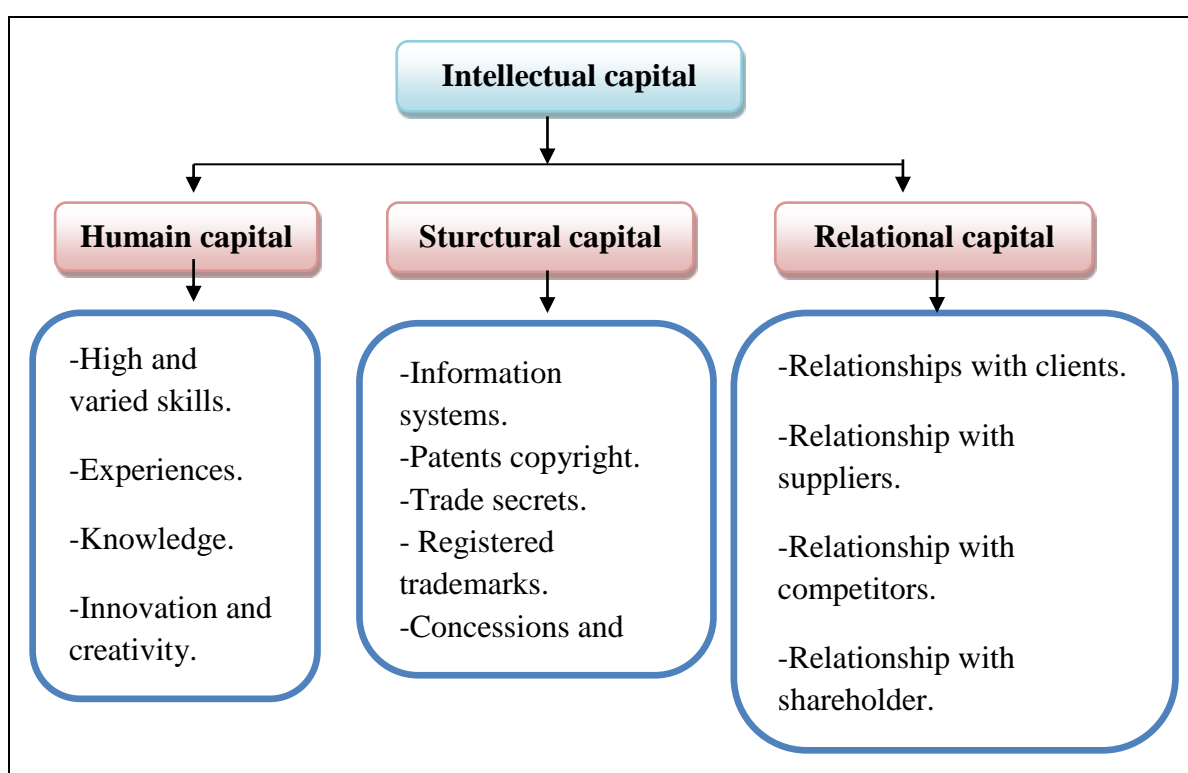
Mazlan defined it as All relationships between the organization and its stakeholders, such as client, suppliers, Competitors ,shareholder ,government .Strategic alliance. (Mazlan, 2005, p 09)

This includes the connections that people outside the organization have with it, their loyalty, the market share, the level of back orders, and similar issues. (Madiha Bakhouché, 2019, p 13)

customer capital can be categorized into: the basic abilities of marketing; customer loyalty; and the intensity of market. The basic ability of marketing helps organization to increase its market strength, customer's loyalty and competitiveness.

Market intensity refers to the current status of market and its potential. While, customer's loyalty that can be building up through customer satisfaction. (Ikhlas Altarawneh, 2017, p41)

The following figure is shown The components of intellectual capital:



Source: Adapted by the two researchers, depending on:

(هاني محمد السعيد، 2008، ص37)

**Fig(2) :** Components of intellectual capital

### 2.3. Green Intellectual Capital :

Green intellectual capital is defined as the “sum of knowledge to leverage the process of conducting environmental management to get a competitive advantage”.it has three dimensions or attributes the first is green human capital, the second green relational capital and the third green structural capital. (López-Gamero et al. 2011,P21)

The green intellectual capital define as the total amount of all intangible asset owned by company, knowledge, capability, and relations regarding environmental protection and green innovation both on individual and also organizational level of a company.

