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THE SYSTEMIC APPROACH IN BUSINESS PROCESSES AND KNOWLEDGE MANAGEMENT: TOWARDS ORGANIZATIONAL COMPETITIVENESS

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Abstract: For decades, the competitiveness of companies has been a subject of constant study in the organizational literature. Competitiveness has been directly linked to innovation, both in the development of new products and in the improvement of processes, as well as with organizational changes. According to Porter (2009), he mentions that the factors of competitiveness are related to innovation, human capital and infrastructure, for this reason it is important to emphasize that organizations at all levels must be seen with a systemic approach, where all the interrelations between its different elements, both external and internal, are concurrent in an adequate knowledge management for the emergence of organizational competitiveness. Based on a literary review on the topics of knowledge management, systemic approach and competitiveness, this research work is presented with the aim of proposing a methodology that puts into practice the systemic approach in business processes and the management of knowledge, but not only taking into account the knowledge of knowing what, but also recognizing the importance of having knowledge in knowing how and knowing why, considering the application of knowledge in a holistic context immersed in a dynamic business environment and changing, which leads to placing special interest in human capital and innovation in business processes as a basis for organizational competitiveness.
Keywords: Systemic approach, knowledge management, organizational competitiveness.

INTRODUCTION

ANTECEDENTS

The current course of events worldwide places business organizations in a globalized perspective framed in a dynamic and changing environment at a political, economic and social level. It is undeniable that in this scenario various schools of thought have manifested that highlight the need to apply new management approaches in order to optimize organizational performance to achieve greater competitiveness. According to Porter (2009), he mentions that the factors of competitiveness are related to innovation, human capital and infrastructure, for this reason it is important to emphasize that organizations at all levels must be seen and analyzed with a global and interdisciplinary approach. [1]. This approach is called "systemic approach", which arises from the general theory of systems (TGS) exposed by Ludwig von Bertalanffy in various conferences between the years 1950-1961. TGS has become one of the most widely accepted theories in basic and applied sciences, and is enunciated as a general science of "totality" that is characterized by its holistic perspective, that is, a systemic approach based on a philosophy that studies the organism as a unit (a whole) rather than as individual parts, where what is important is what emerges from the relationships of the components of the system [2].

Inherent to the TGS, the concept of system arises, which is defined as a set of elements related to each other and to their environment, which make up a certain structure to achieve a common objective. According to Debernardo y Hurtado, "systemic thinking was born more than fifty years ago. However, still very few organizations in the world are managed within this paradigm" [3]. For this reason, in the current era of systems and knowledge, emphasis must be placed on the design of an administration system based on an organizational structure with a systemic approach, which has the capacity to meet current demands and adapts its processes to internal or external changes to encourage self-learning of the organization itself, in order to get the most out of the challenges and

opportunities that arise in a highly competitive environment.

GOAL

Based on a literary review on the topics of knowledge management, systemic approach and competitiveness, this research work is presented with the aim of proposing a methodology that puts into practice the systemic approach in business processes and the management of knowledge, but not only taking into account the knowledge of knowing what, but also recognizing the importance of having knowledge in knowing how and knowing why, considering the application of knowledge in a holistic context immersed in a dynamic business environment and changing, which leads to placing special interest in human capital and innovation in business processes as a basis for organizational competitiveness.

METHODOLOGY

To achieve the stated objective, a literary investigation was carried out regarding the issues of systemic approach, knowledge management and competitiveness, in order to base a methodology that puts into practice the systemic approach in business processes and knowledge management, as well as establish the bases that relate ideas and concepts of the exposed topics. It is important to mention that the proposed methodology is based on the systemic approach and knowledge management (KM), and describes the main characteristics that integrate it, so it is clarified that the proposed design is schematic and general, for which each organization ¬tion must create the ideal design from these elements, but may be able to include the variants that the organization itself deems appropriate according to its administrative context associated with a certain level of management itself.

