

Alignment of Collaborative Capacities for Sustainability through the Analytic Hierarchy Process: a study in a hotel

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Abstract

The development of Collaborative Capabilities for Sustainability (CCS) by companies is a fundamental practice for lasting permanence in the market. However, literature on CCS is still scarce, especially when considering its assessment with mathematical modeling. This study aims to quantitatively analyze the CCS of a hotel that operates in the tourism cluster in Paraíba, Brazil. As such, aspects of the Relational View and the Natural Resources Based View and Collaborative Capacities were considered, as well as the multicriteria Analytic Hierarchy Process (AHP) approach. The study was conducted in a hotel that is part of a cluster; as a result, it was identified which CCS attributes should be improved to increase the hotel's potential of collaborating for sustainability, contributing to a successful decision making. Among the contributions of this study, we highlight the knowledge development on the subject, not yet explored in literature, and the quantitative assessment of CCS with a multicriteria tool.

Keywords: Collaborative Capability for Sustainability (CCS); Analytic Hierarchy Process (AHP); Cluster.

Resumo

Alinhamento de capacidades colaborativas para sustentabilidade por meio do Analytic Hierarchy Process: um estudo em um empreendimento hoteleiro

O desenvolvimento de Capacidades Colaborativas para Sustentabilidade (CCS) por parte das empresas é uma prática fundamental para a permanência duradoura no mercado. No entanto, a literatura sobre CCS ainda é escassa, principalmente quando se considera a avaliação desta por meio de modelagem matemática. Este artigo tem como principal objetivo analisar quantitativamente a CCS de um hotel que atua no *cluster* de turismo no estado da Paraíba. Para isso, foram levados em consideração aspectos da visão relacional, da visão baseada em recursos naturais e de capacidades colaborativas, bem como foi utilizada a ferramenta multicritério *Analytic Hierarchy Process* (AHP). Como resultado, verificou-se que os atributos de CCS que devem ser melhorados para ampliar o potencial de colaborar para a sustentabilidade do hotel avaliado são: alocação de

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recursos e gestão da cadeia de valor. Dentre as contribuições do artigo, destacam-se o avanço do conhecimento sobre a temática ainda não explorada na literatura e a avaliação quantitativa da CCS por meio de uma ferramenta multicritério.

Palavras-chave: Capacidade Colaborativa para Sustentabilidade (CCS); *Analytic Hierarchy Process* (AHP); *Cluster*.

Resumen

Alineación de capacidades colaborativas para la sostenibilidad por medio de Analytic Hierarchy Process: un estudio en un emprendimiento hotelero

El desarrollo de Capacidades Colaborativas para la Sostenibilidad (CCS) por parte de las empresas son prácticas fundamentales para la permanencia duradera en el mercado. Sin embargo, todavía es escasa la literatura sobre CCS, principalmente cuando se considera la evaluación de éstas por medio del modelado matemático. Este artículo tiene como principal objetivo evaluar cuantitativamente la CCS de un hotel que actúa en el *cluster* de turismo en el estado de Paraíba. Para ello, se tomaron en consideración aspectos de la visión relacional, de la visión basada en recursos naturales y de capacidades colaborativas, así como se utilizó la herramienta multicriterio *Analytic Hierarchy Process*. Como resultado, se verificó que los atributos de CCS que deben ser mejorados para ampliar el potencial de colaborar con la sostenibilidad del hotel evaluado son: Asignación de Recursos y Gestión de la Cadena de Valor. Entre las contribuciones del artículo, se destacan el avance del conocimiento sobre la temática aún no estudiada en la literatura y la evaluación cuantitativa de la CCS por medio de una herramienta multicriterio.

Palabras clave: Capacidad Colaborativa para la Sostenibilidad (CCS); *Analytic Hierarchy Process* (AHP); *Cluster*.

INTRODUCTION

Collaborative relationships between partners result in many advantages, one of them is sustainability (Van Hoof & Thiell, 2014). In the organizational context, sustainability is an essential factor for the success and reputation of the business (Albino, Dangelico, & Pontrandolfo, 2012), as it seeks to balance economic and socio-environmental aspects (Luo, Chong, Ngai, & Liu, 2014).

Some dynamic capacities must be developed for companies to collaborate to each other and create joint value, one of them being the collaborative capacity (CC) (Choi & Hwang, 2015). A dynamic capacity is originally defined as “the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments” (Teece, Pisano, & Shuen, 1997, p. 516). Thus, CC is a type of dynamic competence capable of creating, expanding, or purposely modifying its resource base to include the resources of its partners (Helfat et al., 2007).