Green intellectual capital allows company to obey the strict international environmental rule and to increase the customers’ environmental awareness, and also to create company’s value.

the green intellectual capital is categorize into green human capital, green structural capital, and green relational capital. (Arie Susandya et al, 2019, p229)

#### 2.3.1.Green human capital :

Green human capital means assets of employees such as knowledge, skills, commitments, and creativity toward environmental protection.(Saqib Yaqoob Malik et al, 2020, p7)

green human capital is defined as the employees’ knowledge, expertise, capability, experience, attitude, wisdom, creativity, and commitment on environmental protection and green innovation.(Arie Susandya et al, 2019, p230)

#### 2.3.2..Green structural capital :

Non-human assets or intangible organization assets are called green structural capital .Green structural capital is defined as “assets showing environmental concern and green innovation such as organizational culture, capabilities, rewards system, information and knowledge management system, trademarks... etc.”.(Chen ,2008, p272)

green structural capital is defined as an organizational capability, organizational commitment, knowledge management system, managerial philosophy, organization culture, company’s image, patent, copyright, and trademark on environmental protection and green innovation in a company.(Arie Susandya et al, 2019, p230)

#### 2.3.3.Green relational capital :

Chen (2008) defined green relational capital as “intangible assets of the company that are based on the relationship between organization and supplier, customers, green innovation, network members, and partners about corporate environmental management with the aim to obtain competitive advantages” (Chen, 2008, p278)

The relationship between customers and firms is very important. Previously, the focus was given to the product, pricing and packaging, but now customers are also interested in the environmental behavior of firms (Saqib Yaqoob Malik et al, 2020, p8)

### 2.4.Competitive Advantage definition :

A competitive advantage is: "an advantage gained over competitors by offering customers greater value (by lower prices or providing additional benefits and service that justify similar, or possibly higher prices).(Madiha Bakhouché, 2019,p14) Porter see that the competitive advantage arises from the value that the organization can create for its customers, through Low price, or offering distinct benefits in the product compared to the competitors. ( Porter, 2000, p8)

Competitive advantage Represent the situation in which the institution is in a better position compared to competitors due to its possession of certain competencies, resulting in the organization's possession of success factors related to the activity sector .( Strategor, 2001, P529 )

Competitive advantage refers to the quality of the company where an organization utilizes its expertise, competency, and resource efficiently that cannot be imitated by the competitors.(Barney, 1991, p102)

A firm is said to have a competitive advantage when it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitors. A firm is said to have a sustained competitive advantage when it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitors and when these other firms are unable to duplicate the benefits of this strategy.(Barney, 1991, p102)

The study of Hoffman et al refers to Prahalad and Hammel's observation about the core competency becoming a distinctive core competency -meaning that the firm differentiates from its competitors, not only when that company does that something very well (a core competency) but when the company does that something better than anyone else in the industry (a distinctive core competency) .This competency then becomes a competitive resource, and if barriers exist that limit other firms' access to the resource, it becomes a long-term source. (Hoffman et al, 2006 , p 140)

There are two basic types of competitive advantage: cost leadership and differentiation'. Among these two types of competitive advantage the factors that may lead to reach it are; sustained revenue, innovation and new product development/first to market, brand and reputation, advertising, media coverage, customer needs, customer service/satisfaction, employee relations, acquisitions and mergers, regulatory issues, political correctness, IT services that affect customer service. (Freeman, 2001, p 39)

## **2.5.Competitive Advantage Strategies and Sources:** (Ikhlas Altarawneh, 2017, p42)

Competitive advantage is built from different generic strategies such as: cost leadership, differentiation and focus strategies. Within the cost leadership strategy, an organization seeks to secure a cost advantage among its competitors by reducing its overall costs in order to be able to provide its products and services within a competitive lower price and relative to products and services' quality received by the customer and, at the same time, achieve a high profit margin.

