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SYSTEMS APPROACH FOR CONTEMPORARY COMPLEX TOURISM SYSTEMS

Abstract: *Systems approach represents thinking outside the box and is connected to the transformation of common linear approach and thinking. Western society followed rules of classical western science, which form many centuries took analysis as mainstream of thinking and researching. One can find perfect and logical explanation for this. In the past, classical science researched matter and reached optimal results with analysis and analytical thinking. Nowadays more and more scientists research intangible world around matter and cooperate with prevailed, fastest growing service industry such as tourism. Following paper presents systems approach in tourism, which defines wideness, co-dependency among tourism system elements, and "big picture" point of view. In a frame of systems methodology, we will show the importance of systems approach in order to understand complexity in the area of tourism. At once an excellent example of the analytical approach will be shown in so called "the tip of the iceberg" theory, where events represent analytical thinking and structure or base of the iceberg represents systems approach. Complexity of the tourism systems will be explained and a model of a common tourism system developed. We claim that the analysis, in the past, caused technological progress; it caused the development of western science, which we now know it. It led to the discoveries but for dealing with contemporary complex challenges is not sufficient. Today a systems approach is suitable enough for dealing with complex question in the area of tourism and of course in global society.*

Keywords: *systems approach, tip of the iceberg, modelling, tourism, "the big picture", co-creative society*

1. Introduction

Contemporary tourism deals with analytical consciousness; it is still oriented towards outer world and analysis. Systems approach to tourism is necessary, since tourism is a complex system, which deals with many subsystems and softly defined problems. Here one should take into consideration systems thinking, which is a framework that is based on the belief that the component parts of a system can best be understood in

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the context of relationships with each other and with other systems, rather than in isolation. The only way to fully understand why a problem or element occurs and persists is to understand the part in relation to the whole. (Capra and Lusi, 2014)

How did the humankind reach systems consciousness or thinking and later systems common known approach? In the beginning human beings experienced themselves as one with the nature. To survive they needed to understand and control the world. This kind of thinking soon become predominant and the experience of one with the nature ("oneness, wholeness") were lost. Breaking things down into parts, analytical thinking became the way how people thought. (E.g. Mass production is an example of analytical thinking. As people left farms and went to work to the factory, they learned to do isolated tasks the way engineers wanted them done. Systems thinking reappeared in the 1950s, when systems philosophers and engineers started to think from the perspective of a whole and used this approach, in the industrial area but also in social research. As a modern approach for problem solving was revived in the 90's with Senge's masterpiece The Fifth discipline (Sange, 2006), even though it had been an ancient mode of thinking. We can track systems thinking back to antiquity. Differentiated from Western rationalist traditions of philosophy, C. West Churchman often identified with the I Ching as a systems approach sharing a frame of reference similar to pre-Socratic philosophy and Heraclitus (Hammond, 2003).

When service industry took larger part in a world business of the last two centuries, people started to travel, tourism became one of the fragmental industries as well. Only rich people were able to travel. Nowadays travelling is possible for a majority of population, which made tourism industry the largest complex system in the world of the business systems. Tourism is closely connected to many social, economic, political and other systems. To understand its importance one should think in a mode of connectivity, synergy in a mode of interdependence among tourism elements and influences among each other. The first appearance of systems thinking can be found in the oldest of human societies – the ancient Phoenicians with their cuneiforms, the Egyptians with their pyramids, Greek philosophers and Maya Indians. These are the earliest ancient civilisations of system thinkers. The Mayan numerical system and long count units has been proven as one of the most accurate systems for describing the present and future of the civilization in which we have all evolved. (Jere Lazanski, 2013) The Mayan calendars Tzolkin and Tun, based on mathematics as a strictly rational factor and enriched by intuition, are examples of an evolutionary system of human consciousness. The calendars and their meaning for sustainable society were explained and scientifically proven by Swedish microbiologist Carl Johan Calleman. The calendars presented personal intents of individuals and prophetic meanings for civilization. (Calleman, 2004) Basically, he deciphered the purpose of the calendars, what they represented and meant to the Mayans and how they used them. He discovered that the calendars were timing the development and evolution of consciousness (individual, societal, universal (Calleman, 2009)), which ends with systems thinking and systems approach as worldview and the universal consciousness. Tourism as a multidisciplinary phenomenon and fastest growing industry in the world faces with complex and softly defined problems, which need to be answered by systems approach. Conventional or analytical approach has become an obsolete one and most of all not an adequate tool for successfully solving tourism problems. This is why the paper discusses about explaining conventional or analytical approach and defining systems approach as the one, which is an appropriate approach for use for decision-making in a complex system of tourism.