Therefore, the development of CC by companies and their adaptation to the market necessities are fundamental practices for the permanence of the business. Nowadays, consumers are increasingly demanding sustainable products and services (Luo et al., 2014); Thus, the development of CCs that aim at a sustainable behavior can be a starting point for organizations.

When analyzing literature, authors mention the relevance of collaborating for sustainability, but this was not the focus of the studies. Therefore, this article

has as main objective to assess the CCS of a company that operates in a tourism cluster in Paraíba, Brazil. For the CCS assessment, the multicriteria Analytic Hierarchy Process (AHP) approach will be used, and the CCS attributes proposed by Gonçalves (2018) are adopted: resource allocation, knowledge management, training and intensification of partnerships, value chain management and effective governance.

The CC and sustainability assessment with quantitative methods is scarce in literature. Seeking to overcome this deficiency, the AHP was selected because of its ability to convert a complex problem into a simple hierarchy, its flexibility, its intuitive appeal and its ability to mix qualitative and quantitative attributes in the same decision-making exercise (Pohekar & Ramachandran, 2004). Moreover, the use of AHP is justified due to its performance in different problems related to sustainability issues over the years (Allaoui, Guo, Choudhary, & Bloemhof 2018; Blanco, Amarilla, Martinez, Llamosas, & Oxilia, 2017; Dey & Cheffi, 2013; Stefanović, Milutinović, Vučićević, Denčić-Mihajlov, & Turanjanin, 2016; Pendred, Fischer, & Fischer, 2016; Yakovieva, Sarkis, & Sloan, 2009).

Most of the studies whose focus is CCS were conducted within the context of supply chains. Seeking to expand the research to other configurations, this study selected companies that work in the tourism cluster in Paraíba, Brazil. An industrial cluster is a geographic concentration of companies in the same industry or associated industries, interconnected by support institutions. These companies have resources and capacity that can influence their performance and they strategically compete and collaborate among themselves (Graça & Camarinha-Matos, 2017; Hervás-Oliver & Albors-Garrigós, 2007; O'Dwyer, O'Malley, Murphy, & McNally, 2015).

Nevertheless, assessing the CCS of a company that is part of a cluster in tourism is relevant due to the general belief that participating in a collaborative tourism network produces benefits for companies, such as sharing knowledge, reducing transaction costs and increasing perceived value (Van der Zee & Vanneste, 2015). The structure of the collaborative network is also characterized by a wide variety of complementary and competing stakeholders that are interrelated and, together, shape the tourist product (Van der Zee & Vanneste, 2015). Finally, a large part of the research about sustainability aspects has focused on the study of manufacturing companies. Few studies focus on the services sector, especially in tourism companies, such as hotels (Leonidou, Leonidou, Fotiadis, & Aykol, 2015).

In order to achieve the objectives, this study is structured in six sections, in addition to this introduction. In the next section, theoretical assumptions about CCS are discussed, followed by an overview of AHP. Subsequently, the methodological procedures are described, and the results obtained regarding the empirical study are shown, followed by a discussion. In sequence, the conclusions, contributions, limitations, and suggestions for future work are presented.

COLLABORATIVE CAPACITY FOR SUSTAINABILITY

Interorganizational networks are formed from entities that have characteristics such as autonomy, geographic distribution, and heterogeneity

in terms of operational environment, culture, share capital and objectives. These entities can consist of organizations and people who collaborate to achieve common goals (Camarinha-Matos & Afsarmanesh, 2005). Interorganizational relationships may be arranged across multiple networks, such as clusters (Molina-Morales & Martínez-Fernández, 2009; Matinheikki, Arto, Peltokorpi, & Rajala, 2016; Saunila, Rantala, Ukko, & Pekkola, 2017), supply chains (Stadtler, 2009), strategic partnerships (Parung & Bititci, 2006, 2008; Sarkar, Echambadi, Cavusgil, & Aulakh, 2001), agglomerations (Teller, Alexander, & Floh, 2015), multi-stakeholders configurations (Rühli, Sachs, Schmitt, & Schneider, 2017) etc.

Thus, the different modalities of interorganizational networks show that collaboration is extremely important and represent a close relationship between partners (Parung & Bititci, 2006, 2008). Different theories advocate inter-organizational collaboration as a source of competitive advantage, such as the Relational View (RV) (Dyer & Singh, 1998). This theory complements the resource-based view (RBW), arguing that resources and capabilities can encompass limits beyond a company's boundaries, providing relational generation of income. These incomes can be generated through investments in specific relationship assets, routines of sharing, combinations of complementary resources or capacities, and effective governance mechanisms (Dyer & Singh, 1998).

