The Influence of Intellectual Capital on Organizational Productivity: Literature Review

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Abstract

This paper aims to examine how aspects of Intellectual Capital influence the productivity in organizations. The Intellectual Capital involves concepts of human resources, qualifying, knowledge transferring, knowledge complexity, intrapreneurship, entrepreneurship, start-ups, innovative capability and their interrelationships selectively influencing Organizational Strategies. The research is applied and has qualitative nature, with methodology of research based on exploratory bibliography techniques, looking forward to build a cyclical interdependence for following constructs: “Intellectual Capital”, “Organizational Strategy”, “Organizational Productivity” and “Competitive Advantage”. Anticipating, intellectual capital might influence the organizational productivity on both ways positively and negatively, therefore consists itself in a significant concern to be considered by organizational strategy analysis. This study focus on the importance of knowledge and its implications for obtaining competitive advantages and enforcing organizations dynamics, supporting the processes of reflection, awareness and maturity of managers, students, academics and others stakeholders.

Keywords
Intellectual Capital, Organizational Strategy, Organizational Productivity and Competitive Advantage

1. Introduction

1.1 Context

In recent decades, the international business scenario has evolved noticeably. The old organizational model, based on Tailor’s measurement and improvement of task execution, has been losing ground because it does not add the required value to the organization; neither distinguishes an organization on the business competition. Porter [1] analyzes the rivalry between competitors within this competitive universe, an issue that has led other authors to explore the subject [2-4]. Such power requires from an organization the capability of formulating an organizational strategic planning, covering an analysis of the available tools and opportunities for improvement outputs.

In this scenario, knowledge management increasingly assumes a central role and gains focus as a tool capable of providing the increased productivity of an organization. In this way implies a representative competitive advantage. The study of knowledge management gained momentum since the 90s, through different theoretical approaches related to organizational learning and knowledge as well as to highlight the main asset of an organization, whom authors such as Drucker, Stewart, Davenport, and Sveiby may be cited.

Knowledge means applying a set of rules, procedures and relationships to a set of data so that it achieves informational value [5]. This value, in turn, is exploited and converted to an organizational asset, so it impacts on productivity, and deserves approach from the perspective of organizational strategy. According to Drucker [6], large productivity gains will bring the management of knowledge, i.e., the reduction of costs or maximization of production of goods or services. It shall be the result not only of “how much” but also the “how” activities are performed and shared. When it happens the development of knowledge becomes the key for optimizing productivity in an organization.
1.2 Problem for researching
Facing a competitive international environment between organizations, characterized by growing rivalry between the companies, this paper aims to analyze the influence of intellectual capital on organizational performance results in order to generate competitive advantage for the organization. Besides the central research problem, seeks to analyze which the main factors motivate intrapreneurship in an organization as well as the consequences for productivity and competitiveness. Another factor to be analyzed is the retaining of intellectual capital on a given company. Considering that intellectual capital as the heart of business strategy by its importance, the retention of knowledge within the organizational environment is critical. It has to be done through the registry, protection, dissemination of knowledge or through talents retention policies.

1.3 Objective
This work aims to analyze the influence of intellectual capital on organizational strategy, the results of organizational performance and consequent competitive advantage. In this sense, it investigates whether questions about intrapreneurship, retention of intellectual capital and talent, in addition to the impact of these factors can bring to productivity and competitiveness in organizations.

2 Theoretical framework

2.1 Intellectual Capital
Traditional accounting, concerned only with tangible and physical assets, is grappling with an unexpected phenomenon: the market value of the organization no longer depends only on its physical asset value, but mainly its intellectual capital. In the Information Age, knowledge is becoming the most important organizational resource for companies. Gradually, the financial capital – which has dominated the Industrial Era - is giving way to intellectual capital as a basis for business operations. In a world where the traditional factors of production - nature, capital and labor - are the limits for business, companies are investing in intellectual capital in order to increase their competitive advantage. Knowledge management focuses on its strength in creativity and innovation, on the thinking and experience of people.

Because it is a theme constantly evolving, there is no consensus on the exact definition of intellectual capital. However, existing definitions are complementary and point to the direction that intellectual capital is an intangible asset that contributes to the outcome of an organization [7-11]. In existing classifications, the elements of intellectual capital are associated to knowledge and capacity for organizational learning, the management of human resources and also to information technology, brand, technological leadership, product quality, customers, among others [12]. One explanation for this may lie in the very abstract nature of these elements that are generated by equally intangibles having much knowledge as a resource (input), and as a product, and should be viewed in isolation and also in the set, they produce synergy.

