

HUMAN CAPITAL MANAGEMENT INNOVATION FOR MEXICAN LODGING THROUGH AUTOPOIESIS AND SELF-ORGANISATION

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ABSTRACT

In the context of the Mexican hospitality sector, Small and Medium Enterprises (SMEs) are considered important agents given their participation in the generation of jobs and new business relations, nevertheless their closure rate in the first two years of operation is high. In addition, these companies face structural problems that limit their capabilities to attenuate the variety of the environment and, simultaneously, improve their operations. This paper, presents a proposal through the complementarity between the Soft Systems Methodology and the Viable System Model to build a structure that allows the human capital management to influence a state of self-organisation based on precepts of the Autopoiesis Theory. As a result, a model that integrates self-regulation, autonomy and learning to support self-management of human capital was obtained to adapt continuously to its current context.

Keywords: Autopoiesis, Self-organisation, SMEs, Human Capital Management, SSM, VSM.

INTRODUCTION

The international environment it has been characterized by social disturbances, political instability, and economic uncertainty. However, the tourist activity has shown resilience to changes in this scenario and it has been able to grow in a sustained way in the last six years (CNET, 2016).

The previous allows highlighting some aspects of tourism, such as structural strength, dynamism, and ability to interconnect with other productive activities. In this regard, the World Tourism Organization reported that 2016 was preponderant for tourism as the international arrivals of tourists reached 1.2 billion, which represents 4% more than 2015 (OMT, 2017). Besides, tourism, contributes to economic growth since one out of ten jobs corresponds to this sector and has an impact on the increase of exports and imports of each country. This puts the tourist work in a situation of an advantage because it activates and impels the economy of the country, region or municipality in which it develops.

In the Mexican context, tourist activity impacts positively, in economic terms, since contributed 9 billion dollars to the Gross Domestic Product of the country. Regarding

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employment generated 4, 059, 500 direct jobs in 2016, this includes the work created by hotel companies, travel agencies, airlines and other transportation services (CNET, 2017; Scowsill, 2017). This setting fosters opportunities for participation for small and medium-sized enterprises (SMEs) that are also relevant to the dynamics of a tourist destination as they add a series of products and services, in addition to lodging, such as recreational activities and transportation translate into benefits for the economy of the localities.

In the expressed framework, it is intended to locate the SMEs dedicated to the lodging service affected by accelerated changes of the environment and that, in turn, increase the entropy degree and affect its capability of self-organisation and adaptation. In this regard, is considered that human capital management (HCM) is exceeded by the variety present in the environment and within the company, what impacts negatively on the efficient fulfillment of tasks and objectives without neglecting the evolution of the whole system in its current context.

As human activity system (HAS), lodging SMEs, they carry out their primary activities in a complex environment, that overcome its capabilities and structure. Thus, it is considered that these should be designed or reconfigured so that they can attenuate the impacts to remain, through conscious learning processes. On that basis, these HAS must move from a reactive management model to one that seeks autonomy for the operative units so that they can make the necessary adjustments having as purpose balancing through self-organisation (Gershenson, 2015).

Derived from the previous, this work aims to present a conceptual model that provides an idea to the actors with the capacity to decide on how to reorganize the tasks and functional relationships through the HCM to facilitate the process of self-organisation in all areas of the system. To this end, the Soft Systems Methodology (SSM) and the Viable System Model (VSM) were used in a complementary manner.

Lodging SMEs as a living system

Social structures are human designs, a product of interactions and processes of evolution, being able to disintegrate in the short term or endure for an extended period. In these, their members can separate voluntarily, not perform its functions or intentionally destroy the structure (Kesiena & Olivier, 2014). On this basis, the fact that each member comes from a different context generates a certain degree of disorder, since personal purposes can be counterposed propitiating a behaviour in which each element takes a decision away from the purpose of the whole system.

Another characteristic, of social structures, is its considerable independence concerning any physical structure being able to eliminate or replace it. For example, biological systems have identifiable physical and physiological limits with relative ease, even after their operation has ceased (Espejo & Reyes, 2012). However, in a social structure, communication and mutual influence among its components is such that it can also be understood as a concatenation of events, rather than a conjunction of physical parts (Bausch (2002), Without detracting from the import processes of either information or energy to sustain the structure, as well as those of inputs to translate them into productive processes (Katz & Kahn, 2008).

From a basic posture of the theory of living systems, these coexist in an environment that provides conditions to generate a lasting structure that includes life and propitiates some

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characteristics such as energy processing and information through its subsystems, including a determinant or executive element that enables survival at all levels (Miller, 1985; Swanson, 2006). Therefore, the systems must possess structural components in each subsystem or depend on other living systems to exist, so that the critical subsystems to exist are: The processors of matter-energy-information, processors of matter-energy and those that process information.

Derived from the previous idea, conceptualize to lodging SMEs as living system, requires to include in its management the entropic process as a natural dynamic that leads to disorganisation or extinction (Katz & Kahn, 2008; Mobus & Kalton, 2015), as this raises the need to reduce this entropic process incorporating measures of order as may be information or decisions, in order to facilitate equilibrium. From this perspective the primary objective of a HAS, such as the lodging SMEs, it is translated firstly in the survival in each of its stages of development.

It is necessary to add that the higher the pace of change, the higher the variations in the problems and the solutions that are posed for these will lose validity so that, before the constants disruptions in the environment, the increasing competition of other companies or variations in user preferences, actors with management functions are expected to face change and diversity. In this sense, it is necessary to develop capacities for self-organisation and resilience so that the system orients its behaviour towards preservation.