In this context, the CC approach proposed in this study derive from relational incomes, being defined as the capacity of an interorganizational network members in leveraging resources and knowledge of other actors, to access external sources, to absorb knowledge and critical resources of their partners, to increase their sustainability, to exchange information and values, to increase consumer satisfaction and to solve problems (Choi & Hwang, 2015; Dangelico, Pontrandolfo, & Pujari, 2013; Luzzini, Brandon-Jones, Brandon-Jones, & Spina, 2015; Paulraj, 2011; Van Hoof & Thiell, 2014).

One of the aspects presented in the definition of CC relates to the ability in collaborating on behalf of sustainability, which is one of the challenges faced by organizations in the current scenario. That happens because many social actors require initiatives focused on sustainability and these initiatives are associated with complex issues involving the environment and with the companies' lack of ability to deal with such requirements (Albino et al., 2012). One way to minimize this challenge is by practicing inter-organizational collaboration, which guarantees the achievement of superior sustainable performance to partner companies (Paulraj, 2011).

The achievement of sustainable objectives involves complex challenges, therefore, the involvement of companies in interorganizational collaborations to help the development of these objectives is recognized (Albino et al., 2012; Choi & Hwang, 2015). As such, companies need to develop some CCS, that is, to use interorganizational network partners (Paulraj, 2011), as Chart 1 shows.

These capacities may help to adopt strategies advocated by the natural resource-based view (NRBV), i.e., strategies to prevent pollution, product management, and clean and base of the pyramid technology (Hart, 1995; Hart & Dowell, 2011). NRBV discusses the achievement of competitive advantages for companies when implementing green strategies (Choi & Hwang, 2015).

Among the benefits of adopting such initiatives is the reduction of costs, the best positioning of the company regarding competitors and the way the company will be inserted in the market in the future (Hart, 1995).

Thus, the strategies of (1) pollution prevention are aimed at minimizing emissions, effluents and waste; (2) product management ensures that all those involved in the life cycle of a product share responsibility for reducing their environmental impacts; (3) clean technology is directly related to the strategic capacity of sustainable development, because it deals with how companies create new competencies and how they position themselves to have competitive advantage while their industry develops (4) the base of the pyramid relates to the attention that corporations give in alleviating the poverty of citizens in need (Hart, 1995; Hart & Dowell, 2011; Choi & Hwang, 2015).

Chart 1 – Factors for the development of CCS

Factors	Description	Authors
Resource allocation	It refers to investment in specific assets that result in better coordination and adjustment of boundaries between partner companies. Resource allocation should be oriented both to the organizations that are members of the relationship and to the focal company.	(Dangelico, Pontrandolfo, & Pujari, 2013; Hartmann & Germain, 2015; Hofmann, Theyel, & Wood, 2012; Jiang, Mavondo, & Matanda, 2015 Rai, Patnayakuni, & Seth, 2006; Capaldo, 2007; Schilke & Goerzen, 2010.)
Knowledge management	It refers to the exchange of interorganizational knowledge. For that, organizations need to manage their knowledge to effectively perform this exchange. This requires a process of articulation, coding, sharing and internalization of knowledge.	(Dangelico et al., 2013; Hidayah, 2016; Lemmetyinen & Go, 2009; Rai et al., 2006; Schilke & Goerzen, 2010; Spekkink, 2015; Van Hoof & Thiell, 2014; Veldhuizen, Blok, & Dentoni, 2013; Woo, Kim, Chung, & Rho, 2016; Worley, Feyerherm, & Knudsen, 2010.)
Development and intensification of partnerships	It refers to the opening of a company to form partnerships and develop collaborative culture to create and manage new knowledge.	(Capaldo, 2007; Lemmetyinen & Go, 2009; Luzzini et al., 2015; Ryan, Kajzer Mitchell, & Daskou, 2012; Schilke & Goerzen, 2010; Van Hoof & Thiell, 2014; Spekkink, 2015; Woo et al., 2016; Worley et al., 2010.)
Value chain management	It refers to the gains of relational incomes when combining scarce resources and capacities and they complement each other resulting in joint creation of new products, services, and technologies.	(Choi & Hwang, 2015; Dangelico et al., 2013; Hartmann & Germain, 2015; Jiang et al., 2015; Rai et al., 2006; Seok & Nof, 2014; Van Hoof & Thiell, 2014; Vanpoucke, Vereecke, & Wetzels, 2014.)

(continues...)

Chart 1 – Continuation

Factors	Description	Authors
Effective governance	It refers to the reduction of transaction costs within the network through governance mechanisms. Governance can refer to aspects that show the organization’s commitment to raising awareness about sustainability among the organization and its stakeholders e to improving its values, initiatives, and policies for better sustainability performance.	(Capaldo, 2007; Hartmann & Germain, 2015; Hidayah, 2016; Jiang et al., 2015; Lemmetyinen & Go, 2009; Li, Zhou, & Wu, 2017; Paulraj, 2011; Ryan et al., 2012; Schilke & Goerzen, 2010; Vanpoucke et al., 2014; Ziggers & Henseler, 2009.)

