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ORIGINAL RESEARCH ARTICLE

Triple helix stakeholder visions for smart tourism

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ABSTRACT

Objective: This research article seeks to analyze how academic progress in the field of tourism places value on the need to adopt technological advances in the framework of development for a sustainable future, taking this into account, this research studied the discourse of the actors involved in the triple helix in the face of smart tourism and its implementation in Colombia. **Method:** The methodological strategy contemplated a hermeneutic and inductive perspective, from the Grounded Theory that interpreted the discourses of the University, the Company and the State facing the phenomenon of interest, the information was codified in the Software. **Findings:** As a result, gaps and key factors that would allow, from the perspective of the groups approached, the success of smart tourism strategies were obtained. **Conclusion:** The technological appropriation of the Colombian tourism sector reveals a gap especially in the capacity to generate an intelligent offer in relation to the experience perceived by the consumer. Likewise, the discourse shows that, within the need for integration of the triple helix, building an intelligent service for the value proposition is one of the most important challenges for the sector and therefore a lag that must be jointly intervened at government, academic and business levels.
Keywords: tourism; business; university; triple helix; intelligence; state

1. Introduction

According to data reported by the World Tourism Organization-UNWTO, tourism represents 10% of world GDP and 7% of international exports, with a tourist growth rate for 2017 of 7%, of which, 6% corresponds to the Latin American region that translates into the net inflow of 710 billion US dollars to Spanish-speaking economies.

Colombia as of 2017 represented 1.5% of the share of income generated worldwide thanks to tourism, ranking third in the region after Argentina and Brazil. However, 2018 marks an important milestone in this sector of the country due to the fact that hotel occupancy (56.8%) presented a positive behavior denominated as the highest recorded since 2005 by the National Administrative Department of Statistics-DANE, generated by the entry of 4.3 million non-resident visitors[1,2].

This is how the analysis in this area has been carried out in a fragmented manner, since it has been studied from the perspective of the industry[3] or

from the region[4], ignoring that sustainable and long-term development should be reviewed from the visions of all the actors that can contribute to it[5-7]. Since the analysis carried out by the different agents that converge in this sector (academia, business and the State), is indispensable for the management of tourist destinations and the development of a joint work that allows the construction of a value offer and the exercise of marketing associated with a territorial brand.

This is based on the need to provide sustainability in every sense to destinations, taking as a reference a hyperconnected and increasingly informed consumer and an educational system that, in the face of industries 4. 0 requires deep reflections, beyond the vocational[8], or from the design and transcendence of the experience[9], especially when the literature shows that from every perspective of tourism management, it is necessary to move towards smart tourism mediated by technology[10], a matter in which the role of marketing is fundamental[11].

The literature related to the triple helix model as a promoter of innovation in societies through the creation of capabilities and strategic alliances[12–14] has been validated from different perspectives according to research interests. However, for smart tourism it has been approached independently for each of the perspectives[15-17], even when there are some integration efforts that are made for tourist experience analysis[11,18–21].

Additionally, the marketing agenda, especially in emerging countries, must migrate towards intelligence[22], this concept that involves the technological management of the business from the emerging forms of Information and Communication Technologies, to provide value propositions according to the needs, not only of consumers, but giving relevance to all stakeholders, which implies thinking the industry and the region, from competition, collaboration, community and academia.

Dorcic, Komsic and Markovic[23] recently conducted a review of the state of the art of scientific

literature on mobile technologies and especially applications that promote smart tourism; however, it is clear that technology is a medium that does not work without the cohesion and participation of the university, the company and the State, in addition to the community, which although it may have a role of adopter, is a participant in the positive and negative aspects of this type of progress.

Likewise, although the literature is aware that the triple helix is making developments for smart tourism[18,24], there is a gap to account for how the university, companies and the state see these new forms of reality and what are the challenges they see for the implementation of it, in the framework of an emerging country like Colombia.

In relation to the above, it is evident the need to go beyond the functionality of technology and see the perspectives of the actors who must cooperate, the triple helix, in the search for developing tourist destinations. Consequently, this research aims to review from the discourses of academia, industry and government, the gaps and key success factors in the implementation of new technologies for Colombian tourism marketing, within the framework of the Smart cities trend.

2. Conceptualization and previous studies in the field of smart tourism

As the literature indicates there is a recent interest in generating smart destinations or smart tourism, given not only the emergence of the concept, but of enabling technologies for its provision for this activity[25,26], likewise the purpose of such intelligence is to provide better experiences to tourists[20,27], without ignoring the need for sustainability of the destination, a matter that involves the community that inhabits the territory subject of visit[28,29].

