COMPLEMENTARITY MODEL OF THE ORGANIZATIVE SYSTEM AMONG MICRO, SMALL AND MEDIUM-SIZED TOURIST ENTERPRISES OF MEXICO, IN A CHANGING ENVIRONMENT

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ABSTRACT

The performance of tourist micro, small and medium-sized enterprises (MSMEs), in Mexican tourist destinations, tend to be slightly efficient before disturbances of the environment. In a globalized context, these organizations are not on equal terms with respect to large companies, what puts at risk their life cycle. This idea allows to address a local problem with high implications in the Mexican context through the Systemic method in order to propose effective and adaptive actions. This paper presents the design of a model based on the beneficial adaptation of heterogeneous attributes among MSMEs. The Soft Systems Methodology (SSM) allowed to integrate factors and actors involved in the problem situation and subsequently generate a construct, which was contrasted using Analytical Hierarchy Process (AHP). As a result, it was obtained that systemic complementarity is a framework that allows to integrate local collaboration opportunities and increase responsiveness to the environment and extend the permanence of the companies. In addition, relations raised in the construct could improve gaps among these organizations from collective learning without neglecting the development of individual capacities.

Keywords: AHP, Complementarity, Soft Systems Methodology, Systems Science, Tourism MSMEs

INTRODUCTION

Tourism, as an area of study, has been treated by several authors in different contexts and disciplines, trying to comply a basis for its development as a scientific discipline. Despite their efforts, is evident the increasing disintegration of the epistemological basis, even though it has been highlighted the perception of being a 'commercial activity', different disciplines such as: Economics, political science, geography, sociology, psychology, anthropology and management, end up in a varied knowledge which increases its incomprehension and subjectivity (Tribe, 2010). Monterrubio (2011) reinforces this idea by saying that tourism has experienced many problems to be recognized by certain

established disciplines due to the dispersion of monodisciplinary texts that exclude components and essential interrelations for it formalization.

In the practical context of tourism the Micro, Small and Medium-sized enterprises (MSMEs) integrated into this sector, are identified as essential components for its development and dynamic, contributing to the improvement and consolidation of tourist destinations. In Mexico, the value of these companies is centred in its initial stage or entrepreneurship due to the amount of investment that altogether generate, leaving the consolidation and development process to improvisation and imitation of business models that little can be adapted to their conditions. At the level of a tourist destination, ensures the opening of a certain number of MSMEs, but its dynamism and developments within the sector is neglected. For the reason, that its almost null strategic management increases internal entropy, affecting the response capacity of the tourist destination and leading them to chaos.

The contributions from the social sciences are very scattered, emphasizing economic and administrative interventions, same that allow to identify various actors and variables for their study, but their contributions are far from concluding on the need to exert an integrative paradigm, reducing tourism to linear process between product and actors as facilitators, oriented on the study of factors in a tourist destination such as image, profitability and adequate professional staff capacity; relevant factors to increase productivity (Muñoz de Escalona, 2010). Therefore, its research efforts has been centred in aspects such as growth and technological development of the firms and economic sectors in order to adapt them to new environment requirements (Núñez et al., 2015; WEF, 2015). In essence, the inherent flaw in this approach is that it generates strategies, standards and organisational conditions for technological development (innovation) resulting out of reach for MSMEs in practice.

In this paper collaboration was established with organisations in Bays of Huatulco, Mexico. Having said that, it clarifies that mostly the established MSMEs in that tourist destination, have not been able to achieve benefits over time, due to variations in the environment and monopolistic competition accentuate their limitations, they are less aware of their capacities and systemic dimensions (Herrscher, 2008), that increases their dependence on other businesses and raise the costs of their services. The above, establishes a fragmented perception of a destination (Florek & Insch, 2011), with scarce skills and attributes that grant a good experience for tourists.