This strategy requires different managerial practices; using new technology to increase the efficiency and accuracy of doing work; devising more efficient work methods so that

an organization could eliminate the waste of time, also increasing the workers' competencies and maintaining competitive workforce.

Differentiation strategy it is achieved by serving customers' needs differently, ideally and uniquely. Differentiation strategy involves cost increasing, which is recouped if the customers are willing to pay the necessary premium price. Organizations could differentiate in different ways:

creating high quality products and services, introducing innovative or creative products and services, having a superior location preferred by customers, promoting or packaging products and services, or, by creating strong relationships with customers and unique customer services management..

Focus strategy, is where a company chooses to concentrate on only one segment or a limited range of segments. Focus strategy combined with the other two competitive strategies, or either lower cost or differentiation. Cost focus is a low-cost competitive strategy that focuses on a particular customer group or geographical market and attempts to serve only that niche, to the exclusion of others. Differentiation focus, concentrate on a particular customer group, product line segment, or geographical market.

## 2.6. Competitive Advantage Dimensions:

Many studies have addressed the competitive dimensions and priorities which can help firms gain and sustain CA. we are mentioning it at below:

(Abu-Moghli et al., 2012,pp3-4), ( Ikhlas Altarawneh, 2017, p43).

- **Quality:** Quality is one of the crucial competitive factors in the marketplace, CA is created through quality by providing products or services that meet or exceed customer expectations and needs.

quality is described as "Fitness for use" where fitness is about the goods and services that satisfy the customers' needs.

in order to achieve quality, organization should add distinctive features and attributes to product or services to enhance their competitive position and add value to customers.

There are eight dimensions for quality to be achieved namely: performance; features; reliability; conformance; durability; serviceability; aesthetics and perceived quality.

Porter, (1985) say that firms which compete on quality can adopt a differentiation strategy and position their products based on several attributes to satisfy customer needs which might lead to the ability of charging premium price.

- **Cost:** Cost is the ability to manage efficiently all the operation involved, including all the related aspect such as overhead cost and added value cost without hearting the quality of the product or service. Cost can be fixed or variable, direct or indirect, and long or short-term. In addition, the cost can be expressed by its objectives.

there are three types of costs for quality: appraisal costs, failure costs and prevention costs. companies should take in their account the cooperation between cost and uniqueness of their products and services. Organizations must reduce costs without hurting the quality of the products or services. Generally most of organizations choose to reduce costs in many



different ways such as: reducing employee compensation rates, using backward or forward integrations strategies, tightening fixed costs, controlling the raw materials and use either just-in-time or mass production method.

Porter, say that CA can be achieved by adopting the strategy of cost leadership. There are three features for this strategy: economies of scale, standardized related products and low cost comparing to competitors. CA can be divided into: lower cost that ends up with low price comparing with competitors, and the ability to innovate and differentiate products or service to end up with premium price that exceeds the extra cost of doing so

• **Flexibility:** Flexibility can be defined as the ability of the processes to switch from one product to another or from one customer to another at the least cost or impact. The literature classifies flexibility into different dimensions:

Upton (1994) classifies flexibility into two forms: action flexibility and state flexibility. Action flexibility is the capacity for taking new action to meet new circumstances, while state flexibility is the capacity to continue functioning effectively despite changes in the environment.

According to (Das, 2001) flexibility can be classified into three categories: volume flexibility (the ability of a manufacturing system to vary total production volume economically); Market flexibility (the ability to adapt to a changing market environment easily); and new product flexibility (the ability of a manufacturing system to introduce and manufacture new parts and products

Zhang (2003) categorize flexibility into: (1) mix flexibility (the ability of a company to produce different mix of products efficiently and effectively) and (2) labor flexibility (the ability of the workforce to do a broad range of manufacturing tasks efficiently and effectively). Flexibility also includes product flexibility which is defined as the company's ability to change the design of the product according to the changes in the customer's needs and tastes. The second flexibility is about the respond to the volume of demand. This flexibility may lead to the introduction of new product, the diversity of the products and on-time delivery