Similarly, the literature finds relevance in the concept of smart tourism, such that, it is seen as a way to operationalize sustainable tourism[26,29,30], likewise, its meaning gives relevance to the involve-

ment of the government, the industry and the communities that reside the tourist territory[16,28]. Smart tourism, also comprises service management and marketing issues, that is managing the experience of tourists[31,32]. However, it is agreed that smart tourism as a concept must evolve and for this there is a lack of consensus in the literature for its delimitation[33].

Thus, the concept of smart tourism has an inherent link to technological developments in the field of the Internet of Things, likewise according to the literature the notion is directly related to competitiveness, economic and sustainable development for tourism activities[34–36].

However, while there is no consensus in the literature on the precise definition of the concept of smart tourism, this research agrees with the following delimitation:

A trend to account for the incremental reliance by tourism destinations, their industries and their tourists on emerging forms of Information and Communication Technologies, which allows transforming large amounts of data into value propositions[37].

In this sense, although authors such as Mandic and Pranicevic[38] make contributions on the impacts of the actors involved in the supply chain for smart tourism, their work remains in the analysis of the content of the documents published on the subject, without performing empirical validation, relying on those involved as informants. Likewise, Hua[16] proposes that platforms for smart tourism should involve the government, the industry and the community, ignoring the relevant role in this area of the academic sector.

Moreover, while the literature has made significant progress in terms of how to achieve advances towards smart tourism from technologies such as artificial intelligence[8], multi-agent systems[39], Blockchain[25], grid and cloud computing[40–42], evolutionary algorithms[43] and Internet of Things[44–46] or even virtual reality[47,48], it is still necessary to review the

challenges of smart tourism, either for a city or a region, since despite some efforts to compare[49] no consensus is needed to do so.

Similarly, although previous studies have taken into account the concept of governance for this area [50], it has not been approached or thought from all the possible actors involved in the process as it can be done from the perspective of the triple helix.

In this sense, in Liburd, Nielsen and Heape[51] there is a co-design initiative for the field of smart tourism, which does not transcend beyond the relationship between the industry and the consumer. Likewise, with Hernández-Martín, Rodríguez-Rodríguez and Gahr[52] the role of government is put in value, but insists on the need to address this issue from plural perspectives that participate and have an impact on it.

Likewise, a case study in the Italian context presents a project that accounts for the relevance of integration between the tourism industry, the university and the State for the consolidation and achievement of a regional strategy for tourism and smart regions[24]; however, each context is particular and the conclusions of this area could not necessarily be replicated in other countries, much less if they are emerging. Thus, in a review to Ruíz, Bohorquez and Molano[53] it is evident that they make a relevant approach to the development of smart tourism in Colombia; however, although they approach it from the concept of the Internet of things, they do not see it from the perspective of the necessary integration of the actors involved in the implementation and appropriation of technology.

3. Methodological aspects

This research declares that it assumes pragmatism[54,55] as a philosophical position, inductive[56] as an approach, grounded theory[57] as a strategy, in the previous one the information was approached with the method of discourse analysis.

Given the above considerations, the research was organized in four stages, (I) literature review, (II)

design of the methodological strategy to approach the discourse, (III) meeting of the perspectives of the agents that make up the triple helix and (IV) processing and analysis of the information shown in this document. It is relevant to indicate that stages (I), (II) and (III) were carried out simultaneously and in accordance with the needs of the theoretical sampling exercise, as indicated in the methodological references inherent to the nature of the research problem [57–59].

It is relevant to point out that the work carried out was characterized for being cross-sectional, and the information was taken from the speeches of a forum, which was held for the purpose of this research, in the framework of a meeting in which members of the triple helix were invited, who were asked guiding questions to discover the gaps and key factors for the development of smart tourism in Colombia, after accepting the treatment and analysis of the information.

Thus, once the information was transcribed and codified, the families and possible factors that enclose the perspective of the agents that make up the triple helix with respect to the role that new technologies have or should have in the development of mar-

keting for the Colombian tourism sector were identified, and the information was analyzed hermeneutically in the Atlas.ti software.

4. Results

Following the protocol presented by Strauss and Corbin and Flick[60] for open and axial coding and the generation of families, six (6) axial codes were obtained, which are organized into two (2) families called "Key gaps" and "Key factors". Figures 1 and 5 detail the main findings found from the discourses analyzed in the actors of the triple helix. Next, the "Key Gaps" family is presented, which has three axial codes: "Triple Helix (U-E-G) + Communities", "Intelligence" and "Challenges"; and after that, the "Key Factors" family, composed of "Tourism", "Consumer" and "Marketing".