2. Problem statement: conventional or analytical approach

"Ever since the Industrial Revolution, Western society has benefited from science, logic, and reductionism over intuition and holism. Psychologically and politically we would much rather assume that the cause of a problem is "out there," rather than "in here." (Meadows, 2001)

It's almost irresistible to blame something or someone else, to shift responsibility away from ourselves, and to look for the control knob, the product, the pill, the technical fix that will make a problem go away. This is an old way of seeing. It is comforting, in that the solutions are in our hands but disturbing, because we must do things, or at least see things and think about things, in a different way of seeing and thinking. (Meadows, 2001) When facing problems in contemporary world, one usually thinks that they these problems are not possible or easy to resolve. The reason for this lies in a fact that problems we encounter are complex and they cannot be resolved with a help of conventional or linear thinking. Analysis and linear (dual) thinking play an important role in human consciousness. From a childhood, a man is taught to break apart problems in order to make complex tasks and subjects easier to deal with. But this creates a bigger problem, since he loses the ability to see the consequences of his actions, and he loses a sense of connection to a larger whole. (Senge, 2006) Analytical thinking has been a dominant mode in science for centuries. Nowadays, the majority of society still falls into the trap of analytical thinking, which is short-term thinking without feedback information and knowing the deeper meaning of a challenge. Consequently, people remain unsatisfied, sad and generally in diminished emotional conditions. Everyday stressful situations cause life to be a burden on the individual and consequently to the society. Individuals and thus social groups focus on the present situations, which they see as problems and catastrophes, scandals and shocks, depending the power of media they read, watch are hear. These facts put them into the marginal groups of a society. The awareness of analysis and separation, of judging and praising is so strong that they cannot imagine life without feeling pressure and fear. This described situation has been the reality for the majority of the world for centuries if we follow the pyramid of transformation consciousness explained as Mayan calendrical system. (Calleman, 2009) One doesn't have to explain Calleman's theory on the evolution of consciousness in order to see it. The events of the previous centuries clearly show the power of analytical consciousness, which separated the world into many countries, beliefs, wars…separating it in fear. We need only think of the last century, of wars that were caused by separation and analytical consciousness. The First World War was caused by vested and conflicting interest among decision makers inside ambitions and selfish elites. (Elohim, 2002) The same economic reductionism, consciousness of winning and losing ruled in the next and in the subsequent wars. All these wars and conflicts had something in common: leaders: elites who started them had not seen the world as a whole, which belongs to the universe; they have only seen their separate shares of this world. Their consciousness was strictly analytic and paired with a reductionism which made them "micro-smart" (good at thinking through component parts) but also micro-dumb, since they were not good at looking at the whole world from the astronaut's point of view. (Haines, 2006)

3. The tip of the iceberg as content miopia of analytical thinking

Analytical thinking is thinking without considering the feedback effect. It represents the "iceberg trap", which short-sighted and conventional solutions, when making decisions. The big picture or the picture of

wholeness represents ones' understanding the depth of a challenge and taking into concern all points of view.

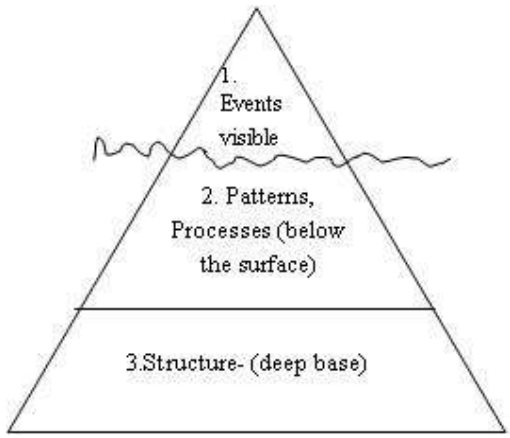

Figure 1. The Tip of the Iceberg as a content myopia

As shown in Figure 1, the trap of short-sightedness is the analytical thinker's failure to concentrate on the 2nd and 3rd, levels of Processes and Structures. What "sinks" the strategy is the same thing that sinks ships: the invisible part below the surface. Following Haines, (Haines, 2006) 87% of an iceberg is below the waterline. Decision-makers should consider the two levels below the surface as those that can sink their strategies and efforts. Analytical consciousness is defined by the observer as: place, time, and observer's reality (Figure 2) If the observer thinks of place, time and observed object, then he depends on calendar and location if he wants to obtain the results of the observed object. If the observer thinks of inputs, process and outputs, he depends on outputs and a wish to achieve the outputs unconditionally by influencing the inputs and the process.