## 2.7. Viewpoints about Sustainable Competitive Advantage :

The World Commission on Environment and Development (WCED) has defined sustainability as "development that meets the needs of the present without affecting future generation's needs". Besides, a triple bottom line principle; it has three dimensions natural environment, economic and social performance. (Saqib Yaqoob Malik et al, 2020, p3)

The concept of sustainable competitive advantage (SCA) was introduced in 1984 when Day was explaining the competitive advantage maintenance strategies. The term sustainable competitive advantage was seriously developed in 1985 by Porter and in terms of a variety of competitive strategies (cost leadership, differentiation, and focus) to achieve long-term competitive advantage. (Mohammad Hakkak, Masoud Ghodsi, 2015, p300)

Sustainability does not refer to a particular period of calendar time, nor does it imply that advantages persist indefinitely but rather depends on the possibility and extent of competitive duplication. "It starts with the assumption that the desired outcome of

managerial effort within the firm is a sustainable competitive advantage”.(Gowrie Vinayan and al, 2012, p30)

Sustainable Competitive advantage can be obtained when a firm develops a distinctive core competency. (Hoffman et al,2006, p140)

The literature indicates that competitive advantage increasingly is achieved by those firms that succeed in mobilising their intangible assets in the form of knowledge, technological skills, experience, and strategic capabilities toward creating new process and product or service offerings. (Tovstiga and Tulugurova,2007, p697)

Hence the successful mobilization of these intangible assets may be identified as a distinctive core competency for the organization.

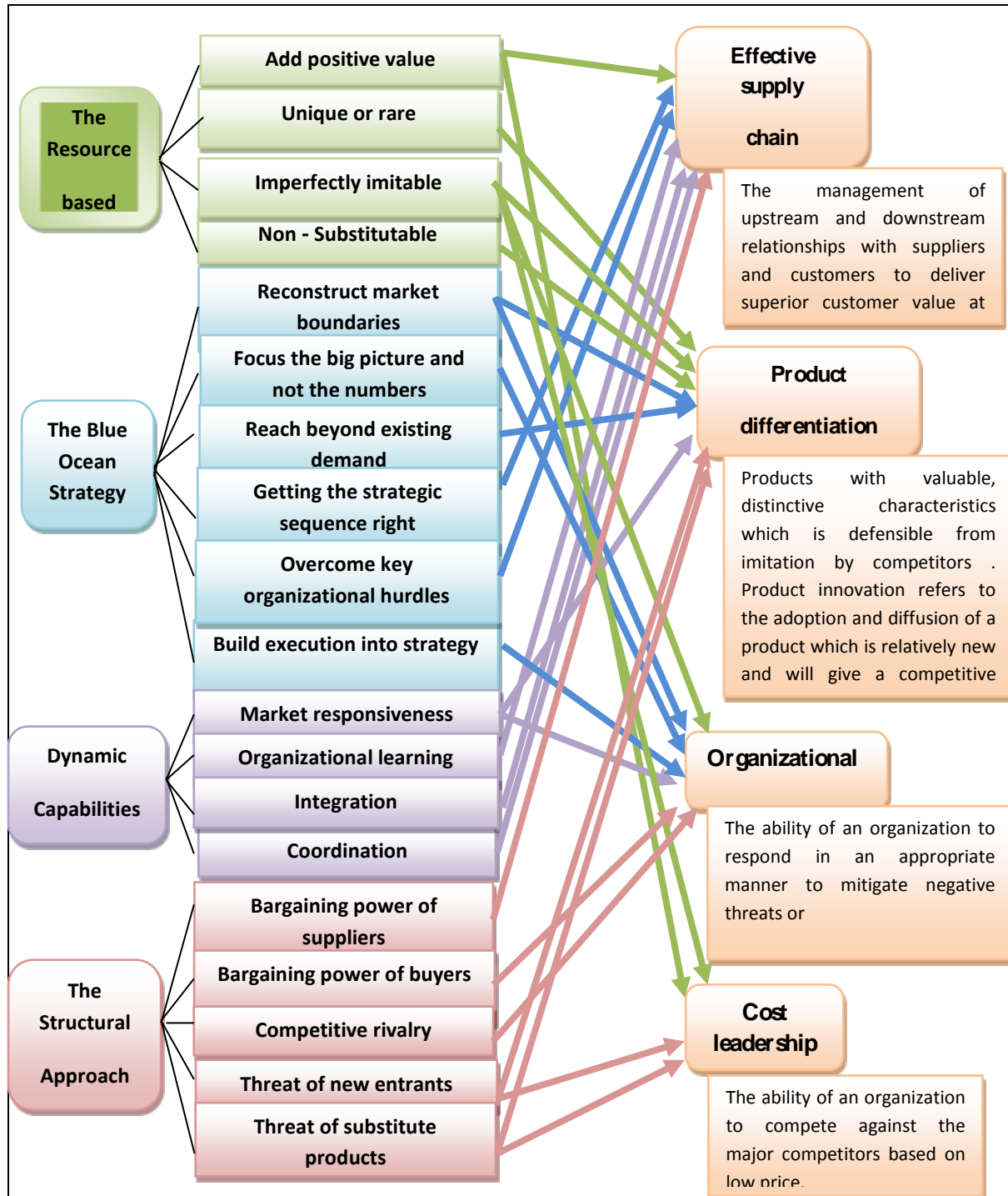
The most common theory that examines competitive advantage of the firms, is resource based theory. We know from (Schumpeter, 1934) that resources can be important sources of innovation through new or different combinations of new or already existing resources and through their superior abilities. (Hoffman et al., 2006, p 140)