4.1. "Key Gaps" family

The family named "Key Gaps" represented in **Figure 1**, has linked axial codes defined as "Triple Helix (U-E-G) + Communities" with 23 foundations and 6 connections {23-6}["Intelligence" {70-8} and "Challenges" {6-5}.
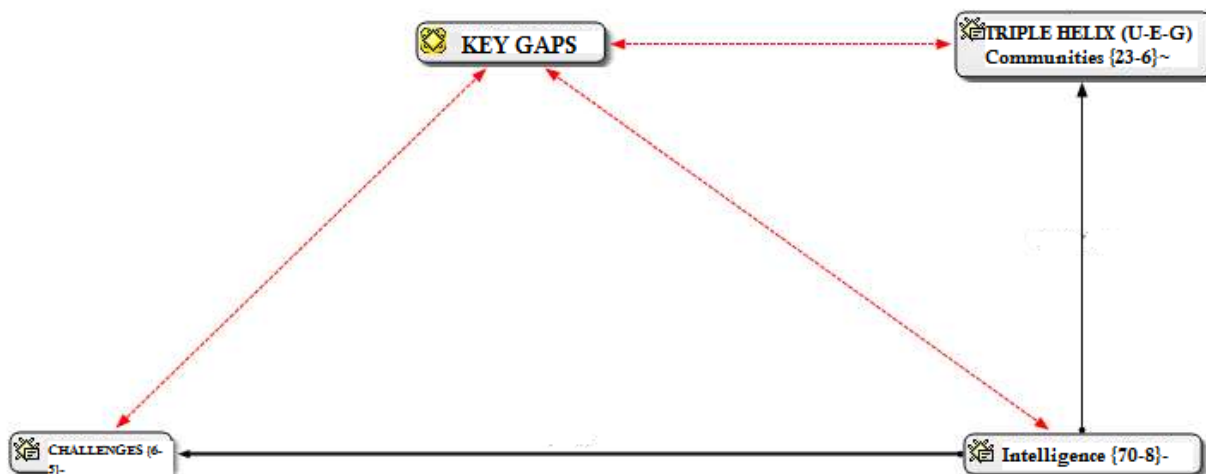

Figure 1. Family of codes "Key gaps".
Source: Own elaboration based on hermeneutic analysis of discourses.

The first axial code of the "Key Gaps" Family is "Triple Helix (U-E-G) + Communities" {23-6}, shown in **Figure 2**, which includes the codes "Intelligence" {70-8}, at the same level, as well as "Government" {26-7} and "Tour Operator" {14-8}, at a

lower level, which show a common association with "Information exchange" {7-8}, except for "Intelligence" {70-8}. It should be noted that "Tour Operator" {14-8} is part of the code "Regional Brand" {565} which together with "Digital Economy" {10-

5} are directly associated with the "Triple Helix (U-E-G) + Communities" {23-6}; likewise, "Digital Economy" {10-5} is associated with "Tour Operator" {14-8} and "Information Exchange" {7-8}. Following are some of the textual discourses of "Triple Helix (U-E-G) +Communities" {23-6}, "Information Exchange" {7-8} and "Digital Economy" {10- 5}:.

"[...] There is usually more than one tripartite that generates that territory, a quadruple proposal that encompasses the private sector, academia, the public sector and civil society [...]" Speech 5

"[...] We are making a transfer to something called omnichannel, that is, connecting all the channels into one so that we can have all the information regardless of whether the client contacts us through social networks, by phone or by mail [...]" Speech 6

On the other hand, the axial code "Intelligence" {70-8} exposed in **Figure 3** as part of the "Key Gaps" Family, is part of the "Digital Transformation" {19-5} and which in turn contains the lower level code "IoT"{15-4}. It should be noted that "Big Data" {19-3}, "Digital Marketing" {21-4}, "Tourism" {44-6} and "Technological Adoption" {15-7} are associated

with "Intelligence" {70-8}, some of these will be developed in the section corresponding to the axial codes related to the "Key Factors" Family. In the following, some of the textual discourses of "Intelligence" {70-8} are presented:

"[...] Both security, roads, education and tourism must be digitally intelligent in order to meet today's challenges [...]" Speech 4

"[...] It is often confused with the availability of technology, but intelligence goes beyond data collection. Intelligence is in the decisions that are made from the information and data that are obtained [...]" Speech 2