We can recognize the analytical mode of thinking if we observe three independent individuals with their own analytical viewpoints. We get many separated perceptions, which have something in common: they represent separated, (none synthesized) thinking or points of view. They represent separate entities, without any interconnections. Each of them has its own reality, its own consciousness. We can see the linear process of bringing the observer from inputs to the outputs (Laszlo, 2002).

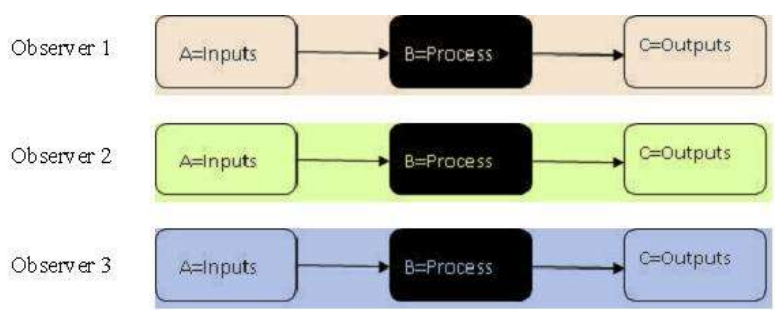

Figure 2. Analytical approach: from the left to the right

An example of the three observers with analytical consciousness can be seen in Fig .3. Each of the observers wants to reach the outputs C; they are parallel in time but in different places and want to achieve different outputs, since they have given different inputs (marked by different colors). They have analytical consciousness, without thinking of interconnectedness and acceptance each other's point of view. None of them thinks of the environment, just about the outputs and the processes.in order to adapt the strategy according to changes in the environment.

4. Complexity of a tourism system

Parts of a system that interact in a nonlinear manner within a system are considered to be a whole and a complex system. Systems approach searches for "(w)holistic" answers, but it also is an important part in the conscious transformation of analytical approach. It represents human awareness of the situation as a whole and it causes a shift of consciousness, in which long term solutions are of greater importance than short-term ones. An individual and later the society's systems awareness, which leads to co-creative actions, must take into consideration the principles of living systems as brought out in Haines (Haines, 2006), where among others a whole is primary. A system cannot be understood by analysis, but by synthesis; looking at it as a whole within its environment and its complexity. Tourism system operates in a non-linear manner and the explanation may come, according to the (Tinsley and Lynch, 2001), by taking into account the complex interactions of the system's elements, combined with the influence of a large set of external factors. The value of the chaos and complexity framework in understanding the development of a destination and the role of small tourism business networks has also been discussed by Tinsley and Lynch (Tinsley and Lynch, 2001). As a complex system, tourism includes many elements: a wide variety of people, institutions, and organizations, which are interconnected, influence each other, have common history, feedback information The symptoms of complexity within the tourism system, as defines (Baggio, 2008) are:

- a large number of elements form the system; considerations and the theoretical work in this
- interactions among the elements are nonlinear field is still in its infancy.
- there are loops in the interactions; systems approach as a more effective framework
- complex systems are usually open
- complex systems have a history, which means that the future bases on the paste and the present
- each element is unaware of the behaviour of the those of being able to understand, for example, system as a whole; it reacts only to information that is available to it locally.

One more implication of the complexity approach is the understanding that all the attempts to maintain stability may only work for a short period of time (Baggio, 2008). Thinking in systems means to connect, to synthesize, to collaborate, to integrate, and to co-create. In spite of the principles complexity, living systems strive to stay in balance. Organisational systems (tourism belongs to it) is the same. Nature is a system, so one must think in systems, for the sake of nature. Systems approach gives us an awareness of co-creation, since it understands that there are no losers or winners but complementary players. And complementary, strong players always co-create the optimal solutions for whatever issues and challenges.