Taking up again previous ideas, and that lodging SMEs must continue operating, it is considered appropriate to apply properties of the Autopoiesis theory (Maturana & Varela, 2003; William, 2010) to these organisations through the management of its human capital. Thus, this theory is not limited to the comprehension of relations in the cellular plane, but it can be applied to the couplings that originate in more complex systems as long as they seek autonomy, emergence, operative closure, self-structuring, and reproduction. The pertinence of applying those properties, to these HAS, this is because this theory exceeds the positive feedback concept of the first order cybernetics (Schwaninger, 2015) and it allows passing the basic relation producer-product toward one in which the system is constantly as a result of its operation.

Thus, to foster an autopoietic state in lodging SMEs, using the HCG, means that this kind of HAS must be able to differentiate itself from its environment through a specific configuration. So that its identity emerges from the internal operations and cognitive processes of their members, therefore the adaptive phase would not be the product of random selections but of conditions established by its interactions. Therefore, autopoiesis can be applied at all levels of the company and the interventions designed from that perspective should be aimed to understand structural aspects and the internal behaviour of the system to restate its interrelations.

In concordance with Sarmiento (2009), the autopoietic phenomenon related to the lodging SME and the management of its human component, can comprise the following phases: 1) Autonomy, in which an organisation is no more a set of departments but an entity resulting from the relations and integration of these, requires distance of its environment and autonomy means that only through the perspective of the whole is possible to determine what is relevant to the indifferent, 2) emergence, it indicates the irruption of a new order, whose characteristics can be induced by principles or models Systems Science, 3) operational

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closure, this should not be understood as opposed to openness, but as a condition that allows the elements to be organised in self-guided structures, 4) self-construction of structures, possessing the closure of its operations, the system should not import structures, but build them by itself.

At this point, it is emphasized that the HCM cannot be explained only by a causal scheme of inputs and outputs. Therefore, applying the theory of autopoiesis to the HCM of the lodging SMEs is considered pertinent since they are open social structures with defined purposes that operate seeking to maintain their identity invariably within a series of restrictions given by the environment and the changes produced by internal relations (Restrepo *et al.*, 2016). Therefore, the proposal of the conceptual model to enrich the HCM seeks to respect the property of organisational closure or invariability and lead the HAS to the generation of the necessary modifications, in structure and space to reach a state beyond viability, that is to say, to foster an iterative state that will be enriched continuously and produces its organisation through which it will be possible to compensate the continuous disturbances of the environment.

Systems thinking for designing a self-organisative lodging SME considering the human element

In various sectors, HCM is a relevant function, but in service companies, the human component should be sought as the work in the tourism industry, especially in the hotel sector, presents unfavourable conditions for the middle and operational staff. This constitutes a barrier that hinders the integration of staff with high technical and educational level (Marija Rok, 2012), such condition affects mostly SMEs because of the gap between job requirements and benefits offered to the staff, which causes that those who enter the company, do so without the expectation of staying or developing in the long-term affecting in the high rotation of the organisation.

There are different forms in which lodging SMEs can adopt to manage their human capital and some examples are raised in contributions such as Agyepong, Fugar, & Tuuli (2010); Anthony, Perrew, & Kacmar (1993); Bondarouk & Brewster (2016); Boxall (1996); Boxall & Purcell (2003) Capapé Aguilar *et al.* (2016); Jackson & Schuler (2003); M Rok & Mulej (2014); Valentine *et al.* (2013). However, most of these models require a particular structure and resources to be implemented at all levels and are assessed concerning acceptance, which exceeds the capabilities of the SAH above and move away from the central objective that HCG should pursue in these companies that is to improve the effectiveness through the contribution of the employees.

In the mentioned context, it is understood that the human capital plays a significant role to ensure the quality in the services of the lodging SMEs (Haynes & Freyer, 2000). On this idea, the HCM in the HAS must be integral and coherent concerning the way of employing, promoting and developing people. However, according to Maldonado *et al.* (2017), the management of people is a weak aspect of tourist companies so it must move from the administration of work towards a holistic approach. In that sense, it is considered Madera *et al.* (2017) to establish the need of alienating the human factor operations and the organisational strategy, so that the HCG must impact each person to support the achievement of the objectives and at the same time increase the affiliation degree to the company.

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Lodging SMEs have a structure that is exceeded when trying to reach a state of survival. Also, they focus efforts mostly on obtaining economic benefits, neglecting other relevant areas. On the idea of survival, it is added that managers develop plans and strategies limited to fulfill what was requested, but not to influence in a state of sustainability (Maes & Sels, 2014).

For an organisation to survive, it must interact with its environment, this demands for management to reflect about the complexity of the environment. Therefore, the responsiveness of the lodging SMEs is not only linked to providing quality services at a reasonable cost, but also with the work methods and management systems at its disposal to give the capacity of response to the environment.

Beer (1985) indicates that most managers understand organisational viability from an economic perspective, this generates the idea that most of the problems in the system have that origin. Thus the efficiency of an business is affected both by the theoretical-practical approximations and by the decision policy to deal with the relations in the system (Johnson & Leydesdorff, 2015). In this regard, the human dimension in a system becomes vital in stages such as the operationalization of strategies, fulfillment of its purpose (Paucar *et al.* 2015), as well as in the development of the autopoietic ability.