It is important to highlight that within the axial code "Intelligence" {70-8}, there is "Technological Adoption" {15-7}, which has a causal relationship with "Government" {26-7} given its relationship with "Digital Transformation" {19-5}, "Digital Economy" {10-5} and "Information Exchange" {7-8}. Likewise, this code is associated with that of the "Consumer" {18-7} and the "Tour Operator" {14 -8}.
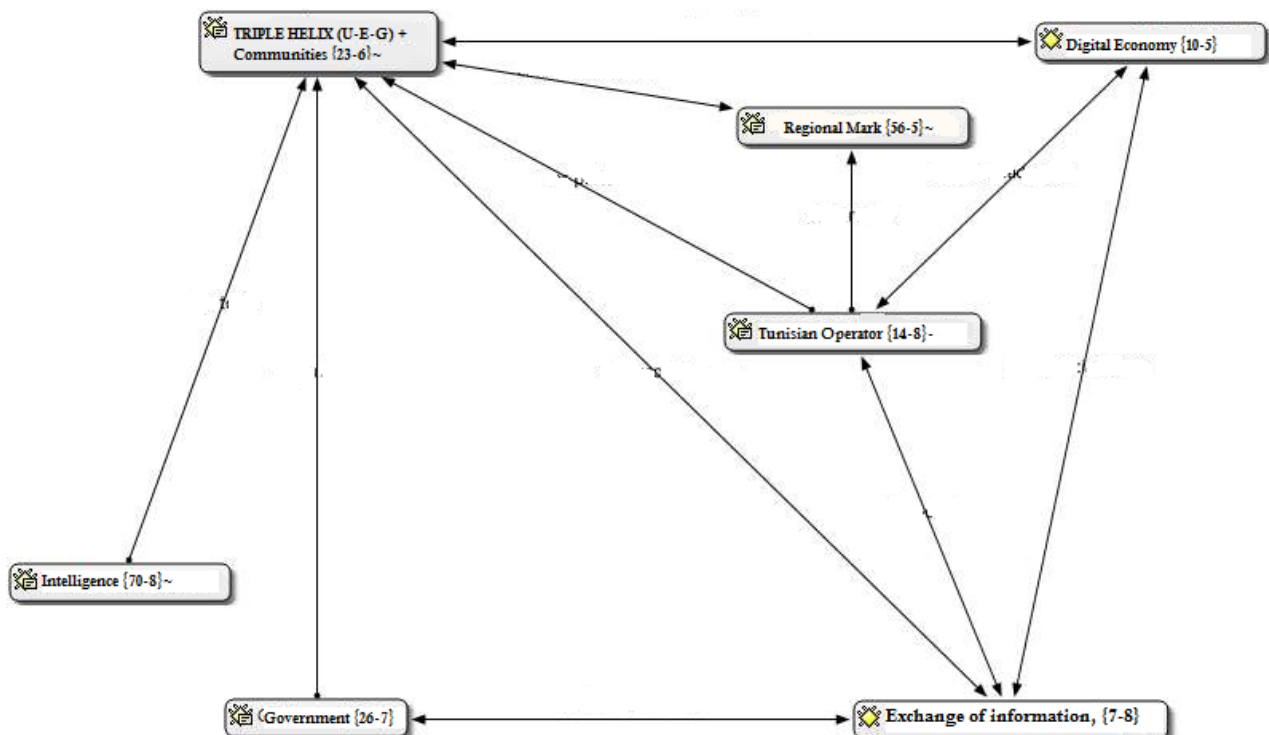

Figure 2. Axial code from the "Key Gaps" Family of codes: "Triple Helix (U-E-G) +Communities".

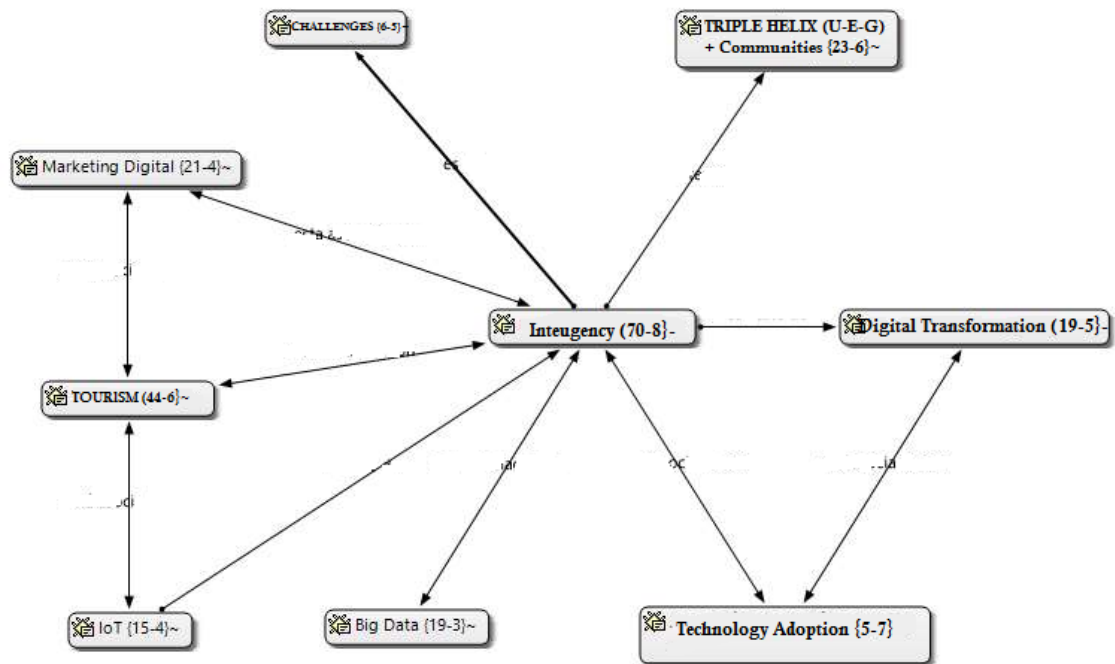Source: Own elaboration based on hermeneutic analysis of discourses.

