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Systems Approach has been accepted within natural sciences since Ludwig von Bertalanffy published his manifesto of general system theory (Bertalanffy, 1952) and Norbert Wiener his on Cybernetics (Wiener, 1948). The intention of general systems theory and cybernetics is the 'ontology' of action, which is shown by feedback information. Its goal is to find a method to predict the consequence of a decision-making action. Industrial engineering recognised it, when Forrester published the work *Industrial Dynamics* (Forrester, 1961) and social sciences rediscovered it with Senge's work on the learning organisation - *The Fifth Discipline* (Senge, 1990). Systems Approach is a methodology for complex phenomena research, theory and cybernetics, the disciplines, which play an important role in different fields of scientific research. Here we will present the tourism system from a systems point of view with special emphasis on religious tourism.

Key Words: Systems Approach, systems theory, religious tourism, holistic processes

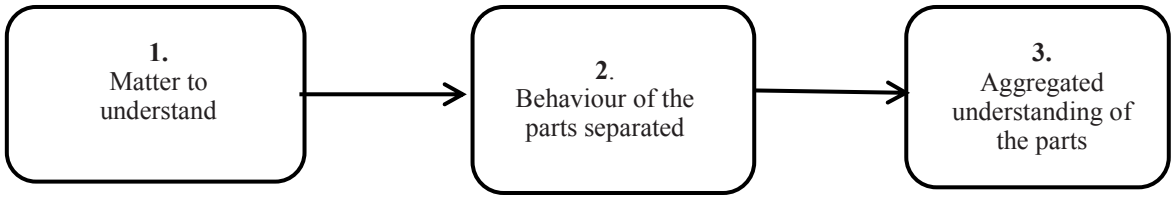
Introduction

Systems approach has been accepted within natural sciences since Ludwig von Bertalanffy published his manifesto of general system theory (Bertalanffy, 1952) and Norbert Wiener his on Cybernetics (Wiener, 1948). The intention of general systems theory and cybernetics is the 'ontology' of action, which is shown by feedback information. Its goal is to find a method to predict the consequence of a decision-making action. Industrial engineering recognised it, when Forrester published the work *Industrial Dynamics* (Forrester, 1961) and social sciences rediscovered it with Senge's work on the learning organisation *The Fifth Discipline* (Senge, 1990). Systems approach is a methodology for complex phenomena research, theory and cybernetics, the disciplines, which play an important role in different fields of scientific research. Here we will present the tourism system from a systems point of view with special emphasis on religious tourism.

Analytical (Conventional) Approach and Systems (Holistic) Approach to Tourism System

Some of the most relevant paradigms to analysis have been described by Rosenhead, (1989) and Mulej (1992), including: soft analysis, hard analysis of a system, critical thinking, strategic options development and analysis and, dialectical theory of system. The Analytical (conventional) Approach bases on analysis as 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 (Figure 1).

Figure 1. Analytical –three step thought process



Systems approach uses a different process. It puts the system in the context of the larger environment of which it is a part and studies the role it plays in the larger whole. The parts are no longer the primary focus. The parts are essential but what is more important is the interrelationship between the parts as they work together to fulfil the purpose of the whole system. Systems approach is optimal for understanding interdependency, which requires a way of thinking which is different from analysis; it requires systems thinking.

Religious tourism is a part of larger system, the tourism system. The description of the system depends on the specific goal and point of view of the researcher. The word 'complex' is used only to point out the fact that the problem treated here cannot be expressed only in hard (quantitative) relations and that most relevant values are qualitative. We consider complex systems as networks created of many components, which interact among each other in a nonlinear way; they may evolve through self-organization, such that they are neither completely regular nor completely random (Sayama, 2015). With a conception of complex systems, we also present a system within which a complexity of interaction among system elements plays a main role. These elements are systems themselves and for this reason the behaviour of a system as a whole can hardly be predicted: the system of systems, which exchange energy and information with their environment while in transit, inflected by internal and external influences. Organisational systems, among them the systems of tourism, are complex because of the existing relations and nesting of its subsystems. This is represented in Figure 2.