Taking up the above, the HCM must surpass the vision of being an aggregate of activities to manage the relations between the staff in a company and to use knowledge, abilities and commitment behaviour enabling employees to collaborate, to help the HAS influence the achievement of objectives, through autonomy and self-regulation (Restrepo *et al.*, 2016). So that the SME recognizes both the purpose of the system in which it is nested, as well as its dynamics of relations, to distinguish and to use the cognitive processes to generate decisions with significant scope, to change its structure when it is necessary acquiring properties that allow the transformation and equilibrium.

Therefore, the design of its structure, as well as the management, must be executed from a different perspective. Thus, it must incorporate into its dynamic a system that contemplates the most extensive variety range, to generate recommendations and reliable results that allow facing the problems related to the human factor. On this idea, and following Herrscher (2010) and Gharajedaghi (2011), to generate transformations into SMEs, it is required that all actors (management, middle managers, and operational levels) recognize the need to change and shape an organisational framework that enables applying interventions aimed at this purpose. Thus, it is considered that to respond to changes in the environment and to generate corrections is necessary, first, the commitment of management and second, that the command structure supervises such commitment, as well as involving the workers.

Application of the Soft Systems Methodology and the Viable System Model

Based on the systemic approach, the research process and knowledge construction can be carried out with the purpose of designing interventions that allow the HAS reach a state of improvement compared to its current state (Badillo *et al.*, 2013; Cosenz & Noto, 2016). On this basis, this approach supports this work by allowing to identify and understand the relations in the structure of a system and positively affect some of its dimensions. In this sense, SSM was used to raise the alternative of functional relations, and the VSM to express the desired changes.

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For the application of these methodologies, first, the system to study was placed through the process proposed by Beer (1985) that is to disaggregate the complexity present on the environment, in which the firm operates, establishing a vertical structure with smaller operative units to allow a better achievement of its purposes and facilitate the activities by reducing the variety addressed by each unit (figure 1).

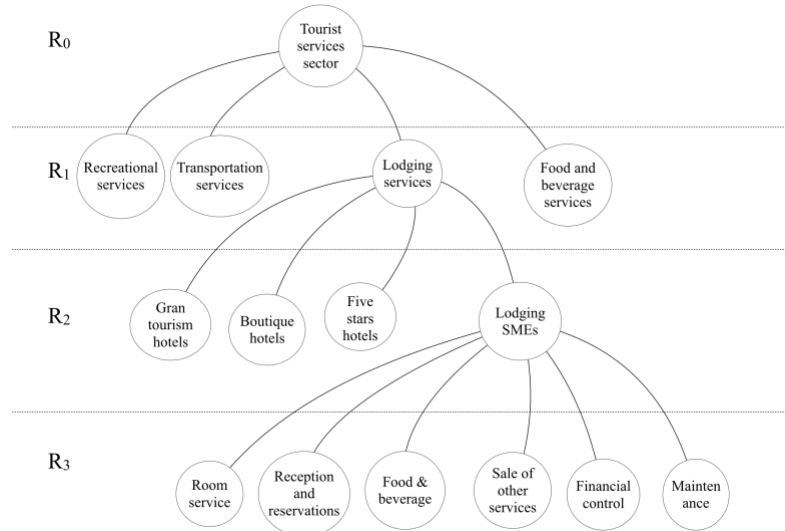


Figure 1. Complexity disaggregation

Source: Based on Beer (1985)

Once identified the system to study, the 1-4 stages of the SSM of Checkland (2001) were developed, to diagnose and identify conflictual relation in the HAS and to name components of the relevant systems and comply the basis of the conceptual model. Therefore, a brief description in each stage is made:

Problem situation: unstructured and problem situation expressed

In the first stage, 20 actors of lodging SMEs with functions related to the HCM collaborated. The purpose was to obtain an overview of the problem situation without implanting a particular structure or vision. This stage allowed to obtain the elements, as well as the levels in which these can be related to procuring an equilibrium state through the HCM.

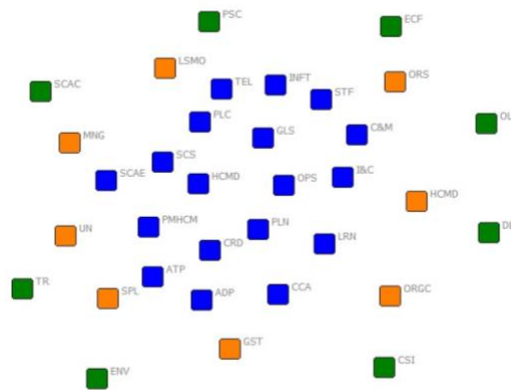


Figure 2. Stage one, problem situation: unstructured

Source: Based on Checkland (2001)

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Figure 2 shows components that relate to the HCM in lodging SMEs, their immediate environment, and their environment. Items located in the center (blue) are those that must interrelate with those located at higher levels to continually evaluate the purpose of the HCG as well as its priorities and, derived from that, to restate processes that enable learning that will lead to the correction of the courses of action, adaptation, and self-organisation of the whole system.

The second and third levels (green and orange elements) are formed by the aspects that impact the course and decisions of HCM, such as owners, managers, the union, and suppliers and whose interaction affects operations, as well as the flow of information in the HAS. At these levels, there are also components with which the HCM must generate synergy, in order to maintain the existence of the whole system. The components of the periphery represent the context that nests the system in focus, in this are different agents that present a series of restrictions to the company.