THE SYSTEMIC APPROACH AND THE PROCESSES OF BUSINESS ORGANIZATIONS

As mentioned in previous paragraphs, the systemic approach, also called systems approach, means that the analysis of an organization, a process or any other defined entity is not carried out in isolation, but rather has to be addressed as a whole, always taking into account account of the constant interaction between its elements and with its environment. The objective of the systems approach is to achieve a more complete understanding of the elements of the system as a whole, that is, determining their connections and identifying the synergies that result from them [4]. The application of the systemic approach begins to gain importance due to the need to study business organizations as an open system, taking into account that there are information inputs (input) which is transformed through certain processes and then will become information. output, maintaining an exchange of information with the environment and exercising its own feedback to maintain or improve its performance. The systemic approach is applied to administration based on the premise that a business organization is a system and the interdependence of its parts must be understood. Business organizations are considered systems designed to meet predetermined goals and objectives with the intervention of people and other resources available [5].

The company is made up of people, processes and resources that generate products or services, and from this perspective, organizations consider a systemic perspective, where work and technology are two key factors to understand the new management models that better explain the capacity coordination of its components to promote continuous

learning of human resources. (See Figure 1).

Seen from a systemic perspective, companies have the following characteristics [6]:

- It is an open system in constant interaction with the environment, since it obtains resources from the environment and returns its products to it.
- It implies that the decisions or actions of a certain department directly affect others. For example, if the purchasing department does not acquire quality inputs, production work cannot be carried out in the best way.
- The systemic approach recognizes that organizations are not isolated and are influenced by the environment, for example, to obtain their resources and to demand their products or services.
- It is a socio-technical system because it is made up of people who pursue objectives and have a pattern of conduct. The company performs a technical-economic function that is the productive function, requiring a physical system structured by the conditions imposed by the technologies used.

When referring to a business organization, it is notable that there is certain information in constant flow through the various elements that make it up. This information that enters the system as input data, is transformed through the company's own processes, into an output element. Every business organization, regardless of its size, depends on and works based on its business processes. They are implicitly present in the employees, in the systems, in the interaction with customers and suppliers, as well as between the different functional areas of the company. The processes are made up of knowledge, that is, it is knowledge in action and in full practice, with which it is possible to satisfy the requirements that are demanded in the organization [7].

The ISO 9000:2005 standard defines a process as any activity or set of activities that uses resources, and that is managed in order to allow the input elements to be transformed into results. According to Cantú (2011), a process is a set of interrelated activities that transform input elements into output elements. Resources can include personnel, facilities, equipment, techniques, methods, information among others [8].

As it was mentioned by Porter (2009), it establishes that the factors of competitiveness are related to innovation, human capital and infrastructure [1]. But keep in mind that everything that happens in a system has a cause. If we are talking about innovation, the conditions must be created for this to happen, nothing can be the result of chance or appear fortuitously, in a system there are always causes and effects. As well as the execution of a well carried out process, the result is known, since it was previously analyzed and planned based on the knowledge and experience of the personnel who have participated in said process. Similarly, it can be said that competitiveness is an event that results from the correct execution of certain processes with knowledge and cause for competitiveness to arise, as well as designing an organizational structure consistent with the activities that must be carried out. Therefore, if we talk about innovation, organizational infrastructure and competitiveness, none of this can arise if there is no knowledge, which is implicit in any process carried out within an organization. In the application of the systemic approach in relation to business processes, knowledge management (KM) must be considered as an essential process for information management. KM must be put into practice in a systemic manner, with the firm purpose of continuously improving the processes involved in both the development of products

and services, and at the same time promoting an adequate environment for organizational learning to emerge.