Source – Gonçalves (2018)

For these strategies to be implemented, Gonçalves (2018) proposed some sub-attributes related to the collaborative capacities presented in Chart 1, as Chart 2 shows.

Chart 2 – Sub-attributes of CCS for the implementation of strategies according to NRBV

Attributes	Sub-Attributes
Resource allocation	Innovation
	Adoption of technologies
Knowledge management	Absorptive capacity
	Knowledge sharing
Development/intensification of partnerships	Susceptibility for partnership
	Strategic alignment
Value chain management	Green development of new products
	Operations Management
Effective governance	Long-term relationship
	Network structure

Source – Gonçalves (2018)

AN OVERVIEW OF THE ANALYTICAL HIERARCHY PROCESS (AHP)

The AHP is among the most widely used multiple criteria decision analysis (MCDA) (Zyoud & Fuchs-Hanusch, 2017). The MCDA can be a form of integrated evaluation for sustainability, due to its need to use an approach for analysis that includes numerous factors related to sustainable development, such as high uncertainty level, objectives, interests, many conflicting perspectives, and involvement of biophysical and socio-economic systems (Jiang, Mavondo, & Matanda, 2015). These methods can be used to quantify the consideration of stakeholders and decision makers about (mostly non-monetary) factors, aiming at comparing possibilities of action (Huang, Keisler, & Linkov, 2011).

The decision about which MADM should be adopted in a study depends on aspects such as the problem in question, the criteria used to achieve sustainable

initiatives, the criteria selection methods and how decision-making processes occur (Stefanović et Al., 2016). In this study, the AHP is relevant due to its ability to convert a complex problem into a simple hierarchy, its flexibility, its intuitive appeal, and its ability to mix qualitative and quantitative attributes in the same decision-making exercise (Pohekar & Ramachandran, 2004).

The application of AHP is based on four principles (Saaty, 1980):

- 1) Decomposition – a complex decision problem is decomposed into a hierarchy of criteria and alternatives that are easier to analyze and compare independently.
- 2) Prioritization – involves several pairwise comparisons, performed by specialists, between the elements of the same level in relation to the element of the top level of the hierarchy.
- 3) Synthesis – priorities are gathered through the principle of hierarchical composition to provide the overall assessment of available alternatives.
- 4) Sensitivity analysis – the stability of the result is determined through the test of the best alternative given to the change in the criteria list.

To perform the comparisons, a scale of numbers is required (Chart 3) that indicates how many times an element is more important than another in relation to the comparison criterion (Saaty, 2008). The importance attributed to the criteria act in a significant way in obtaining the results, therefore the decision makers should perform the classification with great attention (Stefanović et al., 2016).

Chart 3 – Fundamental scale of absolute numbers

Importance intensity	Definition	Explanation
1	Equal importance	Both elements equally contribute to the objective
3	Moderate importance	Experience and judgment slightly promote one element over the other
5	Strong importance	Experience and judgment strongly promote one element over the other
7	Very strong importance	One element is very strongly promoted over the other
9	Extremely strong importance	An element is promoted at least with one difference in order of magnitude
2, 4, 6, 8	Intermediate values	Used as consensus values between opinions

Source – Saaty (2008)