In the second stage of the SSM, the problem situation expressed, SNA was used to provide information about HAS and the interaction between organisational elements and processes. chart 1 presents the components identified in stage 1 and whose relations were used to identify pathologies regarding the problematics that actors visualize, and this was considered for naming the relevant systems.

Chart 1. Elements of the system

Node	Name	Node	Name
AHCMD	Actions from Human Resource Department	I&C	Information and communication
SCS	Service and client satisfaction	LRN	Learning
PLC	Policies	CCA	Correction of courses of action
GLS	Goals	ADP	Adaptation
OPS	Operations	ATP	Autopoiesis
PLN	Planning	SPL	Suppliers
CRD	Coordination	UN	Union
PMHCM	Processes/mechanisms to manage human capital	MNG	Managers
SCAE	Socio-cultural aspects of employees	LSMO	Lodging SMEs owner(s)
TEL	Technical elements	ORS	Organisational structure
INFT	Infrastructure	HCMD	Human Capital Management by department
STF	Operational staff	GST	Guests
C&M	Control and monitoring	ORGC	Organisational culture
SCAC	Socio-cultural aspects of clients	CSI	Cameras and support institutions
PSC	Political and social conflicts	DLS	Demand on lodging service
TR	Tourism regulation	OLS	Other lodging SMEs

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ENV	Socio-Ecological environment in which tourist SMEs operate.	ECF	Economic factors
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Source: Based on Checkland (2001)

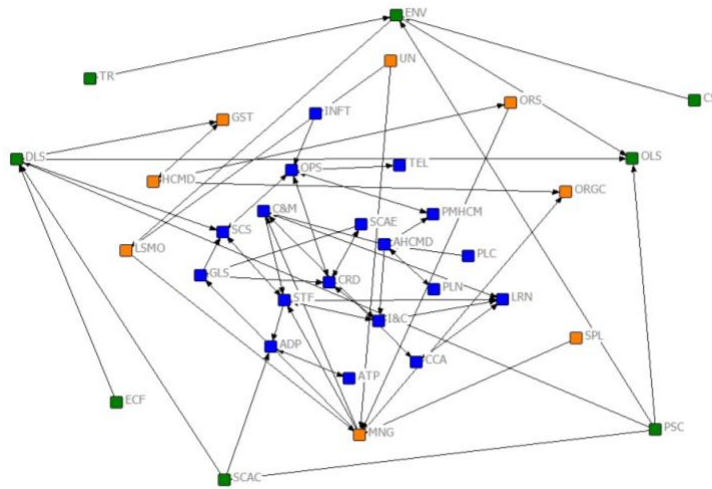


Figure 3. Rich picture of the system and its environment

Source: Based on Checkland (2001)

After expressing the rich vision in which relations among components of the HAS are appreciated (figure 3) and the elements of the environment, some conflicting relations are described as follows:

- a) AHCMD-PLN: The planning processes of HCM in the lodging SMEs are limited; they possess few mechanisms to make plans and communicate them to the staff. Also the programs and strategies used by people in charge of human capital, do not include the staff management and improvement.
- b) AHCMD-C&M: The alignment among the HCM, the operational and strategic framework of the lodging SME, is not clearly identified by actors with decision-making capabilities. In this regard, a significant problem noted was that the lack of clarity on the purposes, objectives, and strategies transmit confusing information hindering the process of self-organisation.
- c) CCA & LRN: Training and instruction are not continuous so that the readjustment process before problem situations or contingencies tends to be slow. In this regard, the intervention of the lodging SMEs owners is not significant given the limited use of tools and indicators, by staff managers, that provide information and determines the impact of actions to support the decision-making process.
- d) STF-LRN: Operative units have limited action to face variations in the environment as the training process does not pursue a specific objective. That is to say; this process is understood as a requirement of the regulatory framework of SMEs so that it is often not aligned with the actual training needs of employees or working groups.

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- e) ADP-ATP: Although the physical and organisational structure of the SAH is defined, the lodging SME has limited capabilities to deal with its staff, since the HCM is exceeded about the correct assignment of persons to appropriate activities seeking to take advantage of both, the individual capabilities and the ones as a group. Therefore, it is not distinguished that HCM contributes to the adaptation and self-organisation of the whole system.

Stage 3. Root definition of relevant systems

To enable the transformation process it was structured as follows: "**A system of support to the management of human capital to assist lodging SMEs in the resolution of problem situations, through the incorporation of systemic elements that foster self-organisation**". This root definition precedes the naming of the relevant systems and raises the transformation process that figure 4 shows:

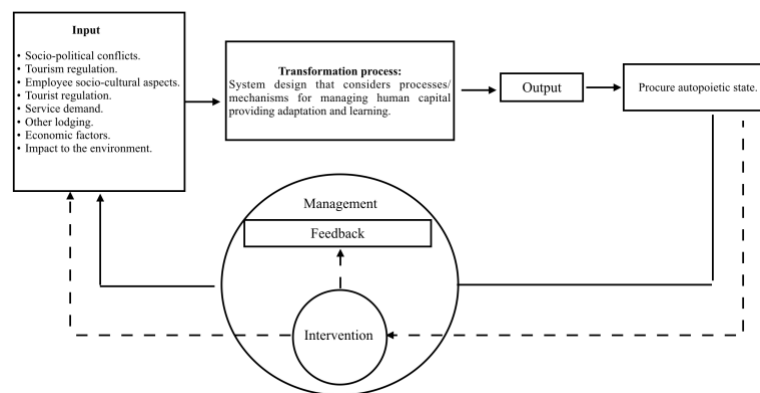


Figure 4. Transformation process

Source: Based on Checkland (2001)