All the challenges were treated and understood in the linear direction. This linearity brought (and brings) a limited point of view, one that doesn't bring us understanding and deeper meaning of the stress, situations, challenges. Man is satisfied

when gets a reward or prize and thinks of the fact that he deserved the award (Jere Lazanski, 2011). The same is with threat or catastrophe, but when it comes to the event, nobody thinks that he or she actually deserved the threat. This is the limitation of analytical approach. It is too simple to solve the complexities of the world. So if we follow Bertalanffy's (Bertalanffy, 1952) thought about complexity, we are forced to deal with systems and wholes in all fields of knowledge, which implies a basic reorientation in scientific thinking.

The transformation from analytical to systems approach brings natural thinking in systems, which always takes into concern the environment and the feedback information, Figure 6.

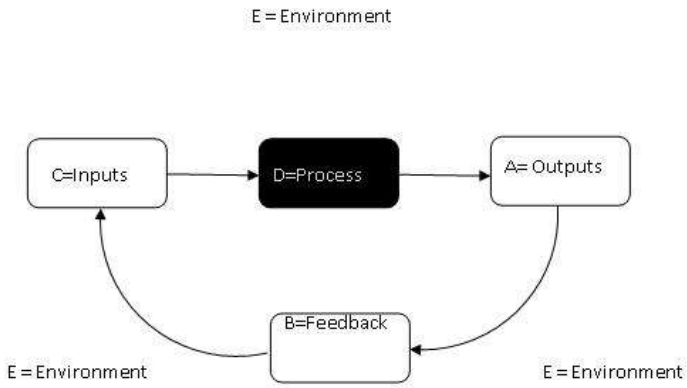

Figure 4. Systems approach: from the right to the left

Transformation from analytical approach to systems approach is visible, since the observer uses as his primary questions the questions about the influence of his vision or (A-outputs) to the environment (E-other people, nature, society), uses feedback information (B-what will my vision bring to the E) and asks himself what will my vision (A-outputs) bring to the environment (E) and what is the current situation (C-inputs, ideas, teams, co-creation) for achieving the (A) and how can I help in the process (B), either with help or without any worries if he cannot influence the process.

5. Systems approach and the systems modelling in tourism

When Bertalanffy published his manifesto of general system theory (Bertalnffy, 1952) and Wiener his book *Cybernetics* (Wiener, 1948) as a methodology for complex phenomena research, systems theory and cybernetics became an important whole in different fields of scientific research. Complex systems are usually understood intuitively, as a phenomenon consisting of a large number of elements organised in a multi-level hierarchical structure where elements themselves could represent systems. According to Blažević (Blazevic, 2007) as a methodology for complex there is special relationship between the tourism system and other economy subsystems. Especially between the subsystems of hospitality, travel agencies, lodging, traffic, road, railway, air traffic, maritime, agriculture, industry, civil engineering, trade, and cultural-entertainment subsystems. Among tourism subsystems, there are certain interdependent relationships, which influence each other. The interdependency of tourism and other

different social subsystems. If there is a minor change in one of the social subsystems, this affects the tourism system. If scientists discover that a certain area in a society is covered with the best preserved dinosaur skeletons and exhibit them in special open museum, tourism demand as well as tourism supply will grow. And vice versa: if there are political disputes in the country accompanied by terrorist attacks, tourism will decline. In creating national tourism strategies, experts and decision-makers should take into concern all these facts. Tourism is part of the real world, which changes by altering relations among its subsystems as well as interactions with the environment within natural law. Systems approach is intended for people who may be wary of the word "systems" and the field of systems analysis, even though they may have been doing systems approach all their lives. I have kept the discussion nontechnical because I want to show what a long way you can go toward understanding systems without turning to mathematics or computers. (Meadows, 2001)