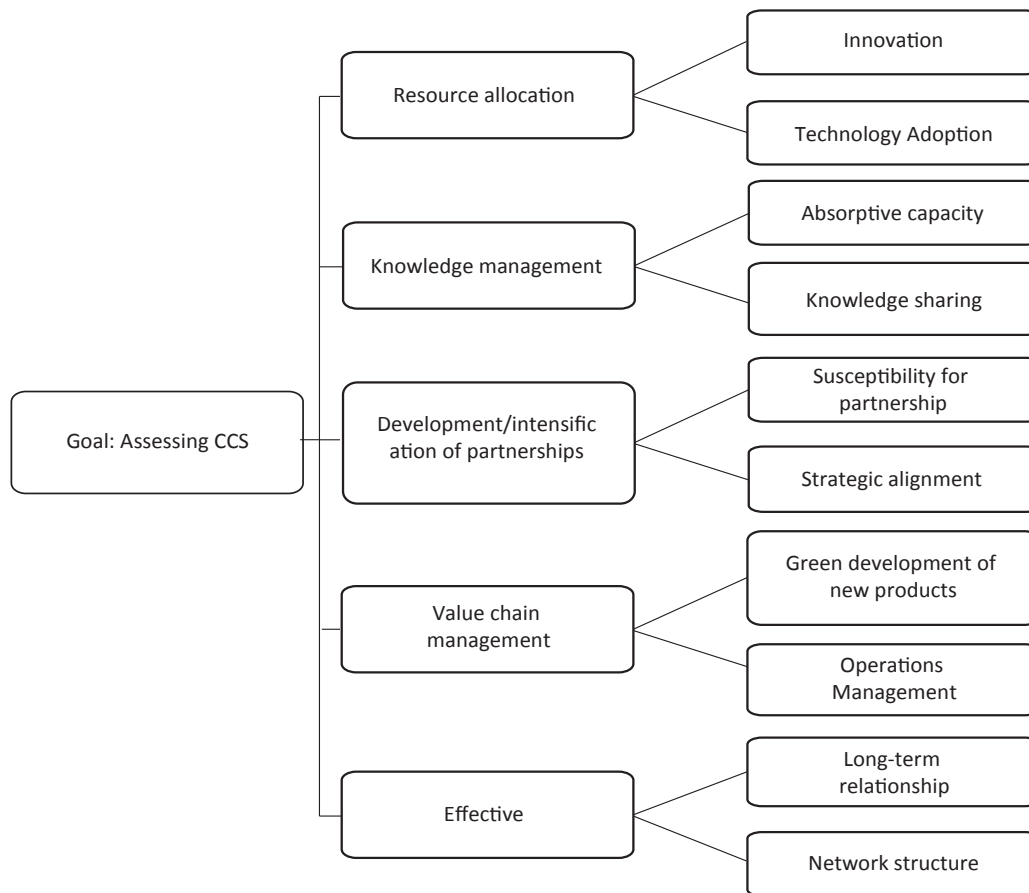
AHP also employs a consistency ratio (CR) to verify judgments. Inconsistency likely occurs when decision-makers make reckless errors or exaggerated judgment during the pairwise comparison process. Inconsistencies can also be caused by the evaluators' struggle in associating concepts that seem to have no direct relation or

by the consideration of externalities that may compromise the results (Pendred et al., 2016). The consistency ratio of the judgments is $CR \leq 0.10$ (Saaty, 1990).

METHODOLOGY

The problem proposed in this article was decomposed in hierarchies (Figure 1), in which the first level corresponds to the general objective of the problem, the second to the criteria and the third to the alternatives.

Figure 1 - Hierarchical structure



Source: Elaborated by the authors (2017)

To evaluate the hierarchy developed, it was necessary to apply it in a company that acted in an interorganizational network. As such, a company (a hotel) that worked in the Tourism cluster, in João Pessoa (Paraíba, Brazil) was selected. In the organization, the sustainability aspects were considered important; thus, it was possible to define the relevance level of each element presented in Figure 1, which is one of the selection criteria for the development of the study case. The hotel, despite being characterized as a small company, it also belongs to a hotel chain, in which the property and management of the company are independent. The hotel also showed great interest in assessing its ability to collaborate with its partners to develop sustainable initiatives, since consumers are increasingly demanding sustainable products and services.

The sustainable initiatives adopted by the hotel are still incipient and comprise actions such as the planting of trees in the parking lot and the promotion of waste collection in the common areas and in the rooms. The company's main partners in the tourism cluster are the other hotels in the same city, some suppliers and support agencies, such as Paraibana tourism company (PBTUR – Empresa Paraibana de Turismo), Brazilian Micro and Small Enterprises' Support Service (Sebrae – Serviço Brasileiro de Apoio às Micro e Pequenas Empresas) etc. This collaboration between the agents of the cluster aims to devolve the capital into a tourist destination with greater national visibility.

The data collection instrument adopted was the structured interview. The guide consisted of closed questions, and the Saaty scale (Chart 3) was used to assess the importance of the elements. The guide also contained open questions to assist researchers in understanding the reasons that led the researcher to assign certain scores (see Table 3). This instrument was applied with the commercial manager of the hotel. Data collection was performed during May 2018.

For the result analysis, the technique of content analysis was used, because it is a technique that can be used both in qualitative and quantitative and mixed analyses (White & Marsh, 2006). Tables 1 and 2 show categories used for the analysis of the study results. Thus, after the interviews were performed, they were transcribed, and the results were compared with the theory. Subsequently, for the use of AHP, a pairwise comparison was performed in each of the criteria regarding the main objective (which are presented in Figure 1). To assist in the comparisons between the criteria and the CR estimate, the *Super Decisions* software package was used. After a data synthesis, the comparison was performed by pairs of the alternatives in relation to the criteria (also in Figure 1).

RESULTS AND DISCUSSION

Application of the Analytical Hierarchy Process (AHP)

Table 1 shows the resulting matrix from the pairwise comparison of the criteria related to the main objective.