Laurence Prusak in an article published in 1996 stated the following: “Researchers in the areas of sustainable competitive advantages have come to the conclusion that the only thing that gives an organization a competitive edge, the only thing that is sustainable, is what it knows, how it uses what it knows, and how fast it can know something new.(Madiha Bakhouché, 2019, p14)

To obtain a sustainable competitive advantage, organizations should place more importance on the internal factors rather than the external environmental conditions. The external conditions can only be controlled up to a point and even sometimes they cannot be controlled at all. On the other hand the internal resources, internal assets of the organizations are under the governance of organization itself. Accordingly the main vision of the organizations should be on the efforts to influence the internal organizational factors.

## **2.8.Operationalization of Sustainable Competitive Advantage :**

The following figure explains the Operationalization of Sustainable Competitive Advantage :



Source: Gowrie Vinayan and al, 2012, p32.

Fig(3) : Operationalization of Sustainable Competitive Advantage

## **2.9.The relation between Green intellectual Capital and Sustainable Competitive Advantage:**

Sustainability does not mean only in financial terms, such as return on assets, equity, earning per share, investment, but taking an interest in the environment and social wellbeing of employees, customers, societies, employees and all stakeholders. That is why organizations are now becoming people-oriented with green activities as a priority. Therefore, sustainability also means introducing and developing solutions to solve the problems of societies and environments. (Saqib Yaqoob Malik et al, 2020, p3) Most of the previous studies found the positive effect between green intellectual capital and sustainable competitive advantage. The result suggests that the three components of green intellectual capital, those are green human capital, green structural capital and green relational capital, had positive effect on sustainable competitive advantage.

### **2.9.1.The relation between Green humain Capital and Sustainable Competitive Advantage:**

Most of the previous studies confirmed the positive impact and contribution of Green humain Capital to achieving sustainable competitive advantage, the employees' knowledge, expertise, capability, experience, attitude, wisdom, creativity, and commitment, etc. on environmental protection and green innovation would help the company to gain its competitive advantage. (Arie Susandya et al, 2019, p230)

The company that invested its human resource and developed its green green intellectual capital is not only able to obey the strict international environmental rule and accomplished the enhancement of costumer's ecological awareness but also eventually gained the sustainable competitive advantage. ( Arie Susandya et al, 2019, p229)

green abilities might be developed through training activities. Hence, human capital helps organizations to recognize their intangible assets and implement green activities. The company's focus on human capital will lead to green organizations because more knowledge and awareness about environmental problems possessed by employees made them competitive. (Saqib Yaqoob Malik et al, 2020, p7)