Stage 4. Conceptual model of the relevant system

Considering stage 3 the CATOWE mnemonic was developed, and the following relevant systems were obtained: a) Operative Activity System (OAS), b) Technical system (TECS), c) Control and Monitoring System (COMS) and d) Management and Planning System (MAPS). These systems were developed in a matrix with the aim of enunciating their purpose and generating a series of dimensions and indicators that would be translated into a questionnaire that would allow contrasting the construct proposed with the context in which actors with decision-making capacity over the lodging SMEs human capital management operate. This questionnaire included four sections, each one corresponding to a relevant system. Concerning the reliability, of the items, this was given by the adaptation of validated indicators of the Organization Measurement Handbook (Price, 1997).

Comparison between 4 and 2

This stage does not refer to a strict comparison between two elements but a study on a totality that allows the researcher to generate appropriate changes. Concerning the conceptual models, these are established considering a series of activities to establish a desired situation. Within possible methods to execute this stage the model overlay was used (Hanafizadeh & Mehrabioun, 2017), therefore the analytical hierarchy process was used (AHP) since it allows to study unstructured problems, such as socials and emulates the process in which the

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human brain can translate a multidimensional problem (multicriteria) into one-dimensional (criteria or priorities) (Jiang, 2014; Sadegh, 2016).

Therefore, to contrast the conceptual model with the reality, the following was done:

- Translate the conceptual model into a hierarchical structure, including the dimensions of each relevant system.
- To compare the judgments of the relevant actors through reciprocal square matrices.
- Estimate the consistency of the judgments, using the Saaty scale (AHP 1-9), and if the resulting index was > 1 or 10%, the proposed relationships lacked validity and should be restructured.

To consolidate the judgments of each relevant actor, using the geometric mean of the matrices considering the weight of each expert. Shannon's entropy formula was used to determine the relevance of the model.

RESULTS

For this work, 80 reciprocal square matrices were processed with the purpose of comparing and establishing the validity of the conceptual model. The process of hierarchical analysis allowed to obtain a consistency degree greater than 90% for each relevant system. In figure 5, the results of the MAPS (Management and Planning System) relevant system is shown graphically which includes the following dimensions: autopoiesis, mutualist symbiosis, decision making process.

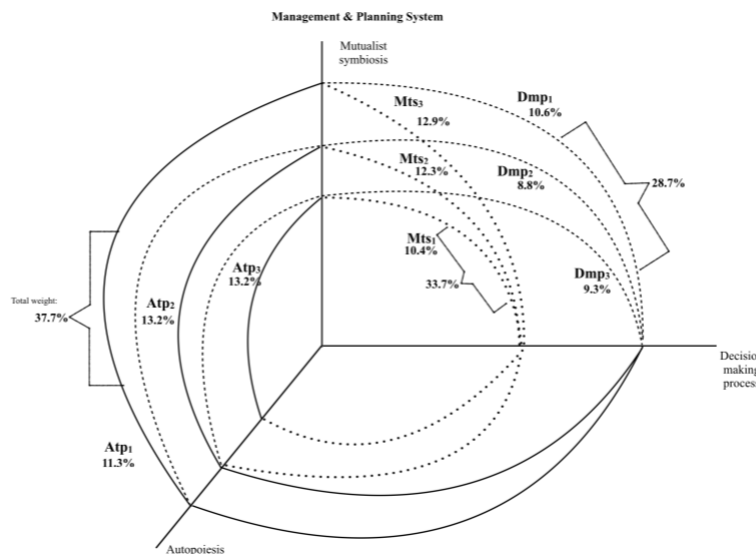


Figure 5. Results for the relevant system 4

Source: Self elaborated, based on AHP comparisons

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The results obtained for this relevant system make possible to infer that the interrelations proposed to support the HCM are mostly determined by interactions between the dimensions of autopoiesis and mutual symbiosis. That is to say, actors with capability to decide over the staff agree that the courses of action towards the people management must include the processes and relevant information that may arise from the interaction with the SMEs owners or with those who have directive functions. Also, results say that little, or almost nothing, information about the environment is included in the way in which operative units carried out their activities. Concerning this idea, it is low the degree of autonomy transferred to working groups in order to interact in benefit to those who are involved without neglecting the general purpose of the HAS. Also, it is important to mention that the use of clear and accurate information will not only positively impact on the improvement of decision-making processes but on the self-organisation and self-regeneration of the operational structures to seek and maintain equilibrium.

Regarding the expressed, and although the notion of autopoiesis was proposed to connote the molecular process in living systems, in the HCM is used to support the understanding of how the basic communication capacities arise, and capabilities arise and how information can support the development of the mentioned HAS. Besides, to shape an autopoietic company the concept can be used not in the physical plane but to notional or conceptual systems, which opens the possibility to a conceptual system aimed toward the autopoiesis to restate, under the criterion of the self-organisation, relations in the HCM.

Considering the previous idea and which conceptual models derived, to a large extent, from a root definition that integrates the shared vision of the problematic situation. Therefore the definition of desirable and feasible changes are established (stage 6) with support of the Viable Systems Model of Beer (1985). Regarding HAS, it is also recommended to select some of the systemic tenets proposed by Wilber (2011) to be included, through VSM, in HCG. It should not be forgotten that it is intended to foster self-organisation in Mexican lodging SMEs. Therefore, the respective changes to the configuration of the system are subordinated to the need to achieve the elemental purpose of a living system, that is, maintaining its existence. This must be translated into the preservation of unity and identity by aligning units and mechanisms to facilitate sufficient autonomy for the HAS to procure self-production of its own elements.