The previous, recognizes the lack of complementarity between their own economic units and the tourist system, therefore to react effectively to the tourists demands it is not enough to detect the emerging properties in the micro or macro level, but to understand the new state generated for both levels. The different models of business relations among Mexican organisations exhibit flexibility with respect to the government decentralization and relation with the environment, but in essence, there still turn out to be centralist and hierarchic configurations derived from Ford's model taking as an essential feature the work chain and specialization or internal technical processes (Alburquerque, 2004), looking for homologate and reduce the company to standards that grant it access to the international

market. The start-up in MSMEs underlines the imitation, and lack of learning through these models. The imitation dependence inhibits to identify individual and groupal conditions to adapt to the context, because the organisation is restricted to mimic the model by isolating itself from the environment variation, neglecting the emergence of new capabilities. In addition, the models should transcend the synthesis of primary components (management-organisation) and the global existence of the tourist MSMEs.

This paper proposes an integrative model that emerges from systemic methodologies, whose transformation part from the systemic complementarity, the usage of variety amplifies the ability to transcend in a complex environment. Therefore, a construct based on complementarity, seeks for different strengths with respect to several trends, the development of individual and collective capacities that will grant development in proper ways to increase variety before problems that arise (Jackson, 2003).

SYSTEMIC INTERVENTION

The Total Systems Intervention (TSI), puts into practice the commitments attached to critical thinking through three stages: creativity, decision and implementation. Applying those, the first stage allowed to identify aspects that impact reality in tourist MSMEs derived mainly their disorganisation and inability to adapt and respond to the environment demands. This first approach leaned in context problem grid and the System of Systems Methodologies (SOSM), and the problematic situation in this paper it was classified as a complex-coercive problem, its treatment requires methodological complementarity to increase effectiveness.

Its second stage led to select the proper intervention to provide solutions and the system under study achieve learning, for that reason the Soft Systems Methodology (SSM) and the Analytic Hierarchy Process (AHP) were chosen. The first one integrates subjectivity present in tourist MSMEs and allowed to elaborate a rich picture that derives in a conceptual model.

Methodological approach

The SSM, articulates a learning process that takes shape from the intervention of involved actors. The flexibility of its application facilitates the use of only the necessary stages, through its development there were detected certain pathologies that affect the behaviour of tourist MSMEs in the selected destination, those pathologies are classified as follows:

Individual: on not give them stability, people included into these companies, diminish their confidence towards the organisation (Núñez *et al*., 2015), this impacts their performance and interaction with tourists. In this case, the idiosyncrasy as a predominant condition it is assumed that can overcome the training and educational level of people. At the same time, technical skill deficiencies were identified.

Group: the interaction among people few identified with the company, negatively impacts the organisations involved; on the other hand, not to get involved with members of other companies limits the acquisition of information and diversity, this cause lack of knowledge about the ways to confront problems and little rational decisions, without a sense of pluralism that generates a creative intellect for companies (Mazzocchi, 2016).

Organisational: the previous pathologies are inherent to this level, which attaches lack of credibility in the capabilities and knowledge of people that integrate the operational level and generally to the organisation. In addition, the usage of techniques such as authoritarianism, communication and insufficient and late information that in future relates to redundancy of actions, depletion and progressive destruction of the tourist MSMEs conglomerate, described as asphyxiation of the system due to changes and information within its environment, involving an overload of information that increases entropy in the system.

The progressive disruption of communication lines among levels of recursion, leads to the loss in coherence and reaction capacity of the same (François, 2004). Confusion in coding and decoding leads to progressive loss of interactions between subsystems or members of the systems. Incompatibility of purposes in different recursion levels.

For the above, the following root definition is established: a model that through systemic complentarity among tourist MSMEs, is capable of eliminate the shortcomings to achieve a status of autonomous *exelisis*. And that new order, direct them to their complexification and maintenance in a viable equilibrium with the tourist destination.

The transformation process proposed to counter the pathologies in the system was evaluated through the CATWOE mnemonic, same that ensured the key characteristics that should be considered by the conceptual model.