Table 1 – Criteria comparison matrix

	Resource allocation	Knowledge management	Development/intensification of partnerships	Value chain management	Effective governance
Resource allocation	1	1/2	1/3	4	1/3
Knowledge management	2	1	1/3	6	1/3

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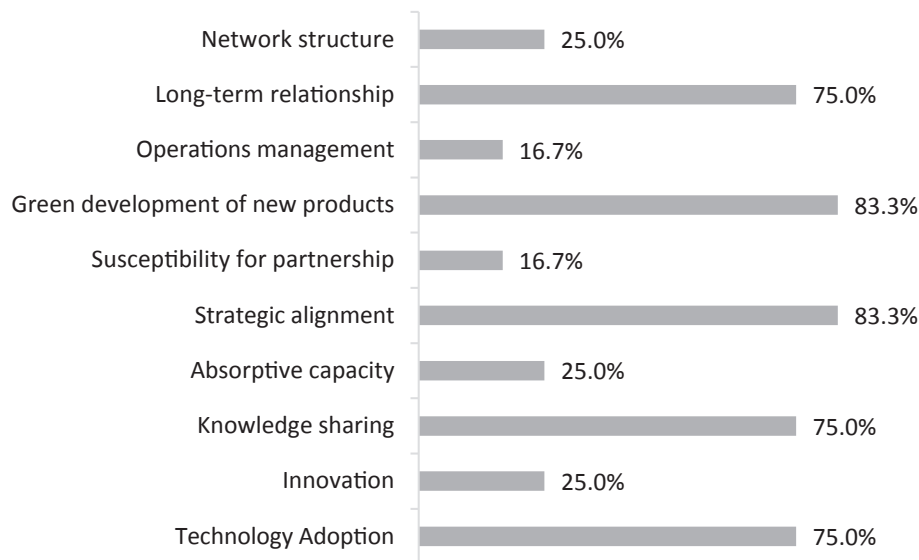
Table 1 – Continuation

	Resource allocation	Knowledge management	Development/intensification of partnerships	Value chain management	Effective governance
Development/intensification of partnerships	3	3	1	7	2
Value chain management	1/4	1/6	1/7	1	1/4
Effective governance	3	3	1/2	4	1

Source: Elaborated by the authors

From this matrix of comparisons, we estimated the priority vector or Eigen vector, which is responsible for defining the contribution of each criterion in the organizational goal. Then, the consistency of the manager’s opinion was verified for decision-making. The consistency ratio found was 0.0610. Since the value was lower than 10%, the matrix can be considered consistent and the values of the vectors are coherent (Graph 1).

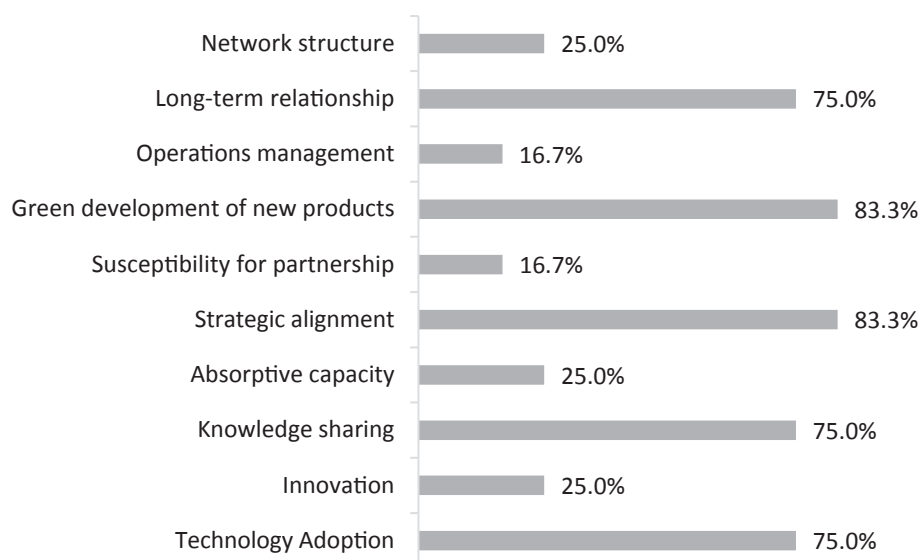
Graph 1 – Results of the criteria comparison matrix



Source: Elaborated by the authors

The values found for the Eigen vector have direct physical significance in the AHP. It determines the participation or importance of that criterion in the total goal result (Vargas, 2010).

The steps described for the definition of the Eigen vector of the criteria also occurred for the alternatives. Therefore, the alternatives referring to the same criterion were compared to each other. From the scores assigned by the manager, it was possible to find the Eigen vector for each alternative (Graph 2). The inconsistency ratio for all was 0, thus the matrix can be considered consistent.