Based on the expressed, the following configuration of the VSM is suggested (figure 6-7) and take it as the design basis for the design of the process of self-regulation in the companies mentioned above. The previous, reconsidering the interactions of the functions and processes of the five systems of VSM. For the VSM the following was done:

- To identify the system in focus and to establish its purpose using stages 1-3 of the SSM.
- Design the S1 and its units respecting the recursion principle.
- Identify S2 components, that is to say, mechanisms that ensure cohesive action between units of S1 avoiding to interfere between each other.
- Design S3, to control S1 elements trying to implement the organisational policy. This system includes the HCM and the regulation of the unit that evaluates the impacts of the environment.

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- To establish S3* components to service S3 and S2 by processing the information they are unable to handle and thus ensure equilibrium.
- To form the S4 to give lodging SMEs necessary and sufficient information to generate courses of action before the present and the future.
- To integrate S5, so it designs organisational policy considering the information of S4 and transmit it to S3.

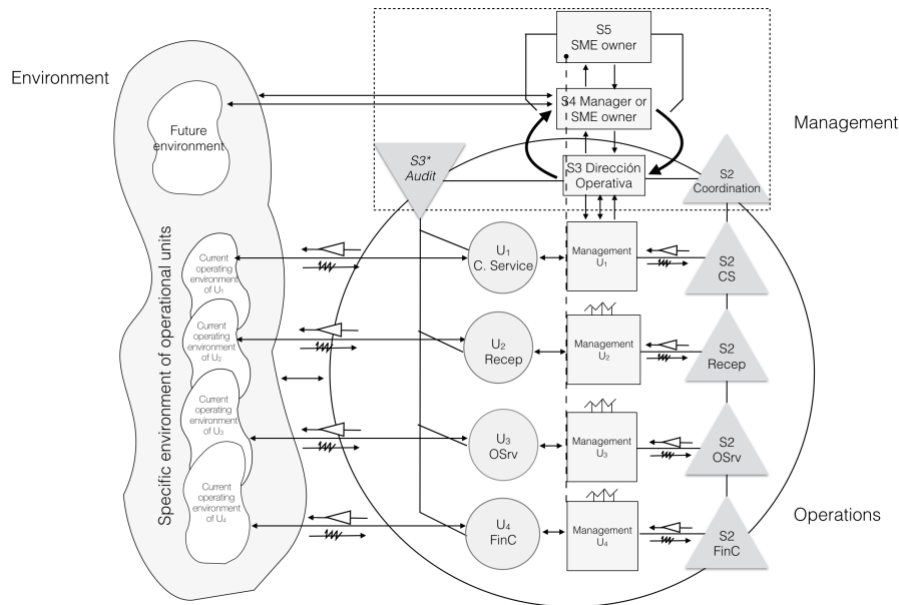


Figure 6. Viable System Model to contrast conceptual model
Source: Based on Beer (1985)

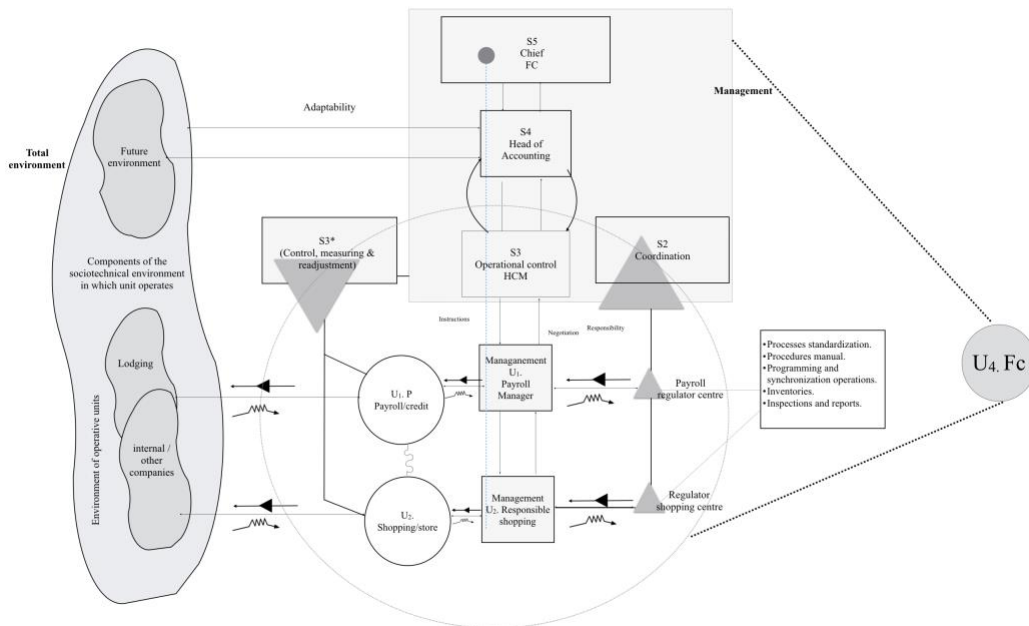


Figure 7. Viable System Model of U4

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Source: Based on Beer (1985)

At this point, it is possible to say that, under the perspective of the VSM, the autopoiesis in systems of human activity requires a design that allows sufficient autonomy and that the system takes care of its own regulation. The preceding refers to maintain the equilibrium state through the development of autonomous systems that possess sufficient amplification to survive and adapt to the environment (Turpin, 2017).