KNOWLEDGE MANAGEMENT IN BUSINESS ORGANIZATIONS

Knowledge is considered as a valuable asset and resource of the company [9]. For most organizations, knowledge management (KM) is a novel solution, which aims to promote and optimize the transfer of knowledge in the organization. For this reason, knowledge must not be seen only as data or information, since it has its roots in the social context and human experience and requires management attention to people and culture, as well as to the organizational structure and information technologies. information [10]. KM to date has focused on processes and structures within large organizations in order to improve their performance and competitive position, showing a positive relationship between KM and organizational performance [11]. KM is a broad area of research where academics and industrialists formulate solutions and methodologies from different perspectives ranging from business, management, economics, and information technology [12]. Currently, organizational activities become more and more complex, involving numerous aspects of knowledge: legal, financial, organizational management, information technology, among other no less important factors. In the business context, organizations require KM in order to be more competitive [13]. The decision of a company to invest in innovation has become a strategic question mainly related to the KM process, since innovation reflects the capacity of a company to access, understand and exploit knowledge, and see it as one of the main sources of competitive advantage. The KM offers sustainable competitive advantages that ensure the survival or promotion of the organization, since it contributes to the performance of the organization and the flow of knowledge, affecting people, processes, products and structures in an attempt to minimize risk, improve the efficiency and create innovative processes or products [14].

To obtain a sustainable competitive advantage in organizations, knowledge has become an essential element [15]. Knowledge is characterized by being a fluid mixture of reasoning, experiences, intuitions and values that allow effective action in the organization [16]. Likewise, knowledge is assumed as an intangible, tacit and complex resource, which resides in people's minds and which needs to be made explicit in order to store, codify, share and apply it so that an organization can generate improvements and innovation [17].

In relation to the resources in companies, these are classified as tangible and intangible. Tangible resources include financial resources and physical assets identified and valued in the financial statements. Intangibles do not appear in the financial statements, this group includes intellectual capital, which is defined as all intangible resources and their interconnections, considering all those factors that contribute to the generation of value for the company [18]. Intellectual capital is made up of three factors: human capital, structural capital and relational capital. Human capital can be defined as the knowledge, skills and abilities of employees. The know-how, experience and talent of employees and managers in the organization are considered. Structural or organizational capital is defined based on the internal structure of the organization. It includes the patents, the structure, the policies, the culture, the processes, as well as the technology used in the company [19]. Regarding relational capital, it is represented by the external environment of the company, that is, they are all the relationships that an organization establishes with suppliers,

customers, competitors, government and the community [20]. Figure 2 graphically shows the factors that make up intellectual capital, as well as the elements that make up each of these factors.

KM is essentially focused on people, on the way knowledge is created, shared and used. It is not about creating a new department or acquiring a new computer system, it is about making changes in the way everyone in the organization works and providing people with access to relevant information resources [21]. There are a large number of definitions of KM from different authors in different contexts and times, among them are Nonaka and Takeuchi, for example, who define KM as the company's capabilities to create new knowledge, disseminate it throughout the organization, and incorporate it into all organizational processes [22]. Brooking defines KM as the activity that is concerned with strategy and tactics to manage people-centered assets [23]. Another definition given by Wiig mentions that it is the function that plans, coordinates and controls the knowledge flows that occur in the organization in relation to its activities and its environment in order to create essential competencies [24]. For Davenport and Klahr, QA is the systematic process of searching, organizing, filtering, and presenting information in order to improve people's understanding of a specific area of interest [25]. Stankosky defines it as the process that consists of taking advantage of intellectual assets to improve organizational performance [26].

The KM is to obtain information which will become knowledge, and for this to happen there are different elements that intervene such as leadership, strategy programming, structure organization and technology [27]. It has been recognized that knowledge is power; but the importance of knowledge depends on what can be done with it in a business environment. That is, knowledge by itself is not relevant, as long as it cannot be used to give rise to value creation actions [28]. In the business context, KM and innovation are considered important strategies to improve an organization's ability to respond to changing technology requirements and to maintain competitive performance in the business environment. The effective application of knowledge manifests itself in new forms of value for the organization, including new ideas, products and processes [29].

The literary review on GC provides several theoretical and practical approaches with the purpose of creating competencies and skills in human capital. Table 1 shows KM concepts defined by some pioneering authors in the area, where common ideas can be seen that facilitate the summary and grouping of KM processes, presenting relevant criteria that highlight theoretical and conceptual aspects, as well as such as technical aspects and intellectual capital. As can be seen in the definitions shown in Table 1, KM is essentially focused on people, on the way of creating, sharing and using knowledge, which provides the guideline that the proposed methodology must be oriented in the first instance. to the human factor, who is the starting point for the acquisition and application of knowledge.