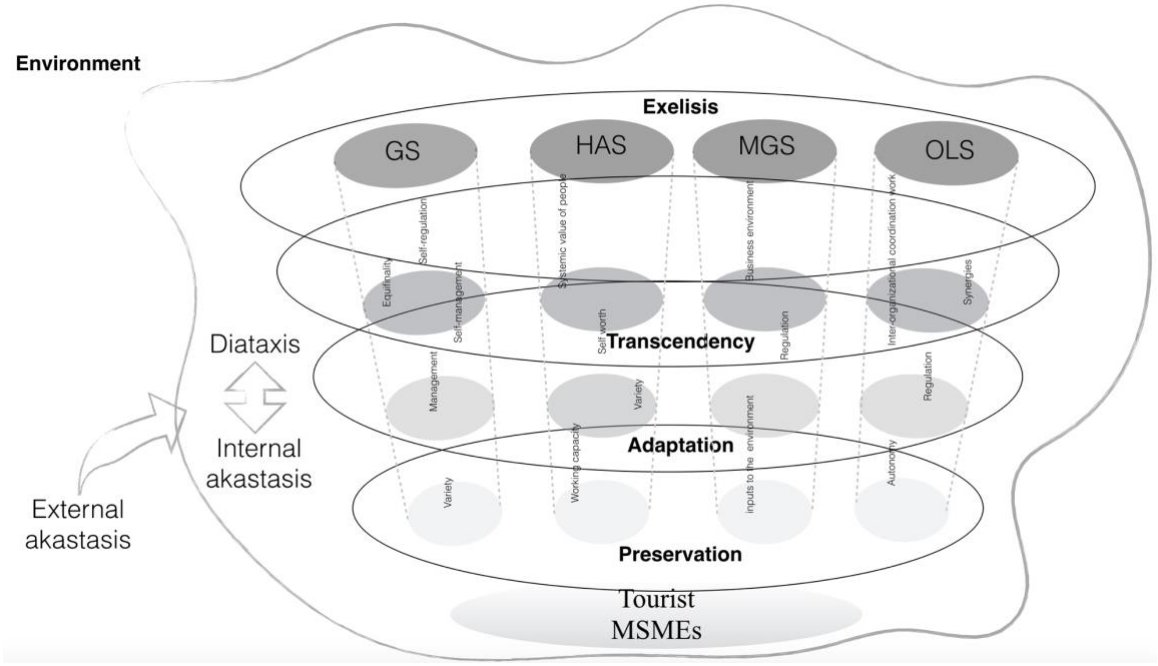

Figure 1. Conceptual model of systemic complementarity

Figure 1, shows the conceptual model as well as the desired transformation. Also involves a set of activities whose logical requirements are synthesized in four relevant systems and, their interaction leads to the complementarity opening possibilities to differentiate the current situation of the actors. The collective work seeks to select critical information, avoiding the accumulation of irrelevant information, to enable its harmony with the dynamics in the environment. These relevant systems are:

Management System (MGS): regulates those areas that attribute complementarity among tourist MSMEs. Also enables more effective responses of what they could achieve individually, in addition to increase variety to give stability within the limits of the system. Balances present and future through a process of decision making as a conglomerate that allows these organisations to transcend, without affecting the autonomy of MSMEs. It classifies the basis aspects for business cooperation, generates policies and commitments to work and make decisions as a whole.

Human Activity System (HAS): the articulation of heterogeneous work teams enriches the system properties. Integrates the necessary skills, which will be transformed into emerging properties, through mechanisms of communication and interaction that establish working together toward a common goal. It guarantees the level of interaction among the components that contribute to the organisation of each subsystem.

Morphogenesis system (MS): sets the routes of interactions among subsystems, of the subsystems with its particular environment and, the interactions of the systems contained in the whole system, allowing the introduction or exclusion of information to it. It involves the reorganisation of the nodes and interactions for the achievement of the purpose. The

connections maintain the organisational closure, same that distinguishes the system from its environment.

Organisational linkage system (OLS): centred on the collective behaviuor of actors to generate effectiveness of functional emergencies and development, producing every time more awareness of the purpose in the whole system. Simultaneously, the mechanisms of differentiation are achieved through measurement of the interactions performance.