The systems within a system of tourism nest in each other, which means that they represent subsystems at the same time as they represent systems as wholes. The interdependency and relations among the entities of these subsystems is far more important than independent systems, especially between the subsystems of commercial, health, congress, sport, cruising, religious, cultural, farm, and event tourism subsystems. Among tourism subsystems, there are certain interdependent relationships, which influence each other. If we map the tourism system to the national or international destination we reach a level of a system, which encompasses a wide variety of partners, branches and institutions, and create a complex system as such; with all interconnections, interdependency, and nesting in each other (dependent on a size of a subsystem).

Figure 2. Interdependency of the tourism system and other tourism subsystems

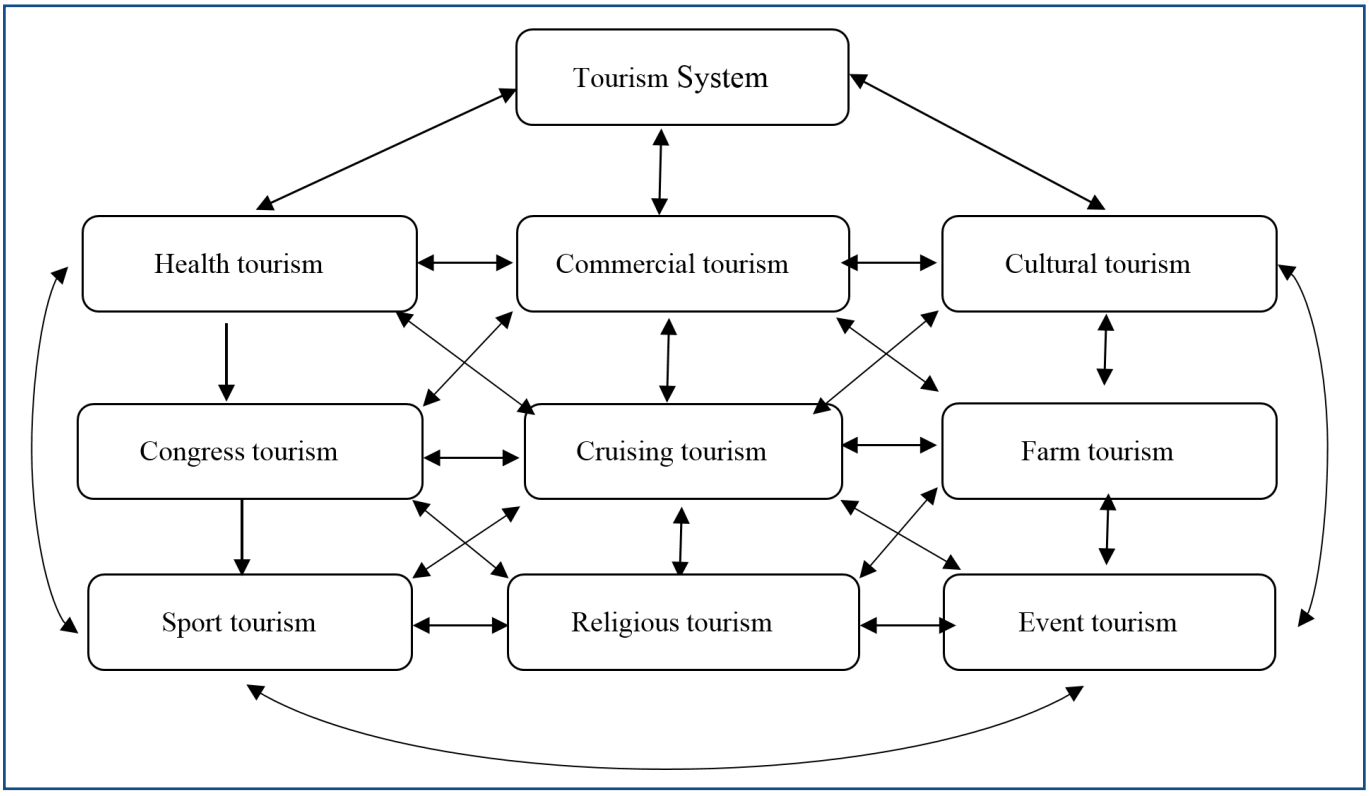
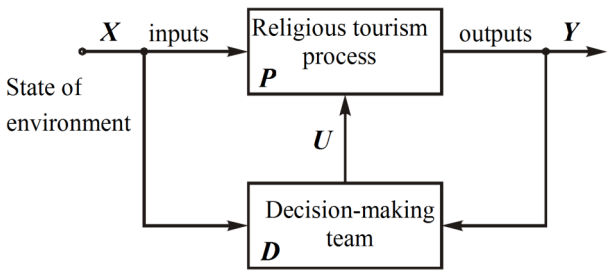