Due to the great variety of existing concepts in the literature related to KM and its processes, as well as its application in a wide range of organizational contexts related to the human factor and productivity in different types of companies, it is pertinent to mention the results obtained. from the research by Galvis and Sánchez [30]. Table 2 shows the name of each process, as well as its purpose. The presentation of this table does not imply a specific chronological order for its application in any related project or study.

In the reviewed literature, KM is defined as a process that is basically integrated by

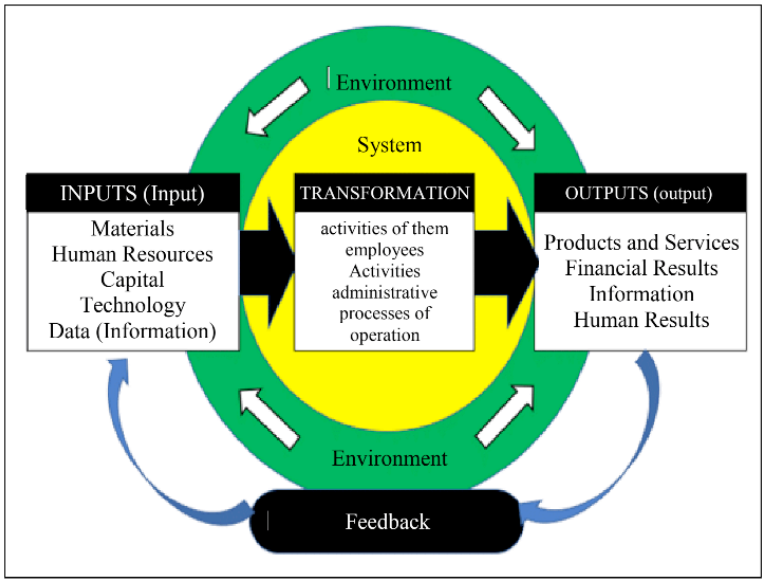

Figure 1. Systemic scheme of a business organization.

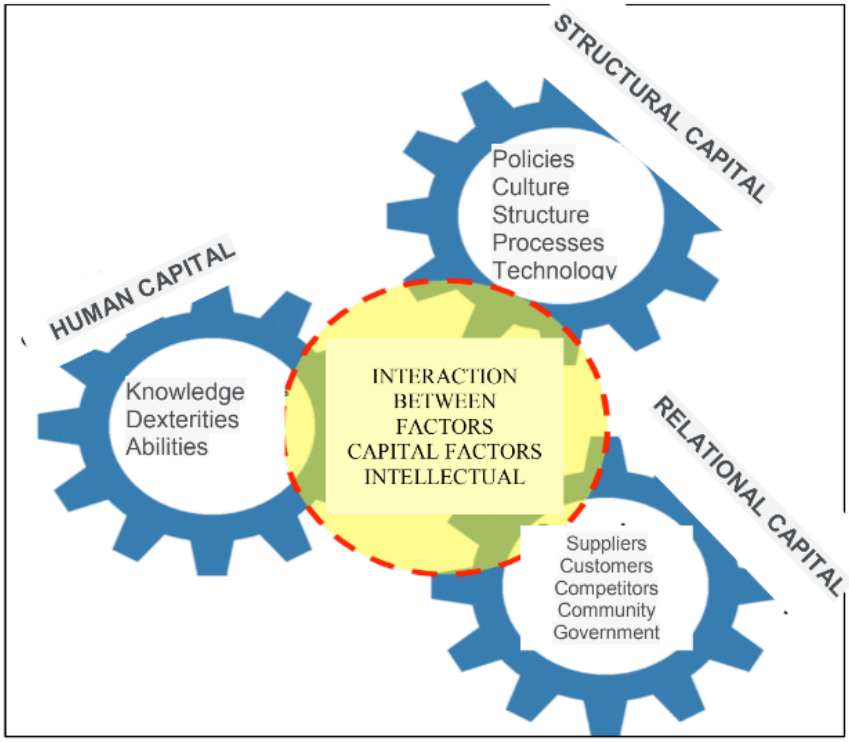

Figure 2. Factors that make up intellectual capital.