The development of AHP consists of three basic functions: structuring of complexities, assessment and synthesis (Sadegh, 2015):

1. Structuring of complexities. The vertical and horizontal deployment shown in Figure 2, guarantees the property of redundancy and the limits of the components. The level 0 express the general objective, while the following criteria and attributes (table 1) that derive from the root of the hierarchical structure and detected with the same relationship.

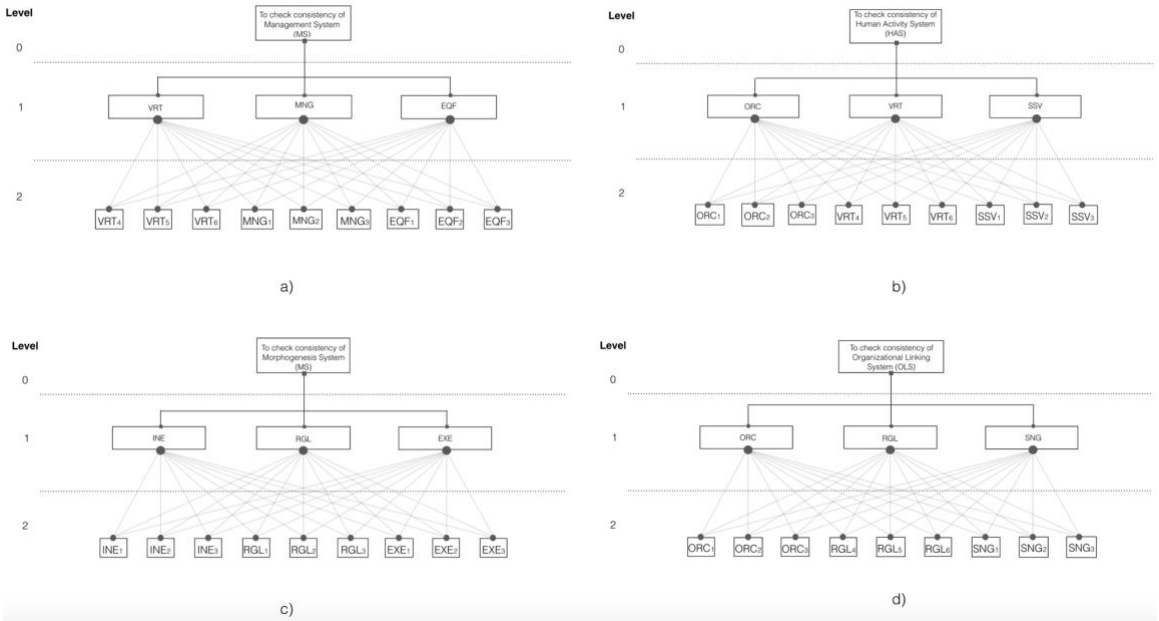

Figure 2. Structuring of complexities; a) Aggregation of management system; b) Aggregation of human activity system; c) Aggregation of morphogenesis system; d) Aggregation of organizational linking system.

The intervention of experts was conducted in two meetings. The first meeting allowed to evaluate components via a pilot test, its purpose was to reduce the bias in the designed instrument. The second meeting, assured the structure of the questionnaire to obtain information delimited by the relevant variables, that is to say, 12 attributes for each system that means an instrument with 144 paired comparisons.

Table 1. Criteria and attributes

Objective	Code	Criteria	Code	Atributes	Code
Management System	**MS**	Variety	**VRT**	Working capacity	**VRT1**
				Sources	**VRT2**
				Adaptation and learning	**VRT3**
		Management	**MNG**	Self-organization and self-regulation	**MNG1**
				Conflict management	**MNG2**
				Evaluation of strategies	**MNG3**
		Equifinality	**EQF**	Strategies	**EQF1**
				Teology	**EQF2**
				Decision making	**EQF3**
Human Activity System	**HAS**	Working capacity	**ORC**	Perform	**ORC1**
				Management	**ORC2**
				Learning	**ORC3**
		Variety	**VTR**	Heterogenity	**VTR1**
				Coordination	**VTR2**
				Basic functions	**VTR2**
		Systemic value of people	**SSV**	Guanxi	**SSV1**
				Loyalty	**SSV2**
				Adaptation and learning	**SSV3**
Morphogenesis System	**MGS**	Business environment	**INE**	Organizational environment	**INE1**
				Structural variety	**INE2**
				Autonomy	**INE3**
		Regulation	**RGL**	Feedback	**RGL1**
				Control	**RGL2**
				Maintenance of viability	**RGL3**
		Environment	**EXE**	Conplexification	**EXE1**
				Entropy	**EXE2**
				Adaptation and learning	**EXE3**
Organizatinal Linking System	**OLS**	Inter-organiational coordination work	**ORC**	Niveles de integración	**ORC1**
				Comunicación	**ORC2**
				Articulación	**ORC3**
		Regulation	**RGL**	Complejificación	**RGL1**
				Control	**RGL2**
				Diataxis	**RGL3**
		Synergies	**SNG**	Capacidades relacionales	**SNG 1**
				Capacidades integrativas	**SNG2**
				Organización	**SNG3**