Figure 3. General model of religious tourism as goal oriented system



Religious Tourism as Goal Oriented System

A society is a real world, which changes by altering relations among its participants as well as interactions with the environment within natural tourism. Learning and experience through decision-making provide development and growth that are observed through evolution. Evolution of society and experiences as part of the past and the anticipation of the future cause these systems to grow and develop, with the environment as the restriction. Thus, we can say that the tourism system is as its subsystems, dynamic. Regulation is necessary but far away from being sufficient. The most important facet is the strategic vision of a development and the way the system environment influences prediction. For this reason tourism systems can be defined as being slightly different, in the way that inner causes of system behaviour are emphasised. Usually they are called management subsystems. We can describe the religious tourism system with a model, which is an idealized and simplified image of a real situation or phenomenon and contains only important quantities and their functional dependencies. The model, therefore, is an attempt to identify key variables in a situation and the relationship that exists among them (Kljajić, 1998).

In Figure 3 we define a general model of goal-oriented system with a pair **(P,D)**. **P** represents managing process in a religious tourism system, **D** represents the managing subsystem. Loop **P→Y→D→U→P** represents feedback information, which functions on the cause consequent principle; therefore we can call it reactive control. For small perturbances such control is satisfied. For decision making in the religious tourism system, information from the environment is necessary. Chain **X→D→U→P** provides feed-forward information, which represents the anticipation of the future state of the environment. It is an important part of the strategy of goal-oriented systems.

A decision-making team consists of those experts and people who create goals and take responsibility for a system's development. The team's knowledge and consciousness depend on inter-relationships and the organisation of technical and natural parts of subsystems for achieving quality goals and functioning.

Model of Religious Tourism Vision

The number of works dedicated to the different models and methodologies devoted to social, economic and natural areas is very high. These include: System Dynamics (Forester, 1961), System Thinking (Senge, 1994), Autopoietic System (Maturana, 1998), Living Systems (Miller, 1978), Viable Systems (Beer, 1959), Anticipatory Systems (Rosen, 1985) as well as others. Models in the frame of systems dynamics search for optimal solutions and answers from right to left as presented in figure 4.

The primary step of the system approach starts at A: the outputs or vision of the optimal religious tourism vision in legislation. The expert group uses as primary