Figure 3. Axial code of the "Key Gaps" Family of codes: "Intelligence".
Source: Own elaboration based on hermeneutic analysis of discourses.

Finally, the third axial code of the "Key Gaps" Family corresponds to "Challenges" {23-6}, which is described in **Figure 4**; this is characterized by not having specific associations but by establishing four challenges defined in the codes "Skills for digital environments" {201}, "Intelligence" {70-8}, "Infrastructure" {17-3} and "Regional Brand" {56-5}. Against this, some textual discourses are presented that are related to "Skills for digital environments" {201} and "Regional Branding" {56-5}:

"[...]The digital divide of the future is going to be established between citizens who have digital skills and those who do not have digital skills [...]" Speech 1

"[...]The issue of digital exclusion, just as in the labor market people were excluded for not knowing how to read and write, now they are excluded for not being aware of the digital world [...]" Speech 2

"[...]In general, what we are doing from the department and what we are looking for is to generate the positioning of the brand-region of Cundinamarca and, as far as possible, to induce that strategic digital marketing also becomes a sales channel for all our allies in the future [...]" Speech 4

Additionally, it is worth mentioning that as a result it was found that "Information exchange" {7-8} is part of the code "Challenges" {23-6} but not a specific one. Below are some textual discourses related to "Challenges" {23-6} and "Infrastructure" {17-3}:

"[...]Improve infrastructure for connectivity for users who do not have access to mobile data [...]" Speech 3

"[...]Provide the city with the infrastructure required by the city and the inhabitants of Bogota, we cannot have applications, digital content, platforms if our cell phones do not work, if we do not have fiber optic networks, if we do not have high-speed Internet in the city [...]" Speech 1