We encounter the methods of systems approach and systems thinking as effective tools in every day's decision-making – in personal and professional lives. Systems thinking differs from conventional or linear thinking for its consensual role when comes to the problem or decision-making. It takes into consideration "wholeness, complexity of a problem and not only one part of it. In systems thinking a whole is of primary importance and the parts are of secondary significance. Vice versa is when we discuss of linear or conventional thinking. According to Stroh (Stroh, 2015), conventional or linear thinking is the basis for how most of us were taught in school and still tend to divide the world into specific disciplines and problems into their components under the assumption that we can best address the whole by focusing on the parts. Conventional (linear) thinking is not suited to address the complex problems. The answer for solving complex problems of complex systems lies in a shift of thinking: from conventional (linear) thinking to systems (integrative) thinking. Systems thinking is thinking in terms of relationships, patterns, contexts and presents the new concepts of life. (Capra and Lusi, 2014) It gives us a holistic perspective for viewing the world around us and seeing ourselves in the world. (Jere Lazanski, 2009) It describes environment as an important element of modern social and economic systems. The feedback information, which is a typical element of systems thinking presentation graph, regulates positive and negative influences in a frame of system dynamics. We can show systems approach through a qualitative influential causal loop model, which represents a complexity and interdependency of the tourism system and its subsystems or elements.

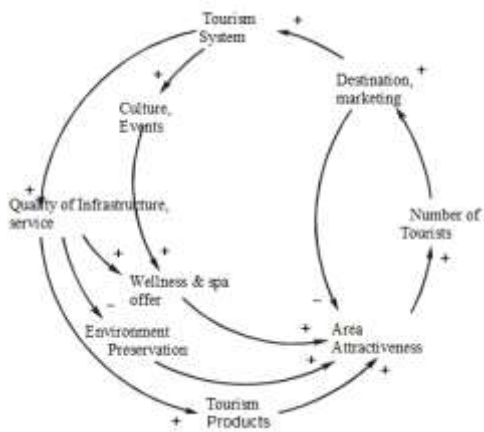

Figure 3. Model of Tourism System Influence

The diagram shows tourism system, which scenarios influence quality of tourism infrastructure and service (+), these influence positively upon tourist product (+), tourist product influences attractions offered by tourism (+). At the same time they have positive influences (+) on wellness and spa offer, which influence area attractiveness (+) and the number of tourists (+). The number of tourists influences (+) tourism destination and marketing (+) and these influence

tourism strategy ideas and scenarios (+). Culture and events influence (+) wellness and spa offer, which makes the area more attractive (+). Attractions influence the number of tourists (+) these influence the tourism destination (+), the destination influences the attraction quality (-). Tourism infrastructure and services influence environment preservation, (-), which influences tourism area attractiveness (-). Positive causal loop circles mean growth, yet it must be said that every aggravation follows a decline in growth. Qualitative (CLD) model is usually followed by quantitative (SD) model, which is presented in figure 4.