CONCLUSIONS

The constant relation and learning considering the context in which a particular system operates propitiates opportunity areas to address different problems in lodging small and medium-sized. Regarding human capital, it is considered pertinent to review the modalities to manage it because it is through this component that organisational plans and strategies are moved to a practical level, it is also through human capital that resolutions are instrumented, changes and the evolution of systems that have a defined purpose. In this sense, the described in previous sections constitutes an effort from the systemic perspective to understand the of human capital management and the way in which it is possible to affect the execution of this process to improve these human activity systems.

The application of the systemic approach allowed, first to select the tools that made possible to delimit and to shape a problem shared by certain actors with different visions. Second, characterize this situation and carry out a diagnosis to identify pathologies within the human activity system. On this idea, the Soft Systems Methodology allowed designing a construct that contained a series of relevant systems whose ideal state was oriented to contribute to the management of people to move from a modality designed for large companies or other sectors toward one that considers elements of their specific composition.

The flexibility and complementarity that allows the Soft Systems Methodology allowed to integrate the Analytic Hierarchy Process. This tool provided reliability to the comparison process between the vision from the systems thinking with the real world. This indicates that the relations proposed in the conceptual model consider the heterogeneity present in the lodging SMEs, as well as the fact that it is possible to foster the autopoietic process through the human component.

The analytic hierarchy process was used differently because in the context of this work it was used to contrast the construct generated. In this sense, it allowed to measure and test the interrelations between the components of each relevant system, as well as the consistency of the whole model. The results obtained with analytical hierarchy process proved that the proposed relations correspond to the environment in which the small and medium-sized lodging enterprises operate. Therefore, it is possible to foster self-organisation through human capital management.

Finally, for the proposed configuration of the Viable System Model, the result of the verification between stage four and five of the methodology of soft systems was taken as a basis. This exercise allowed to establish that for the lodging SME is possible to leave the dependence towards a single department. On this idea, the state of self-organisation in lodging SMEs requires a design and is through the VSM that can be taken to a practical plane. In this sense, it was sought to provide order and control to the functions or objectives

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established for each relevant system and, also, to generate operative units with the necessary autonomy degree to procure symbiosis and synergy that must prevail throughout the system.

REFERENCES

- Agyepong, S., Fugar, F., & Tuuli, M. (2010). The applicability of the Harvard and Warwick models in the development of human resource management policies of large construction companies in Ghana. In *Proceedings of The West Africa Built Environment Researchers Conference and Workshop* (pp. 525–534). Accra, Ghana: Loughborough University.
- Anthony, W. P., Perrewe, P. L., & Kacmar, K. M. (1993). *Strategic Human Resource Management*. Texas: Dryden Press.
- Badillo, I., Tejeida, R., & Morales, O. (2013). A Didactic tool to teach an introduction to Systems Sciences. *Proceedings of the 57th Annual Meeting of the ISSS*, 1(1), 1–18.
- Bausch, K. (2002). Roots and branches: a brief, picaresque, personal history of systems theory. *Systems Research and Behavioral Science*, 2(19), 417–428.
- Beer, S. (1985). *Diagnosing the system for the organization*. Londres: John Wiley & Sons.
- Bondarouk, T., & Brewster, C. (2016). Conceptualising the future of HRM and technology research. *The International Journal of Human Resource Management*, 27(21), 2652–2671. <https://doi.org/10.1080/09585192.2016.1232296>
- Boxall, P. (1996). The strategic HRM debate and the resource based view of the firm. *Human Resource Management Journal*, 6(3), 59–75.
- Boxall, P., & Purcell, J. (2003). *Strategy and Human Resource Management*. Basingstoke: Palgrave Macmillan.
- Capapé Aguilar, J., Susaeta Erburu, L., Pin Arboledas, J. R., Danvila del Valle, I., & Suárez Ruz, E. (2016). ¿Se mide el retorno de la inversión en las Políticas de Recursos Humanos? Un análisis en España. *Revista Innovar Journal Revista de Ciencias Administrativas Y Sociales*, 26(59), 91–100. <https://doi.org/10.15446/innovar.v26n59.54365>
- Checkland, P. (2001). *Systems thinking, systems practice* (2a ed.). Londres: Wiley.
- CNET. (2016). *Panorama de la actividad turística en México, información para la toma de decisiones de los empresarios*. México.
- CNET. (2017). *Panorama de la actividad turística en México, información para la toma de decisiones de los empresarios*. México.
- Cosenz, F., & Noto, G. (2016). Applying system dynamics modelling to strategic management: a literature review. *Systems Research and Behavioral Science*, 33(6), 703–741.
- Espejo, R., & Reyes, A. (2012). *Organizational systems. Managing complexity with the Viable System Model*. Berlin: Springer-Verlag.