Graph 2 – Results of the alternative comparison matrix

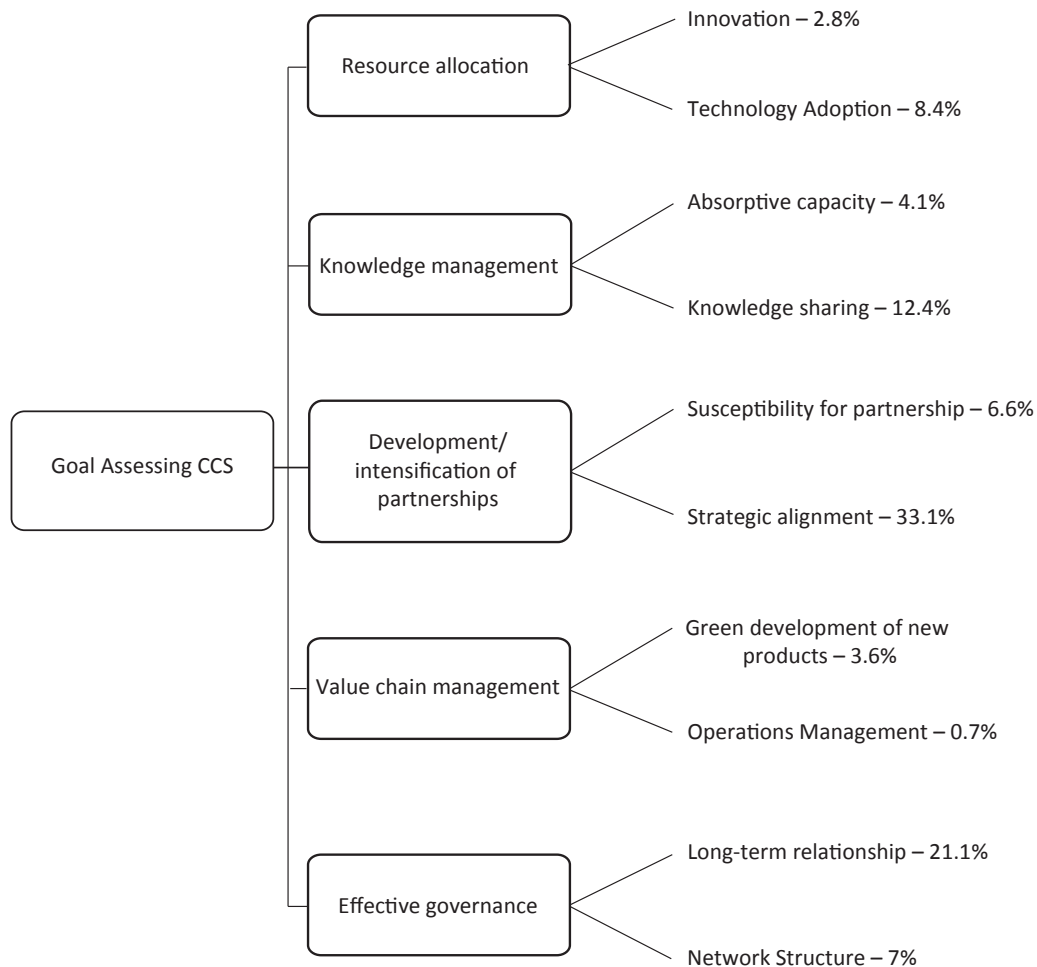
Source: Elaborated by the authors (2017)

For the hotel managers to have information to make decisions about which alternatives should be improved to expand CCS, it is necessary to estimate the overall priority (Figure 2). This is determined through the multiplication of the alternative Eigen vector (Graph 2) by the Eigen vector of its respective criterion (Graph 1).

Analysis and discussion of results

According to the results shown in Graph 1, the development of partnerships is the main contributor to the development of CCS by the hotel, corresponding to 39.7%. Through partnerships, companies can leverage resources and knowledge from other actors, access external sources, absorb knowledge and critical resources from their partners, broaden their initiatives to adopt strategies aimed at sustainability, increase consumer satisfaction, exchange information, exchange values and solve problems (Van Hoof & Thiell, 2014). The study showed that the cluster hotels have a relationship of trust and exchange knowledge because they have the common objective of promoting João Pessoa. Through this partnership, initiatives related to the environment begin to emerge, implying strategies and actions aimed at sustainability, from the perspective of NRBV.