2. Assessment. The preferences of the actors are incorporated into reciprocal square matrices that reflect the domination of one item against another with respect to an attribute or property in common. Saaty & Vargas (2012) propose the use a value that range between 1/9 and 9 because it avoids the problem that arises when relative comparisons are made.

Its development, formed 10 square matrices for each system, whose integration took as its reference point the three axioms proposed by Saaty. The consistency of the matrix was calculated from the eigenvectors (Eigenvector λ). Basic data to determine the consistency of the relevant systems. In relation to the above, he Shannon's entropy is implemented to reduce the uncertainty among the answers from the experts, in that sense the geometric consistency index (GCI) and the consistency ratio (CR) are calculated to ensure accuracy in the condensed matrices.

3. Synthesis. The level of inconsistency tolerance through the amount of redundancy in the approach, is the calculation of the CR, in which acceptable value must be lower than 10 %. The results in the four condensed matrices, prove the interrelations between criteria and attributes, and its λ shows a symmetric behaviour, this allows to stablish a high level of interdependence, that is to say, attributes inherited the significance of the criteria and the influence of the attributes is transmitted toward the objective, figure 3.

Number of criteria:	9	Valor propio (λ):	9.18
Number of participants:	10	GCI:	0.06
Consensus:	97.20%	CR:	1.60%

Matrix

Criteria	Attribute	VRT1	VRT2	VRT3	MNG1	MNG2	MNG3	EQF1	EQF2	EQF3	Weights
VRT	VRT1	-	1	7/8	1	2/3	1 1/4	1 2/3	1	1 1/5	11.60%
	VRT2	1	-	8/9	1	1	3/4	1 1/4	1 1/4	7/8	10.53%
	VRT3	1 1/7	1 1/9	-	2/3	1 1/7	1 1/3	1 1/3	1	7/8	11.51%
MNG	MNG1	1 1/9	1	1 1/2	-	1 1/2	1 1/9	1 1/9	1 2/5	1	12.82%
	MNG2	1 1/2	1	7/8	2/3	-	5/8	1	1	5/7	10.07%
	MNG3	4/5	1 1/7	3/4	8/9	1 5/8	-	1 1/7	1	1	11.05%
EQF	EQF1	3/5	1 3/8	3/4	1	1	7/8	-	7/9	1 1/9	10.14%
	EQF2	1	4/5	1	5/7	1	1	1 2/7	-	5/9	9.90%
	EQF3	5/6	1 1/7	1 1/7	1	1 2/5	1	8/9	1 4/5	-	12.37%

(a)

Number of criteria:	9	Valor propio (λ):	9.84
Number of participants:	10	GCI:	0.26
Consensus:	96.20%	CR:	7.3%

Matrix

Criteria	Attribute	ORC1	ORC2	ORC3	VRT4	VRT5	VRT6	SSV1	SSV2	SSV3	Weights
ORC	ORC1	-	1	1	1	1	1	1	1	2	11.60%
	ORC2	1	-	2	3	1	1	1	1/2	1	10.53%
	ORC3	1	1/2	-	1	1	2	1	1	1/4	11.51%
VTR	VRT4	1	1/3	1	-	1/2	2	1	1	1	12.82%
	VRT5	1 1/2	1	1	2	-	2	3	1	1	10.07%
	VRT6	1	1	1/2	1/2	1/2	-	1	1/2	1/2	11.05%
SSV	SSV1	1	1	1	1	1/3	1	-	1/3	1	10.14%
	SSV2	1	2	1	1	1	2	1 2/7	-	4	9.90%
	SSV3	1/2	1	4	1	1	2	1	1/4	-	12.37%