Author and year	GC Definition
Nonaka & Takeuchi (1995)	They are the company's capabilities to create new knowledge, disseminate it throughout the organization, and incorporate it into all of the organization's processes.
Brooking (1996)	It is the activity that is concerned with the strategy and tactics to manage assets centered on people.
Wiig (1997)	It is the function that plans, coordinates and controls the knowledge flows that occur in the organization in relation to its activities and its environment in order to create essential competencies.
Davenport y Klahr (1998)	It is the systematic process of searching, organizing, filtering, and presenting information with the goal of improving people's understanding of a specific area of interest.
Stankosky (2008)	It is the process of leveraging intellectual assets to improve organizational performance.

Table 1. Definition of CG by various authors.

Process	Purpose
Knowledge Transfer	Transfer organizational knowledge between people within the organization. It implies the existence of sources of knowledge and receivers of knowledge, and involves the assimilation of knowledge by the receivers.
Knowledge Creation	Create organizational knowledge. Knowledge is new when it satisfies the organization's knowledge needs or when it enables innovation.
Knowledge Codification	Explicitly represent or express the tacit knowledge of people in the organization. This means the transformation of tacit knowledge into explicit knowledge. Includes organization, storage and retrieval of explicit knowledge.
Application of Knowledge	Use organizational knowledge to achieve organizational purposes and objectives. Organizational knowledge must be applied in situations such as: formulation of strategies, decision making, definition and execution of processes, carrying out activities, problem solving, or creation and evolution of products.
Knowledge Acquisition	Acquire knowledge from sources outside the organization. The knowledge acquired must satisfy the organization's knowledge needs or must enable innovation. It implies considering the ethical and legal aspects of access and use of third-party knowledge
Knowledge Protection	Protect organizational knowledge from illegal or unauthorized uses, and exploit authorized uses to generate benefits for the organization.
Knowledge Assessment	Evaluate organizational knowledge to obtain feedback on its current state and its effectiveness in the organization and its environment.

Table 2. Purposes of QA processes

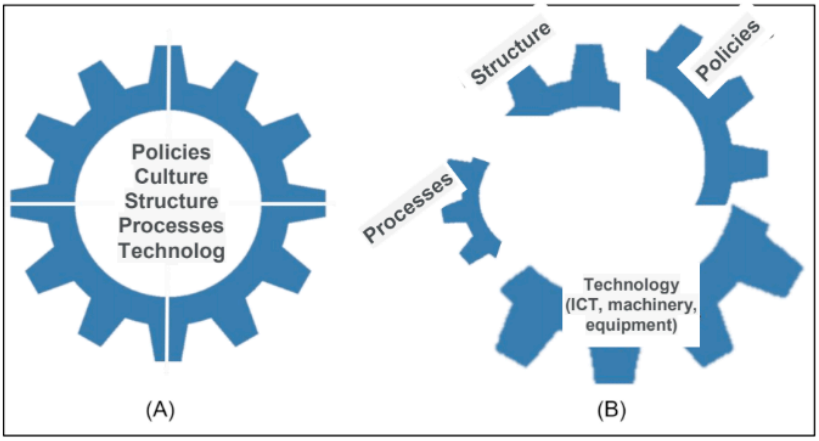

Figure 3. Elements of structural capital.

the generation, codification, transfer and use of knowledge. In the literature there are also some studies that show evidence of positive results in relation to KM and how it influences the best use of company resources. This is reflected by showing favorable aspects such as better use and development of information technologies, search for external consultancy as support in various organizational contexts, better coordination in the development of different areas of the company, as well as better departmental communication. [31].

Referring to the scenarios raised about the general panorama that involves business organizations and GC, it is pertinent to propose a methodology based on GC that integrates business processes and that allows improving the level of use of the resources involved, focusing on the participatory development of human capital. Some observations focused on processes and structures in large organizations show a positive relationship between KM and organizational performance, resulting in a better level of competitiveness as a product of knowledge exchange [32].