Bontis’ studies [11] are a reference to the subject; they state that intellectual capital can be divided into human capital, structural capital and relational capital. The major subcomponents of human capital of an organization are skill sets of its workforce, depth and breadth of experience. Human resources can be considered as part of “live and think ” resource of intellectual capital. Have relational capital includes all the relationships that exist between an organization and any outside involved directly or indirectly with it. These may include customers, intermediaries, employees, suppliers, alliance partners, regulators, pressure groups, communities, lenders or investors. Relationships can be categorized - those are formalized through contracts and obligations, and those informal ones. Finally, the structural capital covers a range of vital factors. Among these factors are the essential operating procedures, how the organization is structured, its policies, its information flows and content of your databases, your leadership style and management, its culture and its incentive systems. Structural capital can be sub classified in culture, practices and routines, and intellectual property. The various components in these three categories can overlap.
Figure 1 – Total capital of a Firm: Enterprise Value. Source: Adapted from Bontis (1998) [11]

Intellectual capital has the potential to trace the development of knowledge storage, in terms of size, investment and effects, inducing the general analysis of the organization, in order to conceive recipients of knowledge. Intellectual capital can induce change through the development of new networks of relationships between employees, customers, technology and organizational processes. This is not just a corporate agenda, is also an issue that will raise the question of the role of people in the organization. The appreciation of employees is a challenge for the management of intellectual capital because its transformation agenda can extract knowledge from individuals and make them superfluous in the organizational structure. From the fact that the knowledge of individuals can be encoded and used in new contexts, quite apart from the individual, are introduced new concepts of organizational practices.

2.2 Organizational strategy
According to Ghemawat [13], strategy is a term that originates from the Greek "stratêgiká", which means the tactics or maneuvers of a General, or a treatise on the techniques of war. Over the last two millennia, refinements of the concept of military strategy continued to focus interpretations. Quinn [14] notes that much of the current knowledge about strategy resulted in an appropriation, adaptation and update of ideas, propositions and maximum observed already by classical authors such Zun Tzu, Machiavelli, Von Clausewitz and Foch. However, the adaptation of the terminology "strategy" to a business context waited until the Second Industrial Revolution, the second half of the nineteenth century, but really took off only in the twentieth century.

In the late nineteenth century, emerged a new type of company in the United States and then in Europe: a large vertically integrated company that invested in manufacturing and marketing and managerial hierarchies to coordinate these functions. Later, the largest of these companies began to change the competitive environment in their industries and even to overcome boundaries between industries. In the early '60s, the term "strategy" becomes relevant, with implementation in organizations. In this regard, Mintzberg [15] proposes a typology that consolidates all approaches of the strategy and its multiple application forms in the organizational context, by proposing ten schools. In the 80s, there is the school where the strategic positioning is defined as the ability of the Company to perform its functions differently.

Even today, renowned authors continue to reinforce the idea that organizational strategy is critical for any company, whatever the size and type of business, to achieve your goals, aiming to direct and coordinate efforts, define the organization and survive in hostile [16-18] environments. These studies put together concepts, ideas and provoke questions about the organizational strategy from the perspective of competitiveness, trying to demonstrate how organizational strategies increment competitiveness. Thus, the strategy provides the organization to identify which direction you want to move, guiding their skills (which accumulate and are retained in its structure) to the opportunities that arise in the market.

2.3 Organizational productivity
According to Costa [19], if we try to find out what the exact meaning of the terms efficiency and productivity, taking its starting point the uses we make of these words in texts from different authors and trends, we found that are rare terms that lend themselves to such a wide variety of different and even opposing interpretations. For Production Engineers of traditional Taylorism, productivity is simply the quantity produced per unit of time. For Neoclassical Economists, it is the relationship between the amount of production and the quantity of one of the inputs used. For a
Businessman, productivity is the ratio between gross profit and total investment. To an Ecologist, pollution control is productive and manufacturing weapons is unproductive, to the Owner of the gun industry, may be exactly the opposite.

The productivity concept was introduced and developed in organizations in order to evaluate and improve their performance. Initially, productivity was calculated by dividing the result of production and number of employees. For a long period, this formula represents the productivity of the organization. The intention was to increase production per used employee. Other ways to measure productivity emerged over time, relating the result of production with the use of other resources such as energy, raw materials, and inputs, among others [20-22]. In studies, King et.al [23] have been developed, perfected and compiled the various concepts employed by leading international centers of productivity, as Figure 2.