"In Colombia we are lagging behind in this aspect. For example, there is a lot of insistence on infrastructure, on expanding wifi zones, which is important but not the most important thing [...]" Speech 2
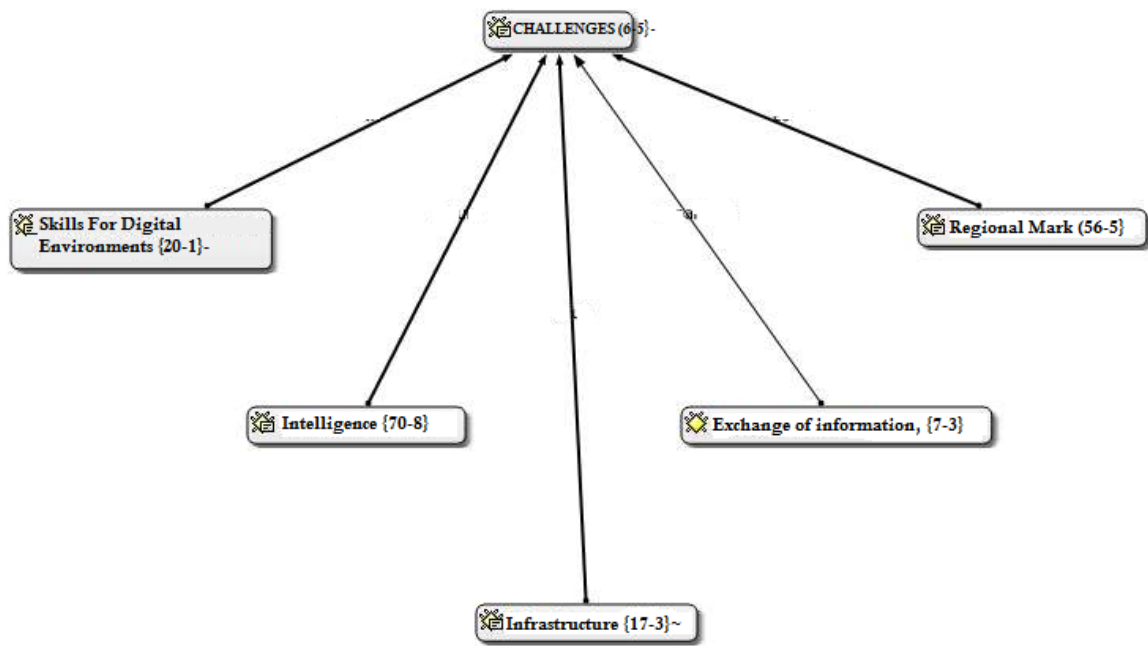
Figure 4. Axial code from the "Key gaps" Family of codes: "Challenges".
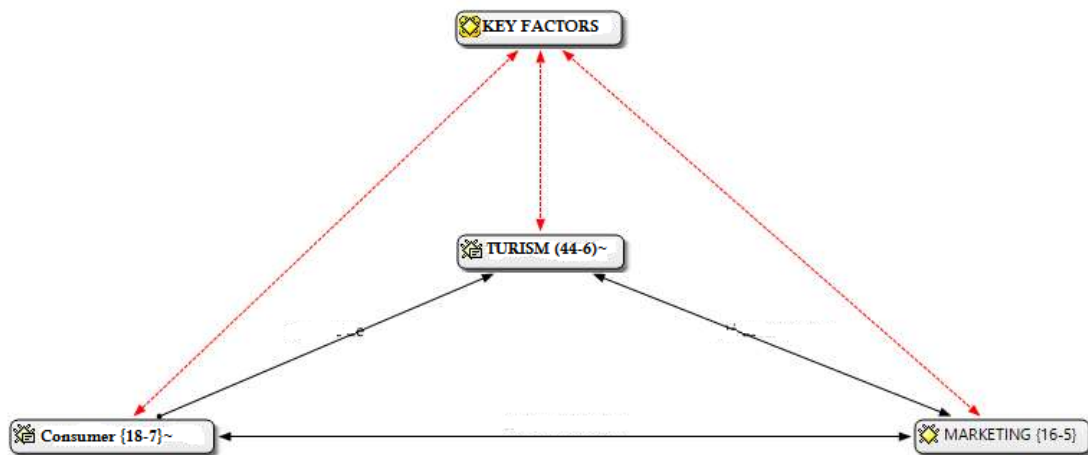Source: Own elaboration based on hermeneutic analysis of discourses.

Figure 5. "Key factors" family of codes.
Source: Own elaboration based on hermeneutic analysis of discourses.

4.2. Family "Key Factors".

The family called "Key Factors" illustrated in **Figure 5**, has the axial codes defined as "Tourism" {44-6}, "Consumer" {18-7} and "Marketing" {16-5}.

The first axial code of the "Key Factors" Family is "Tourism" {44-6}, detailed in **Figure 6**, from which it can be seen that it contains the axial code "Consumer" {187}, of the same level and family, while it is associated with "Intelligence" {70-8},

"IoT" {15-4}, "Marketing" {16-5}, "Digital Marketing" {21-4} and "Regional Brand" {56-5}. Following are some textual discourses related to "Digital Marketing" {21-4}, "Regional Brand" {56-5}, "Consumer" {18-7} and "IoT" {15-4}:

"[...] Likewise, airlines, travel agencies, hotels, the offer at tourist level is huge, then, the second challenge is to stand out and be visible in that sector [...]" Speech 7

"[...] We are promoting digital tourist stops that

not only consist of places to take pictures and get to know a destination, but at the same time you have the possibility of connecting and downloading the tourist offer of the municipalities [...]" Speech 4