Figure 3: It shows how processes and technology are part of structural capital, and although there may be a relationship between both entities, it is important to emphasize that investing in technology does not necessarily make better use of it, since It does not contribute by itself to improving the interaction between the factors of intellectual capital if there is a lack of a systemic approach to KM among employees, managers and all collaborators who have contact with the company. In such a way that, when the situation arises where the elements of structural capital do not maintain an adequate balance, giving greater importance to the adoption of technology and very little attention to its relationship with the other elements, results in many organizations failing in the implementation of new technologies, since little attention is given to their organizational nature, without fully understanding their link to the company's strategy and objectives [33]. For this reason, it becomes inappropriate to continue implementing the adoption of technology without considering human capital in its proper dimension and its interaction with the elements of structural capital, which by presenting a disproportion between its components "will not be able to integrate it into a single piece", which can lead to a situation where a lot of technology is adopted for poorly defined processes, or the case of having well-defined processes that do not have adequate technological support or an organizational structure consistent with the business processes or with appropriate policies (see Figure 3.B).

However, addressing the concept of what a business process is, it can be seen that its definition also entails the application of a systemic approach, since technology, knowledge and people's skills are interrelated. This is where the proposal for a new model arises, with the aim of promoting the conditions to improve the level of use of knowledge in the processes of organizations, where a methodology is planned and implemented that allows achieving, through the knowledge that There is in the organization as well as the one that is acquired from abroad, a strengthening of the interrelation between the factors of intellectual capital in relation to business processes and the application of the systemic approach. Once the concept of KM and the processes that make it up are understood, and taking into consideration that the KM theory is characterized by a multidisciplinary approach, the development of the proposed methodology is based on the combination of some of the processes of the GC, mainly those related to the identification, acquisition, application, codification, sharing and evaluation of knowledge, since these

processes conform to the basic aspects of the systemic approach. This is detailed in the next section, where the proposed methodology is described.

PROPOSED METHODOLOGY: THE SYSTEMIC APPROACH IN BUSINESS PROCESSES AND KNOWLEDGE MANAGEMENT

The proposed methodology is based on the systemic approach and KM, mainly taking into account the participation of human capital and its relationship with business processes (see Figure 4), since it is people who play the main role because they are the carriers of knowledge. Next, the elements that make up the methodology and how the interaction between its stages is given are explained.

PHASE A: IDENTIFICATION OF KNOWLEDGE

It consists of determining the current state, identifying the existing knowledge and the knowledge needs of the organization in relation to its processes, as well as its relationship with external providers that are in a position to advise the company. Unlike a traditional technology acquisition process, here from the beginning of the model the application of the KM is included, since it must have the participation of the personnel involved in the process in question. Each company must undertake the task of preparing a list of questions, which must be posed according to the characteristics of the business processes involved with the application of technology or new knowledge that may be necessary. Table 3 shows an example of questions that can be asked in relation to business processes and the application of new knowledge.

ASSESSMENT STATUS 1:

It consists of answering and evaluating all the points related to suppliers, technology, processes, training, human resources, costs, implementation time, as well as the fulfillment of objectives, taking into account the questions related to Who? Which? Where? How? Because? When? How much? The evaluation of the answers collected has the purpose of knowing the process in detail and selecting the supplier or suppliers with the most appropriate profile in knowledge and experience related to the business process, and have the capacity to cover the knowledge needs and create the suitable conditions for the company to improve the use of knowledge in business processes. Therefore, it is very important that these providers are not only technology providers, but also have knowledge in the application of said technology in order to propose an adequate training plan. If this assessment status does not provide a clear understanding of the process being analyzed by the company, or does not provide adequate prospects in knowledge and experience that can provide support as advisors, the questions must continue to be reframed and evaluated both for the company and with other suppliers that meet the conditions as favorably as possible. Once this evaluation is satisfactorily completed, we proceed to phase B.