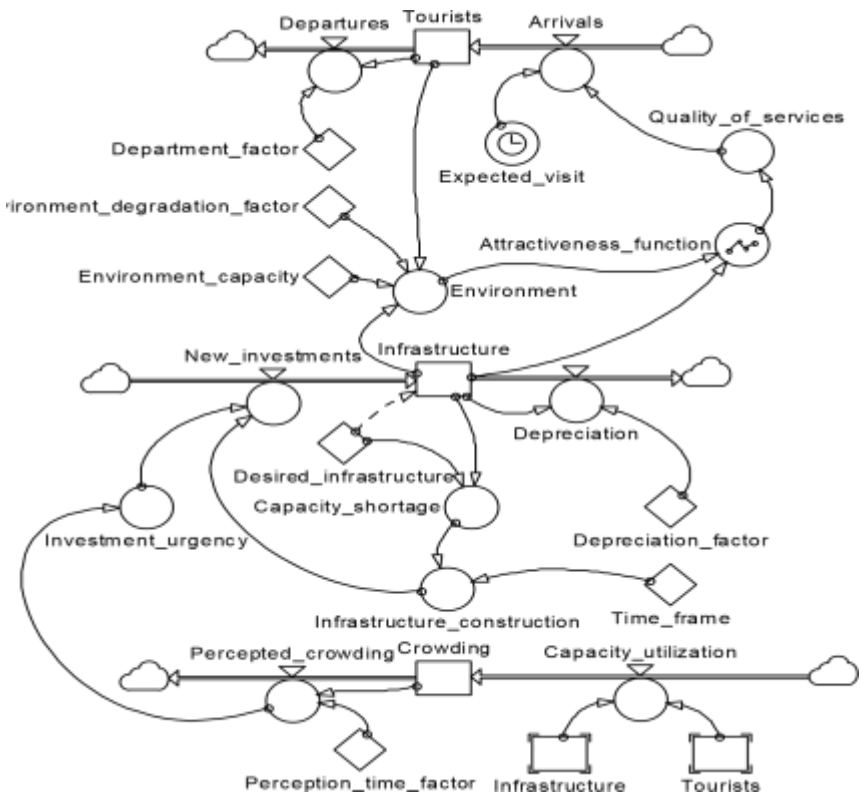

Figure 4. SD diagram of a tourism simulation model

The diagram in frame of system dynamics on figure 4 shows the structure of a tourism system macro-model. From this diagram, one can derive the dynamic equations, which are necessary for a computer simulation. The parameters are not quantitatively evaluated, since there is much work to do with analysing the details of a model. This is only an answer and a presentation of possible results.

In this model are included a lot of variables. For quality and resilience purpose are important following factors:

- quality of services,
- environment,
- infrastructure construction.

A quality of services especially in tourism is very well researched (Arsovski, 2006) with different aspects as: (1) quality of tourist product, (2) quality of tourist process, (3) transcendent quality of tourist products and events, and (4) quality of based on value of tourist product. All previous emphasized aspects are described in works of (Juran,

1951; Parasuraman *et al.*, 1995; Oakland and Tanner, 2008; Sumanth and Wardhana, 1993; Foster, 2004; Tadic *et al.*, 2013; Arsovski *et al.*, 2009; Nestic *et al.*, 2015; Arsovski and Arsovski, 2011).

An environment factors are related to business environment. In proposed model it is emphasized by: (1) environment degradation factors (2) environment capacity, and (3) environment infrastructure.

Infrastructure construction in proposed model has impact on new investments and has influence on quality economics Sumanth and Wardhana, 1993; Arsovski, 2002)

Resilience of tourist organizations I srelative new concept that covers risks, vulnerability, capability and capacity of interval resources, emergency resilience and other factors depend on chosed model (Arsovski *et al.*, 2015; Arsovski and Perovic, 1994; Yang, 2008).

With two next sub-models (quality and resilience) we make more complex turist system, but we have opportunithy to simulate its behavior more precisely.

6. Conclusions

In this paper, the problem we discuss is pointed to analytical approach and analytical thinking and suggested solution through a new approach in one of the world largest systems, the tourism system. It points a transformation to systems approach and systems thinking. Handling independent elements is the essence of analytical approach and analytical thinking. (Gharajedaghi, 2006) Understanding interdependency requires a way of thinking different from analysis; it requires systems approach and systems thinking. Analytical thinking and systems thinking are quite distinct. Analysis is a three step thought process. It takes apart that which it seeks to understand, then attempts to explain the behaviour of the parts taken separately, and finally it tries to aggregate understanding of the parts in to an explanation of the whole. Systems approach uses a different process. It puts the system in the context of the larger environment of it is a part and studies the role it plays in the larger whole. The paper also presents qualitative systems modelling in a form of causal loop diagram and quantitative modelling in a frame of system dynamics. Both models represent influences and co-dependency of tourism system elements; firs one in descriptive manner and the second one in

Systems approach requires an excellent knowledge about a whole, yet it must take into concern analytical thinking. Both will come to be thought of as twin components of scientific thinking. (Checkland, 1999)

Commitment to systems approach is optimal, unconditional and not aggressive. It is a part of the individual who follows his inner voice and creates his own inner harmony, which shines outwardly. It is the commitment to the wholeness that fits to the feeling of its detachment and the transformation of consciousness, which leads to knowing “the Whole”. This represents a person’s awareness of being a part of a whole, a part of a planet interconnected with other people in a mutual co-creation process. The big picture is actually a “view from the space”, which clearly shows the interconnections among all elements of our planet. It explains a systems thinking and the world with all its living and non-living organisms. It is important that every single person has an awareness of being a part of civilization, humanity. In the paper we presented: Generality and reasons for differences among methodologies for descriptions of complex systems in frame of system dynamics and importance of context dependent modelling, which is a range of definitions for problems, methods and models, which are in dependency of the organisational problem and experiences of its participants. Plurality of methodologies is legitimate. The paper shows a way of transmission from verbal problem description to causal loop diagram, which is nothing else but an enriched diagram of a

directed graph, which enables a categorical debate of a problem. For an illustration of a methodology, tourism as a complex system has been modelled and analysed.

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