### **2.9.2The relation between Green structural Capital and Sustainable Competitive Advantage:**

Many studies confirmed the positive impact and contribution of Green structural Capital to achieving sustainable competitive advantage. Green structural capital is the existing organizational capabilities, organizational commitments, knowledge management systems, reward systems, information technology systems, databases, management mechanisms, operational processes, management philosophies, organizational culture, company's mental images, inventions, copy right and trade mark and ... related to the environmental protection or green innovation inside the company.(Fahimeh B,Nivlouei Esmaeil

D,2014,p51)

The company must be able to satisfy the routine processes and structures of the company that support the efforts of the employees. It produces optimum intellectual performance, general business performance and all forms of company-owned intellectual property. A strong organizational structure makes the company more valuable compared to competitors. Good structural capital makes the company competitive and has more value thanks to its ability to produce efficient and effective outputs, which contribute to achieving sustainable competitive advantages. (Arie Susandya et al, 2019,p236) .

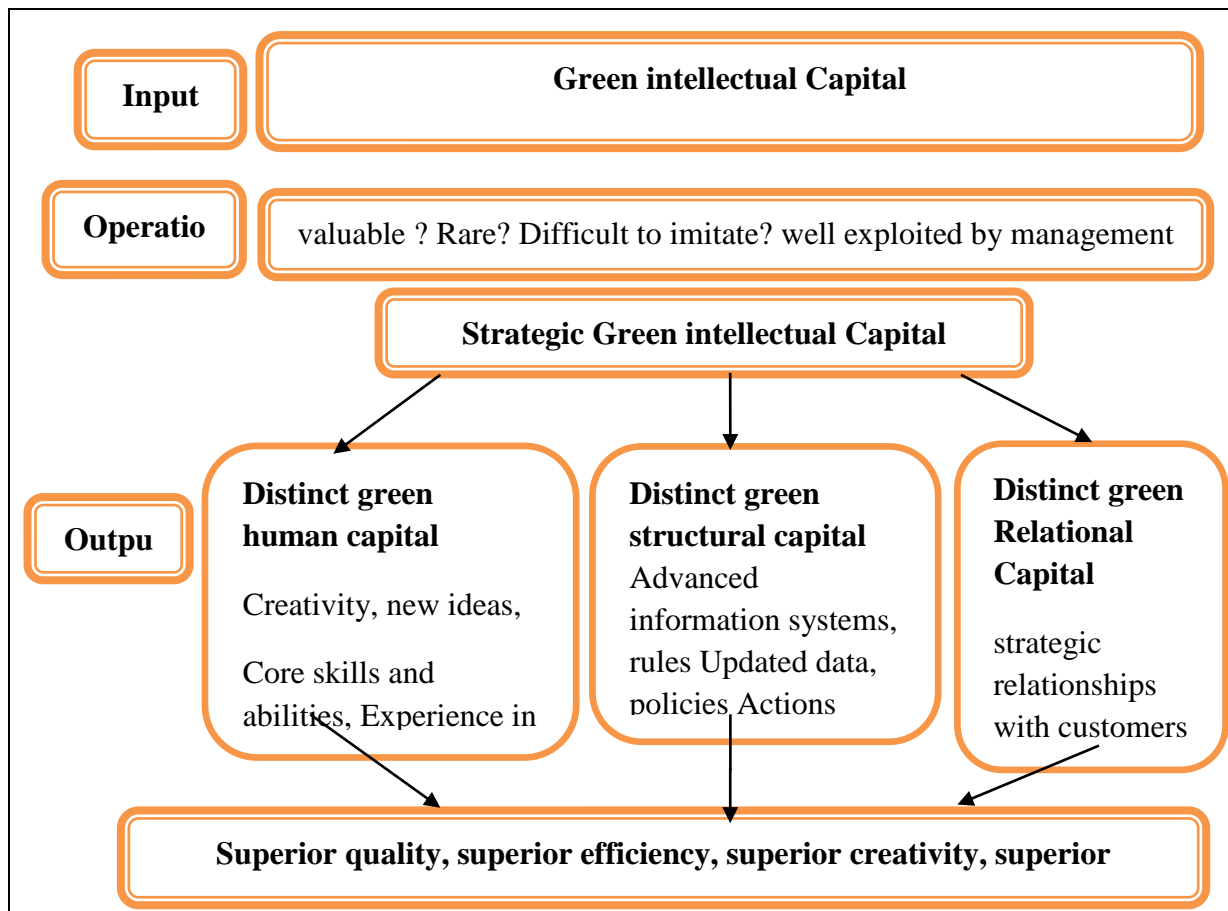
### **2.9.3The relation between Green relational Capital and Sustainable Competitive Advantage:**