(b)

Number of criteria:	9	Valor propio (λ):	9.07
Number of participants:	10	GCI:	0.02
Consensus:	97.40%	CR:	0.6%

Matrix

Criteria	Attribute	INE1	INE2	INE3	RGL1	RGL2	RGL3	EXE1	EXE2	EXE3	Weights
INE	INE1	-	1	1 1/6	7/8	1	4/5	1 1/4	1	1 1/5	11.40%
	INE2	1	-	1 2/9	7/8	1	8/9	1	1	1 1/3	11.43%
	INE3	6/7	4/5	-	1 1/5	1 1/7	1 1/7	7/8	1	5/8	10.91%
RGL	RGL1	1 1/7	1 1/7	5/6	-	1 2/7	1 1/7	1 2/5	1	1	12.22%
	RGL2	1	1	7/8	7/9	-	1	4/5	1	1	10.46%
	RGL3	1 1/4	1 1/9	7/8	7/8	1	-	1 1/7	7/8	1 1/5	11.30%
EXE	EXE1	4/5	1	1 1/7	5/7	1 1/4	7/8	-	1	1 1/5	10.93%
	EXE2	1	1	1	1	1	1 1/7	1	-	1 1/4	11.40%
	EXE3	5/6	3/4	1 1/5	1	1	5/6	5/6	4/5	-	9.95%

(c)

Number of criteria:	9	Valor propio (λ):	9.2
Number of participants:	10	GCI:	0.06
Consensus:	98.20%	CR:	1.70%

Matrix

Criteria	Attribute	ORC1	ORC2	ORC3	RGL1	RGL2	RGL3	SNG1	SNG2	SNG3	Weights
ORC	ORC1	-	1 1/6	3/4	7/8	1	1	1 1/6	2/3	8/9	10.30%
	ORC2	6/7	-	1 1/4	1	7/8	3/4	1	7/8	1	10.40%
	ORC3	1 1/3	4/5	-	1 1/9	1 4/9	1	1 2/5	1	5/8	11.52%
RGL	RGL4	1 1/7	1	8/9	-	1 1/4	1 3/5	2	1	1	12.74%
	RGL5	1	1 1/7	2/3	4/5	-	1/2	1 3/4	4/5	1 1/7	10.28%
	RGL6	1	1 1/3	1	5/8	1 6/7	-	1	4/7	1	10.88%
SNG	SNG1	6/7	1	5/7	1/2	5/8	1	-	1	2/3	8.84%
	SNG2	1 1/2	1 1/7	1	1	1 1/4	1 3/4	1	-	1	12.91%
	SNG3	1 1/9	1	1 5/8	1	7/8	1	1 1/2	1	-	12.13%

(d)

Figure 3. AHP matrices; a) management system; b) human activity system; c) morphogenesis system; d) organizational linking system.

DISCUSSION

In accordance with the opinions of the experts, it was obtained a consensus of 97.2% for the MS, this result favors the strength of the system, and is reinforced by the values obtained for CR and GCI that are proportional and are within tolerance ranges.

Concerning the criteria which compose it, found that the MNG is a critical factor in balancing the present and future of the organisation, therefore, it is essential to provide the

organisation of communication channels and mechanisms of immediate feedback, to facilitate the flow of information and give significance to variety regarding the purpose which has the system, involving a constant interaction between the VTR and EQF criteria. Experts agree, to make decisions and regulate operations is necessary to induce self-regulation, as a mechanism for compensation.

The results for the SO, they establish acceptable inconsistency values in CR and ICG integrated consensus and a consensus of 96.2%, where the proposed is consistent.