PHASE B: ACQUISITION AND APPLICATION OF KNOWLEDGE

This is one of the crucial parts of the methodology, since it is preceded by the evaluation of the current situation of the company and, in turn, contemplates two very important QA processes: acquisition and application. In this phase, it must be considered that the acquisition of knowledge must be oriented to satisfy the information needs initially raised, so that the application of the acquired knowledge must be linked to various aspects that involve the use of technological equipment, software application, as well as as relationships between different areas of the

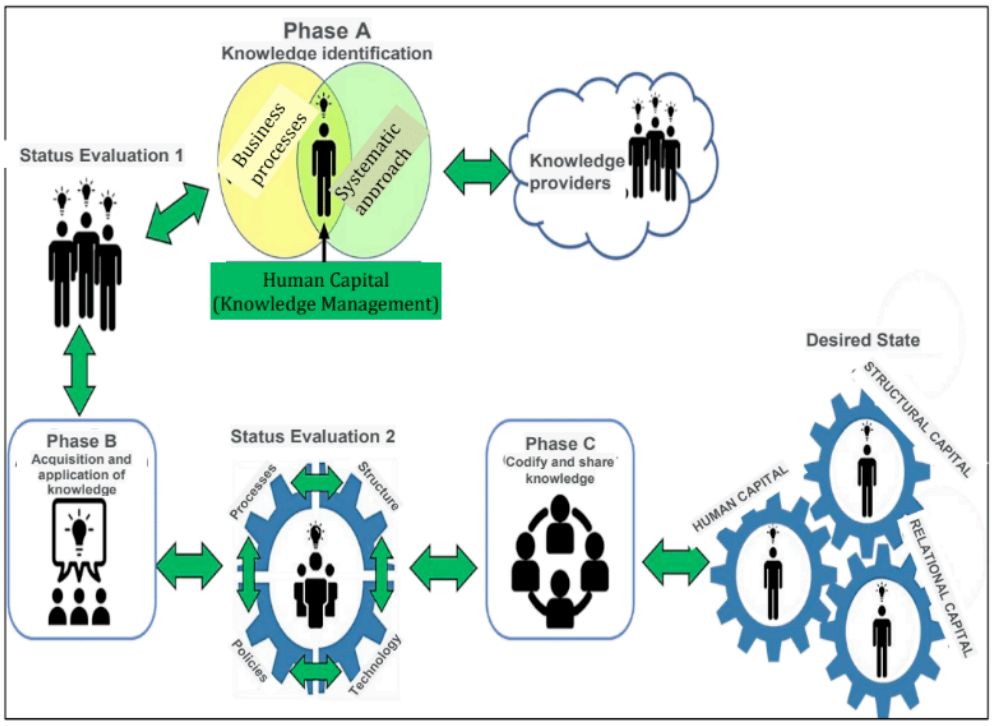

Figure 4. Proposed methodology. The systemic approach and KM.

Name of process:
Example of asking some questions:
What is the purpose of this process? When is the process done? What are the activities involved in the process? Who performs the process? What other functional areas of the company are related to the process? How long does the process take? What type of technology is applied to carry out the process?

Table 3. Example of questions related to business processes.

company, and that in one way or another are directly manifested in the elements that make up human capital, as well as structural capital and relational capital. The application of said knowledge must provide results in accordance with the purpose set out in the business process, which implies the participation of all employees, collaborators and managers in order that the acquired knowledge is applied in the work areas that were previously defined. Once this phase is completed, it continues with the evaluation state 2.

ASSESSMENT STATUS 2:

In this state of evaluation, the interrelation of the elements of human capital (knowledge, skills, abilities) will allow evaluating if the application of knowledge is favorable. At this point, some questions related to the application of knowledge can be raised, such as, for example, is the adoption of technology consistent with the business process analyzed? Is the business process supported by an appropriate organizational structure? Are the company's policies adequately supported by the organizational structure, as well as by the processes and applied technology? Does the personnel involved have the necessary knowledge and skills to apply the technology? If the results of this evaluation reflect an adequate application of knowledge, then a good level of coupling between the elements of structural capital has been established in the first instance. This means that in the adoption of technology, human capital and its interaction with the elements of structural capital have been considered, "managing to integrate it into a single piece". If you look at Figure 4, in assessment state 2, this is represented by the two-way arrows between processes, technology, policies and structure, which means that the necessary conditions are present to move to phase C of the evaluation. methodology. In the event that this evaluation state does not provide satisfactory results, phase B must be reinforced and evaluation state 1 analyzed accordingly, which can lead back to restart with phase A, this in order to advance to the next phases. subsequent stages, or return between phases and previous evaluation states as deemed necessary to achieve the purpose of each stage of the methodology, and not advance to subsequent stages until the requirements of previous stages have been fully covered.