Most of the previous studies confirmed the positive impact and contribution of Green relational Capital to achieving sustainable competitive advantage, green relational capital included company's interactive relation with the customers, distributors, members of network, and partners on environmental protection and green. (Arie Susandya et al, 2019, p230)

Now firms are shifting their concerns to be customer-oriented rather than product-oriented, due to green relational capital. Besides, relational capital is the idea of association among customers and stakeholders, and the exchange of knowledge and information is crucial between two parties for long term relationships. Firms face pressure from stakeholders and stakeholders always have queries, and green supply chain management should address their concerns.(Saqib Yaqoob Malik et al, 2020, p8)

Longoni and Cagliano (2018) asserted that stakeholders answers could be addressed through green supply chain management, and other studies also affirmed that relationship between supply chains and environmental perspective was a significant tool. Hence, the strength of the relationship between suppliers and organizations plays a significant role in green relational capital for sustainable competitive advantage. A second important relationship is that with customers, which has arisen in recent years. The expectations of customers have begun to be focused on sustainable environmental behaviors rather than being limited only to product, price or service. In this regard, organizations need to maintain their relationship with their customers to have a sustainable competitive advantage.(Yusliza, 2019, p12)

The following figure explains the role and the relationship between Green intellectual Capital and Sustainable Competitive Advantage:



Source: Adapted by the two researchers, depending on:

(فرحاتي لويذة، 2016، ص ص 226-227)

**Fig(4 ):**The role and the relationship between Green intellectual Capital and Sustainable Competitive Advantage

## 2.Conclusion

Through the above, the following results can be concluded:

- There is no standard definition for intellectual capital but we can said that is a combination of human, structural and relational capital. .
- competitive advantage is a strategic goal of any corporation to gain benefits and survive in business environment.
- Competitive success now is based less on the strategic allocation of physical and financial resources, and more on the intellectual capital.
- in knowledge economy intellectual capital is the source of sustained competitive advantage and an important factor in value creation.
- the challenge now is not how to gain competitive advantage , but the challenge is to sustain , sustainability of competitive advantage Through intellectual capital rather than physical and finance assets Therefore, companies have to manage their intangible assets effectively. The ability to leverage and develop intangible assets, particularly those

providing financial and professional services, creates a core competency to organizations in order to achieve sustainable competitive advantage

- The interest of the environmental aspect has led to the emergence of green capital initiatives as an environmentally friendly strategy that creates value and leads to a sustainable competitive
- The relationship between green intellectual capital and competitive advantage is similar to the system, its inputs are its components represented in ( green human capital, green structural capital and green relational capital), while the treatment is the application of the principle of value, scarcity, difficulty of imitation, optimal exploitation, and the outputs are the organization's possession of a distinct strategic intellectual capital, with its distinct components that enable The organization from achieving the sustainable competitive advantage of superior quality, superior creativity, superior efficiency and superior response
- Finally, through all that has been presented and through most of the previous studies, it can be said there is a positive effect between green intellectual capital and And its components green human capital, green structural capital and green relational capital on sustainable competitive advantage.

This finding emphasizes the necessity to display and benefit from international experiences of leading companies that have invested in intellectual capital as a mechanism to obtain and sustain its competitive advantage.

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