"[...] Georeferencing (IoT), ranking, being able to comment and inquire about different tourist offers allow tourists' decision making to be much more effective [...]" Speech 4
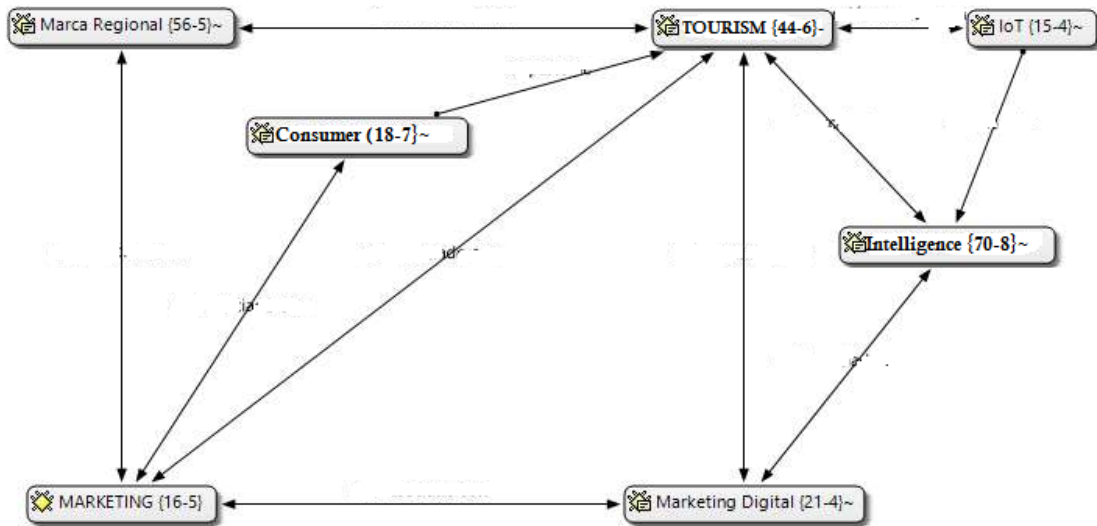

Figure 6. Axial code of the "Key Factors" Family of codes: "Tourism".
Source: Own elaboration based on hermeneutic analysis of discourses.
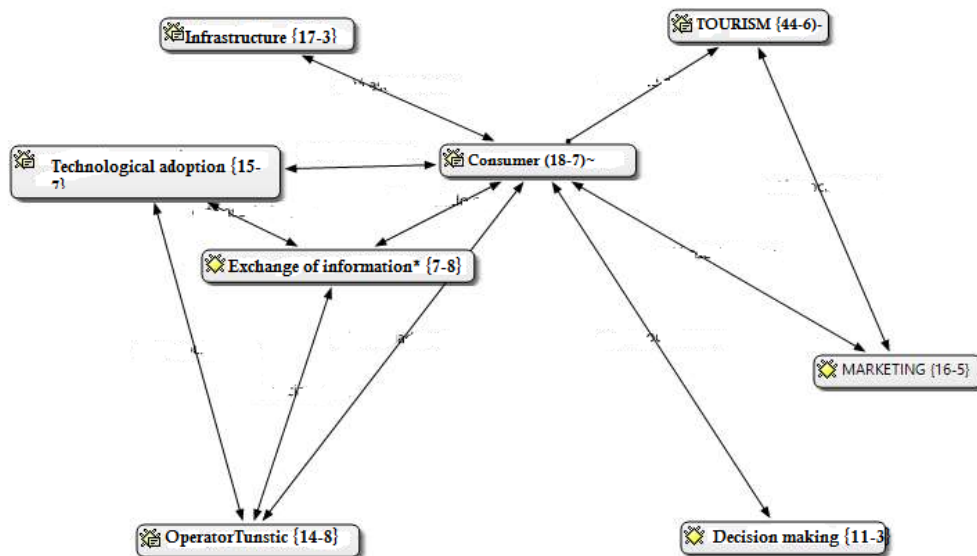

Figure 7. Axial code of the "Key Factors" Family of codes: "Consumer".
Source: Own elaboration based on hermeneutic analysis of discourses.

In sequence, **Figure 7** shows the second axial code of the "Key Factors" Family corresponding to "Consumer" {18-7}, which omitting the previously mentioned relationships is associated with "Technological Adoption" {15-7}, "Information Exchange" {7-8}, "Tour Operator" {14-8}, "Infrastructure" {17-3}, "Marketing" {16-5} and "Decision Making" {11-3}. Following are some textual discourses re-

lated to "Consumer" {18-7} and "Technology Adoption" {15-7}:

"[...] We see consumer behavior reflected in the fact of giving real time response, it is necessary to give immediacy to the information provided and the promotion carried out ...Strengthen tourism providers and operators, because those who provide the services are them, and those who provide such services

are those who allow tourists to take away a good perception [...]" Speech 4

"[...] We can observe the change that technology has undergone, going from being a tool to a content generator that allows the production of knowledge regarding trends and preferences that consumers have [...]" Speech 4

Finally, **Figure 8** shows the relationships of the axial code "Marketing" {16-5} of the "Key Factors" Family, among which "Artificial Intelligence" {7-2} can be highlighted as a cause of "Marketing" {16-5} in the potential development of smart cities. Likewise, an association can be established between the axial code in question with those of "Tourism" {44-

6}, "Digital Marketing" {21-4}, "Regional Brand" {56-5} and "Consumer" {18-7}. Some of the textual discourses of Artificial Intelligence" {7-2} are presented below.