Human Capital Management Innovation Through Autopoiesis

- Gershenson, C. (2015). Requisite variety, autopoiesis, and self-organization. *Kybernetes*, 44(6/7), 866–873.
- Gharajedaghi, J. (2011). *Systems thinking, managing chaos and complexity* (3a ed.). Boston: Elsevier.
- Hanafizadeh, P., & Mehrabioun, M. (2017). Application of SSM in tackling problematical situations from academicians' viewpoints. *Systemic Practice and Action Research*. <https://doi.org/10.1007/s11213-017-9422-y>
- Haynes, P., & Freyer, F. (2000). Human resources, service quality and performance. *International Journal of Contemporary Hospitality Management*, 12(4), 289–299.
- Herrscher, E. (2010). *El valor sistémico de las organizaciones*. Buenos Aires: Gránica.
- Jackson, S. E., & Schuler, R. S. (2003). *Managing Human Resources Through Strategic Partnerships*. Chicago: Thomposon.
- Jiang, W. (2014). *Business Partnerships and Organizational Performance. The Role of Resources and Capabilities*. Nueva York: Springer.
- Johnson, M. W., & Leydesdorff, L. (2015). Beer's Viable System Model and Luhmann's Communication Theory: "Organizations" from the Perspective of Meta-Games. *Systems Research and Behavioral Science*, 32(3), 266–282. <https://doi.org/10.1002/sres.2222>
- Katz, D., & Kahn, R. (2008). *Psicología social de las organizaciones* (2a ed.). México: Trillas.
- Kesiena, M., & Olivier, B. (2014). Applying cybernetic thinking to becoming to a learning organization. *Kybernetes*, 43(9/10), 1–13. <https://doi.org/10.1108/K-07-2014-0155>
- Madera, J. M., Dawson, M., Guchait, P., & Belarmino, A. M. (2017). Strategic human resources management research in hospitality and tourism. *International Journal of Contemporary Hospitality Management*, 29(1), 48–67. <https://doi.org/10.1108/IJCHM-02-2016-0051>
- Maes, J., & Sels, L. (2014). SMEs radical product innovation: The role of internally and externally oriented knowledge capabilities. *Journal of Small Business Management*, 52(1), 141–163.
- Maldonado-Guzmán, G., Garza-Reyes, J. A., Pinzón-Castro, S. Y., & Kumar, V. (2017). Barriers to innovation in service SMEs: evidence from Mexico. *Industrial Management & Data Systems*, 117(8), 1669–1686. <https://doi.org/10.1108/IMDS-08-2016-0339>
- Maturana, H., & Varela, F. (2003). *De Máquinas y Seres Vivos. Autopoiesis la Organización de lo Vivo* (6a ed.). Buenos Aires: Lumen.
- Miller, J. (1985). Applications of living systems theory. *Systems Practice*, 8(1), 19–44. <https://doi.org/10.1002/bs.3830300103>
- Mobus, E., & Kalton, M. (2015). *Principles of Systems Science*. Londres: Springer.
- OMT. (2017). *Panorama OMT del Turismo Internacional*. España.
- Paucar, A., Hart, D., Roma, J., & Sierra, D. (2015). Applying Soft Systems Methodology to the practice of managing family businesses in Catalonia. *Systems Research and Behavioral Science*, 33(3), 312–323.
- Price, J. (1997). Handbook of organizational measurement. *International Journal of Manpower*, 18(4/5/6), 305–558.
- Restrepo, M. J., Lelea, M. A., & Kaufmann, B. (2016). Second-Order Cybernetic Analysis to Re-construct Farmers' Rationale When Regulating Milk Production. *Systemic Practice and Action Research*, 29(5), 449–468. <https://doi.org/10.1007/s11213-016->

Human Capital Management Innovation Through Autopoiesis

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- Rok, M. (2012). Labour Market Skill Deficiencies in the Tourism and Hospitality Industry. *Our Economy, Journal of Contemporary Issues in Economics and Business*, 58(3–4), 80–87. <https://doi.org/10.7549/ourecon.2012.3-4.08>
- Rok, M., & Mulej, M. (2014). CSR-based model for HRM in tourism and hospitality. *Kybernetes*, 43(3/4), 346–362.
- Sadegh, M. (2016). A Hierarchical Aggregation Approach for Indicators Based on Data Envelopment Analysis and Analytic Hierarchy Process. *Systems*, 4(1), 1–17.
- Sarmiento Campos, J. A. (2009). Autopoiesis, bucles, emergencia, variedades topológicas y una conjetura sobre la consciencia humana. *Arbor*, 185(738), 871–878. <https://doi.org/10.3989/arbor.2009.738n1059>
- Schwaninger, M. (2015). Model-based Management: A Cybernetic Concept. *Systems Research and Behavioral Science*, 32(6), 564–578. <https://doi.org/10.1002/sres.2286>
- Scowsill, D. (2017). *Travel & Tourism economic impact 2017 Mexico*. London.
- Swanson, G. (2006). James Grier Miller's Living Systems Theory (LST). *Systems Research and Behavioral Science*, 23(3), 263–271. <https://doi.org/10.1002/sres.724>
- Turpin, M. (2017). Autopoiesis and Structuration Theory: A Framework to Investigate the Contribution of a Development Project to a Rural Community. *Systems Research and Behavioral Science*, 34(6), 671–685. <https://doi.org/10.1002/sres.2403>
- Valentine, S., Hollingworth, D., & Francis, C. (2013). Quality-related hr practices, organizational ethics, and positive work attitudes: Implications for HRD. *Human Resource Development Quarterly*, 24(4), 493–523.
- Wilber, K. (2011). *Sex, ecology, spirituality: the spirit of evolution* (2a ed). Boston: Shambala.
- William, P. (2010). Autopoiesis and Knowledge in Self-Sustaining Organizational Systems. *The International Multi-Conference on Society, Cybernetics and Informatics*. University of Florida.