The criterion VTR is the variety that add the collaborators in the organisation, mainly derived by processes not standardized and low investment in training, increasing the range of knowledge and skills. It is commonly identified as a negative factor, however contributes to the authenticity and autonomy of the conglomerate to be well addressed, constituting multifunctional systems. Meaning little correspondence to international standards for the approval on operation of tourism, but enables a quick cooperation and react efficiently to nonstandard complex problems. According to experts, an informed operational variety allows correspond to the environment, in addition to helping to enrich various guidelines of the actors integrated in the model. With respect to the VSP, the second dimension of the system, refers to the idiosyncrasies of the people, as a transformation mechanism in the management and operation; as it makes a good organisational culture that integrates distinctive features of a locality. The ratings show that experts consider as an aspect that is difficult to treat, although they accept that coexistence and social ties, are immersed in their daily operations.

The criterion ORC, sets learning as it puts to the test the quantity and quality of operational capabilities, also determine the capabilities to integrate, build and reconfigure the endowment of resources and skills for new processes.

The results of the consolidated matrix MGS, describe the regulation of the mechanisms of interaction and communication as synergies and mutual symbiosis among the systems of the model, they are relevant in the canalization of information coming from the environment to preserve the viable equilibrium of its internal and external environment. Therefore, the production of changes to the ruptures of symmetries, looking for profound transformations, instead of small adjustments organisational.

The weights in the dimensions of the MGS, suggest that there is minimal variation among the three, however, RGV allows synergies between INE and EXE, i.e. Regulation of structural complexity. Experts believe that the progressive construction of an organisational structure requires interrelations between its parts and their specific environments, condition that up to the time of individually have not been able to achieve.

Finally, the trials for the SVO, incorporate a level of acceptable inconsistency in ICG and RC, with a degree of greater than 90% consensus. This highlights a symmetrical behaviour. Experts agree that linking not only is set to generate feedback mechanism, but to reduce the entropy among stakeholders, identify and improve decision-making (Stary, 2017). In addition, they identify as crucial points culture and values, which is learned through social

interaction and is not transmitted by communication process, so that the definition of notions and concepts of an organisational culture, tying policy and participation ensure interactions among actors. On the other hand, favours to establish common procedures and standards in central and not central aspects to the operational units, in order to avoid inconsistent response to the environment. In addition to facilitate their interaction, assuming that all work for an organisational purpose without focusing on the most outstanding companies in the group of the operational unit, or on the primary activity outstanding. As it is recognized that this may affect the performance and disintegrate the whole organisation.

CONCLUSIONS

1. The systemic approach granted to articulate reflective frames that correspond to problems with a different nature and glimpsed adaptable and coherent solutions to the real world, in addition to giving the order and learning to the system. This complementarity combined a framework that allowed to understand and treat the perceptions of the actors involved in a problem situation, in qualitative and quantitative terms.

2. The conjunction of the SSM and AHP was essential to check the components of the model, which reflect the reality of MSMEs stakeholders, what was validated through mathematical treatment provided by AHP. It selection through the TSI, allowed to meet expectations regarding methodological complementarity.

3. The abstraction of the conceptual model, recognized the role of the human component in the processes of the tourist MSMEs and identified it as the way to maximize the capabilities of the organisations. Unlike associative proposals, seeking the approval of properties, the presented model enriches and strengthens itself from the heterogeneity of companies to generate capabilities that seek their permanence in a turbulent environment, aspect that the associative proposals do not consider, since they use linking as route to increase the production.

4. The results obtained in the comparison, stipulate that systemic complementarity among tourist MSMEs can enhance collaborative work and enable a profitable adaptation for the businesses. This aspect is something that the models based on associativity does not suggest. The use of heterogeneity through business interaction, enables the ability to produce effective responses; this would be unlikely with an isolated action and often mimics business models lacking systemic character.

5. Finally, it is highlighted the value that theoretical and practical experts give to idiosyncrasies and culture to establish organisational behaviour, since these attributes strengthened organisational ethics, formalizing loyal connections necessary for complementary work. These new interactions in the system allow confront openly the changes of the environment, and maintain an autonomous identity as the destination.

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