"[...] Marketing is one of the sectors that has benefited the most from the topic of artificial intelligence [...]" Speech 2

"[...] We are going to start exploring artificial intelligence methodologies such as Watson (IBM), to have access to the information and the journey of each traveler and then reach them with segmented and personalized offers for each of their needs [...]" Speech 7
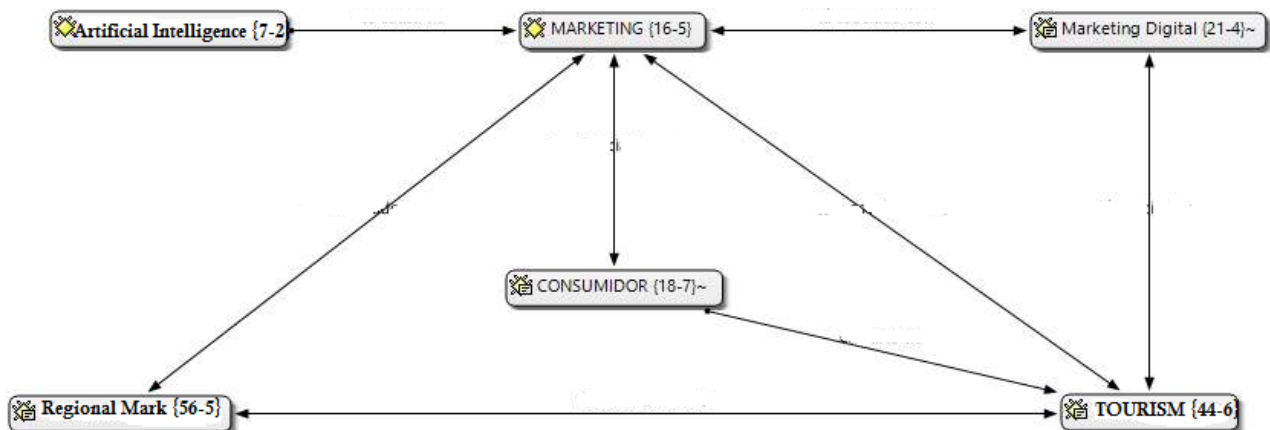

Figure 8. Axial code of the "Key Factors" Family of codes: "Marketing".
Source: Own elaboration based on hermeneutic analysis of discourses.

5. Conclusions

The development of the Internet coupled with globalized technological advancement together with innovation systems, have made it possible to generate new value propositions in different markets, within which tourism is included[61]. For Hua and Koo et al.,[16,17], the incorporation of the concepts of Smart cities or Smart tourism in the literature is no longer an ideal construct but rather a development based on new technologies such as big data, data analytics and other data mining techniques from mass media, which allow the construction of platforms for all the agents in the sector, with which to generate forecasts for the management of the territorial brand.

In this order of ideas, the results obtained at the moment show that the technological appropriation of the Colombian tourism sector reveals a gap, especially in the capacity to generate an intelligent offer in relation to the experience perceived by the consumer. Likewise, the discourse shows that, within the need for integration of the triple helix, building an intelligent service for the value proposition is one of the most important challenges for the sector and therefore a lag that must be jointly intervened at the governmental, academic and business levels.

Likewise, the smart feature is designed for the exchange of information between the government and tourism operators for the development of a regional brand and the construction of experiences regardless of the channel through which contact is

made with the customer. Similarly, the above relationship is validated by concluding that the digital transformation provided by the implementation of the Internet of Things, as well as the use of digital marketing strategies, big data and data mining for decision making, allow the development of smart destinations around the interaction between tourism management and consumer experience.

Based on the above, it cannot be expected that the offer is intelligent if there has not been a process that builds skills for digital environments for all agents; which start from a need for infrastructure (connectivity) available and the adoption of new digital technologies within tourism management. In view of this, it is recommended to include in future studies the perception of telecommunications providers as a variable that determines the development of smart destinations, as these are the operators of the connectivity of the national territory in the country.

Similarly, the results validate the premise of Kuanrong and Guili[40] since, even though national tourism has fallen short to meet consumer needs, the implementation of technology in the value chain in order to provide a new experience, must be intertwined with a territorial brand marketing strategy that responds to market demands.

Finally, as limitations, it can be stated that the vision of the government requires a holistic and integrative analysis between the national, regional and local levels. It is therefore proposed that future research should include a greater number of participants distributed proportionally to the three (3) levels mentioned, in order to represent and analyze the vision of the State with regard to public policy in tourism management.

Conflict of interest

The authors declare no conflict of interest.

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