<table>
<thead>
<tr>
<th>International Centers of Productivity</th>
<th>Definitions</th>
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<tr>
<td>European Organization for Economic Cooperation</td>
<td>Productivity is the quotient obtained by dividing a product of its production elements.</td>
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<tr>
<td>European Association of Productivity</td>
<td>Productivity is the degree of effective utilization of the means of production.</td>
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<tr>
<td>Productivity Center of Japan</td>
<td>Productivity is scientifically minimize the use of material resources, workforce, equipment, etc, to reduce costs, expand markets, increase the number of employees, fight for real wage increases and improved living standards in the common interests of capital, labor and consumers.</td>
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<tr>
<td>Singapore's National Productivity Centre</td>
<td>Productivity is an attitude of mind that seeks to achieve continuous improvements in the systems and practices that translate attitudes into action.</td>
</tr>
<tr>
<td>Hong Kong's Council of Productivity</td>
<td>Productivity is the relationship between output and input. Should be seen as adding value by optimizing. It is a total concept that directs the key elements of competition, such as innovation, cost, quality and delivery.</td>
</tr>
<tr>
<td>National Quality Award Malcolm Baldrige</td>
<td>Productivity refers to measures of efficiency in resource use. Although the term is applied to single factors such as workforce (labor productivity), machines, materials, energy and capital, the concept of productivity applies as well to the total resources consumed in producing goods. The combination usually demands that a weighted average of various measures of unique factors, where the weight typically reflects the cost of funds. The use of an aggregate such as total factor productivity measure to determine whether the effects of global changes in the process - possibly involving resource balance - the benefits are not.</td>
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<tr>
<td>South Africa's National Institute of Productivity</td>
<td>Above all, productivity is an attitude of mind. It is the determination to improve the performance of yesterday and do even better tomorrow. It is the desire to improve the present situation, no matter how good it may seem. It is the sustained effort to implement new techniques and methods. It is faith in progress.</td>
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For purposes of this article, the definition of Colombo & Bazzo [24] is appropriate: organizational productivity is the result of all personal and organizational effort associated with the production, use, and / or shipping of products and services. In this case, attention should be focused on productivity, in its broadest sense, involving the most effective use of all means of production, not only in labor productivity. Another relevant to this study is the citation of Miyake [25], which means that the two ways to increase productivity are linked to the "process of implementation of the goods or services" and the "design process", which is linked to the management knowledge and intellectual capital issues in focus in this article.
2.4 Competitive advantage

According to Ghemawat [13], the competitive advantage depends on achieving a broader connection than competing between buyers' willingness to pay and costs. The added value concept helps integrate considerations of advantage / disadvantage and competitive conditions in the sector level on assessments of the likely profitability of each company. A company has added value when the network of customers, suppliers and complementors in which it operates, gets better with it than without - it means when the company offers something that is unique and valuable in the market. To gain a competitive advantage or value higher than that of rivals, a company needs to do things differently from them in day-by-day.

It is vital to note that due to the intrinsic concept of competitive advantage to industry analysis, in full, is the starting point for the identification of the possible advantages and guiding the actions to be taken in order to achieve differentiation. The pursuit of competitive advantage has been the basis of several studies in the field of strategy. Powell [26] mentions that "the competitive advantage is the key factor in explaining the outcome of differentiation from competitors in an industry."

Porter [17] argues that there are three potentially successful generic strategic approaches and five competitive forces that, when properly analyzed increase the potential for overcoming the industry competitors. These are generic strategies: overall cost leadership, differentiation and focus. Once defined the generic strategy, according to Porter [17], "the degree of competition in the industry depends on five basic competitive forces", namely: threat of new entrants, rivalry among existing competitors, pressure from substitute products, bargaining power of buyers and bargaining power of suppliers. Figure 2 outlines the competitive forces of Porter.