PHASE C: CODIFY AND SHARE KNOWLEDGE

In this phase of the model, two other KM processes are carried out: codifying and sharing knowledge. Firstly, knowledge is codified, that is, it consists of the transformation of tacit knowledge (undocumented knowledge, based on experiences and skills of the person) to explicit knowledge (documented knowledge to be later used in the company). Coding includes organization, storage, and retrieval of explicit knowledge. In this phase, the documentation of everything related to the applied knowledge on the implementation of technology is carried out, as well as the processes and people involved. Manuals of procedures or diagrams can be elaborated that show the necessary knowledge for certain process. The documentation can be by the means that the company has, giving preference to new technologies, whether they are documents or electronic files to facilitate their organization, storage and recovery. Once the knowledge is codified, there will be sources of knowledge that will reinforce human capital by having better conditions to adequately share knowledge, relying on the same technology used by people within the organization.

DESIRED STATE:

Improve the use of knowledge in business

processes. If the desired state proposed by the methodology has been achieved, it means that all the stages of the model have been carried out satisfactorily and systemically and the integration of the three factors of intellectual capital has been achieved. However, if the last phase of the methodology, related to the sharing of knowledge, is not being achieved, other strategies focused on the company's personnel must be implemented. For example, to share knowledge it may be necessary to foster good attitudes among people, both those who receive and those who provide the knowledge. It must be taken into account that the participation of human capital provides feedback to structural capital and relational capital so that the factors of intellectual capital interact properly, thereby ensuring that all people collaborate in a work environment that leads to constant improvement. learning and continuous improvement of the company.

CONCLUSIONS

According to the literary review carried out, it is perceived that the application of the systemic approach is a tool that promotes competitiveness and productivity. The proposed methodology proposes the application of the systemic approach and the KM as the starting point to obtain better results in the business processes of companies, since only human capital through the acquisition and application of knowledge can create the conditions for make creative use of knowledge, providing the organization with a tool to improve and differentiate the management of both human and material resources, and to be able to implement improvements in its processes, products or services. Consequently, it can be seen that continuous learning and the ability to develop new skills in the application of KM promote the development of better business activities. Although many factors are involved in its implementation, the main factor on which it must be based is human capital, which in proportion to their knowledge, skills and abilities make it possible for the advantages of incorporating the systemic approach to arise in all its areas, such as management. internal, communication with customers and suppliers, sales systems, marketing, production and human resources. The main aspect that must be considered is that learning of the human capital that makes up each of the functional areas of the company is required, learning both at the individual and organizational level, since the absorption capacity depends on the necessary knowledge related to the adoption and implementation of new methodologies, as well as the characteristics of the learning environment that involves both company personnel and external advisors.

As a consequence, companies, as a measure to "take advantage of the knowledge" of experts, must know how to identify and acquire knowledge of their environment, but it must be emphasized that the results are not generated automatically by the mere fact of identifying and acquiring knowledge. knowledge, since it is required to put this new knowledge into practice according to its organizational dynamics. The application of the proposed methodology shows the GC processes and with their respective evaluation states, the integration of the systemic approach in business processes is evident, achieving a good balance between human capital, structural capital and relational capital. With the application of the systemic approach, it is possible to see the adaptability in different business processes to analyze and evaluate the knowledge needs and thereby obtain the best use of its implementation, since in a constantly dynamic environment, it is essential to be aware of the both technological and methodological changes that impact the improvement of processes, which leads to the

constant updating of knowledge as a basic resource for organizations to maintain an adequate level of competitiveness.

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