Effective governance is the second most impactful criterion. Effective governance implies a reduction in transaction costs within the network through governance mechanisms (Capaldo, 2007). In the study case, it was found that the hotel cluster is composed of long relationships, which facilitates the knowledge sharing and network management, through the adoption of governance information mechanisms, especially from the relationship trust. In this context, the importance of knowledge management was highlighted, because, according to the interviewee, to grow and expand actions with a focus on sustainability strategies, it is necessary to learn to share; therefore, the exchange of interorganizational knowledge is essential.

Figure 2 – Overall priority

Source – Elaborated by the authors

The ability to allocate resources is related to investments in specific relationship assets that are fundamental to the generation of relational incomes (Dyer & Singh, 1998). These investments result in better coordination and adjustment through the boundaries of the partner companies involved, requiring resource allocation processes directed towards the partner companies, as well as for their own resources (Czakoń, 2009). In the study case, this capacity had low representativeness, as the interviewee reported the company's low initiative for investment in specific relationship assets focused on clean technologies and green innovation, compromising, thus, the adoption of strategies aimed at sustainability according to the NRBV perspective.

The value chain management is the criterion of lower impact, since there was no joint development of products or services focused on sustainability, although there are some operations in the company focused on sustainable initiatives, as the waste collection in all rooms. However, the management of these operations is not jointly developed by the partners (Czakoń, 2009); thus, this criterion and the capacity to allocate resources need to be prioritized in the company's strategies, aiming at achieving better performance in the CCS.

In Figure 2, the most important alternative was the strategic alignment in consonance with the most influential criterion: the development of partnerships;

since the strategic alignment is a sub-attribute (or alternative) that positively contributes to the development of partnerships. Therefore, the alignment ensures that the partners have among their objectives the implementation of sustainable initiatives in the short, medium, and long term.

The alternatives that least influenced (Figure 2) were the operations management, innovation, the green development of new products and the absorptive capacity. Among these, the values obtained for innovation and for the green development of new products are justified, because the company is not focused on the creation of technologies or sustainable products. The literature indicates that innovation and the green development of new products are related to the product management strategy, presented by Hart (1995). This strategy is related to some areas such as operations management, marketing, and strategy, therefore requiring coordination in intra-organizational and inter-organizational relationships (Hart & Dowell, 2011), being difficult to be implemented by the organizations, as seen in the study case. In particular, operations management ensures that the objectives of the network focused on sustainability are associated with the operations developed in the companies; and the absorptive capacity ensures that the company learns through knowledge and information shared between partners. Both need to be intensified by the organization, in favor of adopting strategies that aim at sustainability.

FINAL CONSIDERATIONS

Nowadays, sustainability is a competitive differentiator for companies, as consumers are increasingly demanding the insertion of sustainability to the products or services offered, especially in the tourism segment. Thus, organizations have resorted to the development of interorganizational networks to obtain benefits associated with sustainability, such as the development of CCS.

This article focuses on the study of collaborative capacities associated with sustainability and concludes that to develop this type of capacity, it is necessary to evaluate aspects such as resource allocation, knowledge management, development and intensification of partnerships, value chain management and effective governance (Gonçalves, 2018). Therefore, the joint work of companies can expand the potential of the value created in interorganizational relationships focused on sustainability.

The literature reports the importance of collaborating for sustainability, but this was not the focus of the authors. In addition, no studies that sought to quantify CCS by means of mathematical modeling were found. As such, this study shows some theoretical and practical contributions. First, it sought to cover the deficiencies presented after obtaining numerical results for the CCS assessment of a hotel that operates in the tourism cluster in Paraíba, using the AHP tool. Second, the results in Figure 2 and Graphs 1 and 2 showed information that could help hotel managers to analyze which attributes and sub-attributes should be improved to increase the potential to collaborate for sustainability, contributing to the sustainability objectives and to the correct decision making. Finally, the study contributes to the tourism literature, since most of the research in the area has shown interest regarding the environmental issues, identifying indicators of

sustainability, but few studies focus on the necessary capacities for organizations to implement sustainable strategies (Mihalic, 2016; Pace, 2016).

The study has some limitations, such as the tool used. In the AHP, each element of the hierarchy is considered independent of others and sometimes the attributes have interdependence among them, which need to be considered in the analysis (Saaty & Vargas, 2012). Thus, other multicriteria tools can be used to relate all possible influences between the attributes and among the sub-attributes, for example, the ANP (Analytic Network Process). In addition, other studies may use more specific CCS attributes and sub-attributes according to the assessment context.

Another limitation is the method, since the study case prevents the generalization of results. Although the study case in this article has been used to test the CCS assessment tool, future research can test the tool with other companies of the cluster to perform a comparative analysis of the results found. In addition, the conduction of surveys with specialists in the studied cluster can expand the generalization level of the results. Therefore, it would be possible to understand which CCS attributes or sub-attributes are most important to the interorganizational network.

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