![Porter's Five Forces Model of Competition](image)

Figure 2 – Porter’s Five Forces Model of Competition. Source: Porter [17]

Another force to be reckoned with and not addressed by Porter is the strength of complementors. According to Ghemawat [13], "complementors are a ubiquitous feature of many business scenarios. They seem particularly important in situations where companies are developing entirely new ways of doing things, or when standards have important roles in the combination of very different species in systems that work well". Soon, additional products can be decisive as a force to be analyzed for the development of an appropriate strategy. Failure in observing this force, in certain cases, may render ineffective the analysis of competitive forces, such is the importance of complementary products in the analysis of the business scenario. Thus, the analysis of the five forces of Porter, the strength of complementors and the definition of generic strategy are fundamental aspects for defining the company's strategy of competition in searching of competitive advantage.
3. Research Methodology

It is observed, since the advent of the popularization of the Internet, enabling the provision of scientific papers from all research institutions around the world, formed a vast universe of information available, which needs to be managed, as which may be a complication in the identification of knowledge reliable quality process. According to Araujo [27], "bibliometrics, statistical and quantitative technique for measuring the rates of production and dissemination of scientific knowledge (...) appears at the beginning of XXI century, as a symptom of the need for the study and evaluation of activities production and scientific communication". Thus, bibliometrics help us select items through quantitative methods, and mapping the current discussion of the area related to the topic of our research knowledge.

Thus, the literature search performed in this study aimed to understand these issues, from the analysis of the following elements: alignment with the theme of research; selection of articles with citations; JCR Impact Factor (Journal Citation Reports) of the journal, and Half-life. The Impact Factor JCR (Journal Citation Reports) of the journal - abbreviated as IF - is a measure that reflects the average number of citations of scientific articles published in a given journal. The IF was created by Garfield [28], founder of the Institute for Scientific Information (ISI), now part of Thomson Reuters Corporation. Since 1972 IFs are calculated annually for ISI - indexed journals and later published in the Journal of Citation Reports (JCR), also from Thomson Reuters. It is often used to evaluate the importance of a given journal in its area, and the importance is directly proportional. Journals with higher IFs are considered more important than those with a lower IF. In mathematical terms, in a given year the IF of a journal is calculated as the average number of citations of articles that were published during the previous biennium. The concept of half-life - refers to the age of cited articles (useful in managing collections and archiving decisions). According to Elsevier (2013) [29], the Half-life (Cited Half-life) is a measure of useful life of the contents of a specific journal, or how long your content is referenced after publication. The calculation of the half-life of a journal J in year X, is the number of years, after which 50 % of the quotes (lifetime) of the contents of J, published in X, were received.

This research began with the reading of fatigue [30], Article Cutting the Gordian Knot: The effect of knowledge complexity on employee mobility and entrepreneurship. This article served as the basis of inspiration for the proposed research problem. After reading the article, the TreeCloud ™, aimed at lexical analysis of your Abstract, Introduction and Literature Review, in order to get a general overview and preliminary tool was used. It is worth mentioning that this is a dynamic and iterative process, where each step analyzes may be revised, making the search process, so that it is understood and knowledge is constructed and consolidated. After copying snippets of interest based on Article TreeCloud ™ tool, we removed the text tags to pages, labels, headers and footers to be analyzed. As a result of lexical analysis TreeCloud ™ Figure 3, shown below was obtained.

The text of the article and its basic lexical analysis inspired the literature review on the effect of intellectual capital as a constitutive element of organizational strategy, influencing the Organizational Productivity and Competitive Advantage for creating organizations. From the words in red in TreeCloud ™ gained and the experience and collaboration of the authors, we constructed a tree of keywords that guided the search for scientific production in line with the research topic. The strategy for the construction of the keyword tree, according to Farias Filho [31], has the characteristic to help in building a decision tree that seeks to represent the research objectives in key words or key terms that unfold in horizontally and vertically, with different purposes. The depth should be ensured to the splitting of the subject area in keywords or key terms that amplify the possibilities of ensuring that the subject area is covered by several conceptual aspects. Specialization has the function of causing the subdivision should be made of several layers, in order to allow researchers a perfect command of the object you want to search. Figure 4 helps to understand this process. In search Boolean logic was used to connect using "AND" and "OR", where the words within the same subject area are connected by "OR", and thematic areas are connected by "AND", since it is desired to articles found contemplate the 3 thematic areas simultaneously, as shown in Figure 5.
The initial search in "Periodicos Capes" website, with 4 thematic areas returned 3.109 million articles, which induced a more specific search in the thematic sub-areas, resulting in the universe of 2,894 articles. Then, all the items eliminated without quotes and citations, returned a total of 756 items. Then the articles with impact factor indexed and Half-life in JCR were selected, reducing the universe of items to 132 works. From the returned items, aiming closer to the goals and purposes of the research, a selective reading was conducted by the authors, who obtained a final sample of 39 articles aligned with the theme of the research.
4. **Intellectual Capital influencing Organizational Productivity**

According Curado, Henriques & Bontis [32] some publications exemplify the benefits that the organization can have from the recognition and disclosure in the balance sheet of its intellectual capital. Peña [33] argues that higher levels of financial performance are achieved by organizations that have a strategic focus on the development and retention of intellectual capital and therefore considers this to be a leading for competitive advantage. Edvinsson [34] states that intellectual capital is all the knowledge, skills and technologies used by the organization and influence the generation of competitive advantage. Generally, intellectual capital, where well-worked in an organization has the ability to leverage sustainable results, adding value by measuring or serving as support this growth. Studies Mouritsen, Bukh & Marr [35] show that the performance of intellectual capital directly influences the real capital of an organization bringing differentiated financial results.

Cyrino and Vasconcelos [36] developed an understanding of the strategic theories focused on the notion of productivity and competitive advantage. These authors suggest that theories of business strategy can be classified into two main axes. The first axis classifies studies according to their conception of the source of competitive advantage. Two cases are identified as follows: the first are theories that consider the competitive edge as an outside organization attribute positioning, derived from the structure of the industry, the dynamics of competition in the market and in the second case the authors consider that the superior performance as a phenomenon resulting from internal characteristics of the organization. The second axis discriminates the approaches according to their assumptions about competition. A division is among the researchers who have an essentially static structural view of competition, based on the notion of economic equilibrium, and researchers who focus on the dynamic and changing aspects of competition, emphasizing phenomena such as innovation, discontinuity and imbalance.

The literature review, the experiments and theories discussed in this paper made possible the authors propose a framework where aspects of intellectual capital are key factors in organizational productivity within the context of organizational strategy. When these constructs are worked interdependently, they generate competitive advantage for the organization. Figure 7 outlines the purpose of this article.

![Figure 7: Framework for generation of Competitive Advantage. Source: Author](image)

5. **Conclusion**

The contextualization and the bibliography of this article brought the knowledge [5], a set of rules, procedures and relationships to a database so that it achieves informational value; based elements of intellectual capital are intrinsically linked to the learning ability, the management of human resources, information technology, quality products and services, customer satisfaction. Thus, the intellectual capital becomes its functionality critical, such as strategic management technology in driving the knowledge to the sphere of production, through the management levels, subsidizing political or organizational decision-making, reflecting the productivity of processes.

Whereas organizational productivity, according to Colombo & Bazzo [24], as the result of all personal and organizational effort associated with the production, use and shipping of products and services, it is worth noting that large productivity gains, going forward, will bring the management of knowledge, i.e., the reduction of costs or
maximization of production, goods or services, and shall be the result not only of "how much " but also the "how" activities are performed [6], thus the management, sharing, knowledge development becomes key for optimizing productivity in an organization. All strategic effort, around knowledge should be prioritized. Shares of recognition, valuation, and disclosure of intellectual capital should be highlighted in the Strategic Plan Organizational, enabling a systemic treatment to the issue, improving conditions for enjoyment of benefits, value addition, sustainable results, support the growth and perpetuation of a business activity based on knowledge, justifying the effectiveness of the organizational strategy.

The organizational strategy is effective when there are interactions between employers and workers, when analyzing the level of employability of the primary sources of knowledge in the organization [37]. The organization must establish ownership of the means for understanding, knowledge retention and maintenance people, even if there is traffic between organizational structures, as worker mobility influences the productivity convergence [38]. Any organization that desires to possess the ability to solve major problems that affect productivity should be structured so as to profiling for each person to obtain, maintain and map knowledge, generating intrapreneurship as a source of competitive advantage, both within their industry as engaged in a global business context [39]. Managing knowledge is considered the intellectual capital in organizational strategy, in order to control and measure the impact of knowledge on productivity and thus bring competitive advantages over competitors.

The main factors that motivate intrapreneurship in an organization are collaborative profile, self-motivation, holistic vision, positive behavior. All these characteristics make a personality that is capable to overcome barriers, to look for information, data and catch them up, to treat them as knowledge. This power is the Creativity which must be considered by Strategic Plans as a competence that deserves attention for being identified, monitored and protected. The impacts and consequences over productivity and competitiveness are on a high level of priority.

It is intended to have contributed to the debate around the topic of the article, understanding that the scope of the issues addressed non allows full contemplation of the issue and recommended the development of model inter-relationships between constructs, survey, quantitative treatment as future studies. Other further study may evolve the behavioral competences over productivity organizational.

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