Fig. 4: A Model of Defining Religious tourism vision

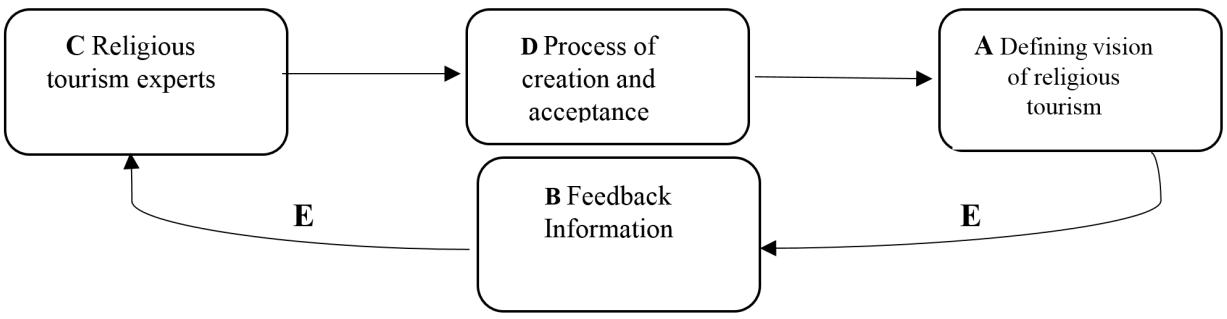
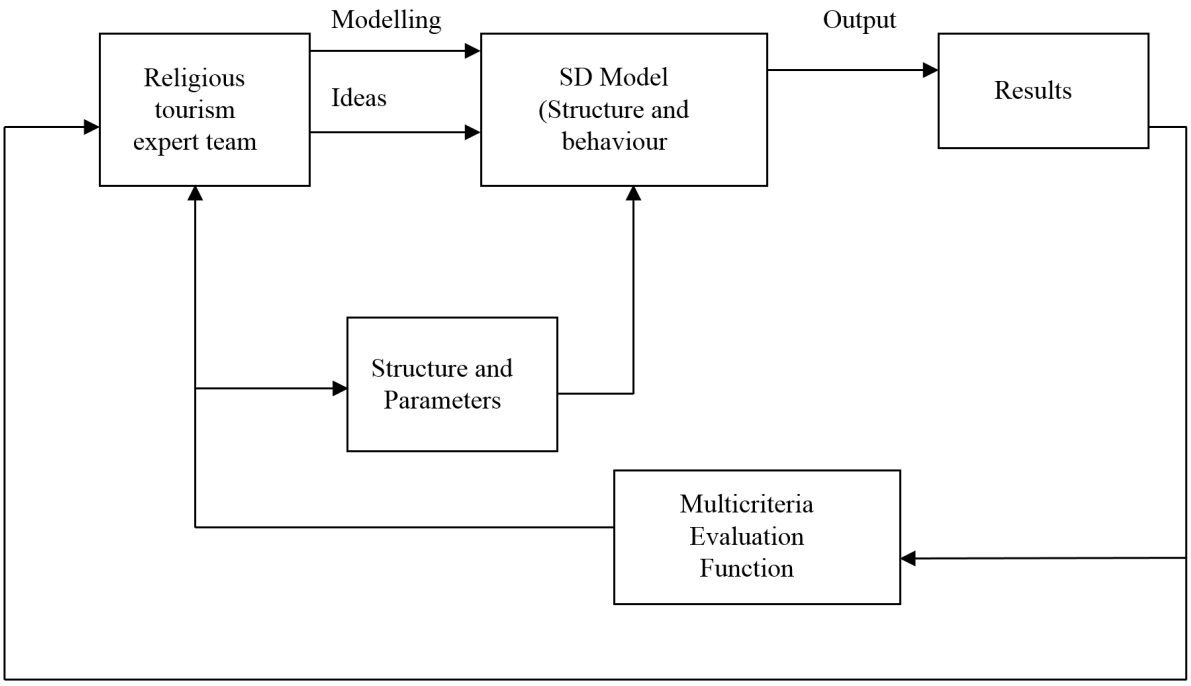


Fig. 5. The principle scheme of simulation methodology for decision-making support



enquiry, questions about the influence of a vision that results in optimal tourism achievements (outputs, A) to the environment (E - other people, nature, society), uses feedback information (B - what will the vision of defined bring to the E) and asks:

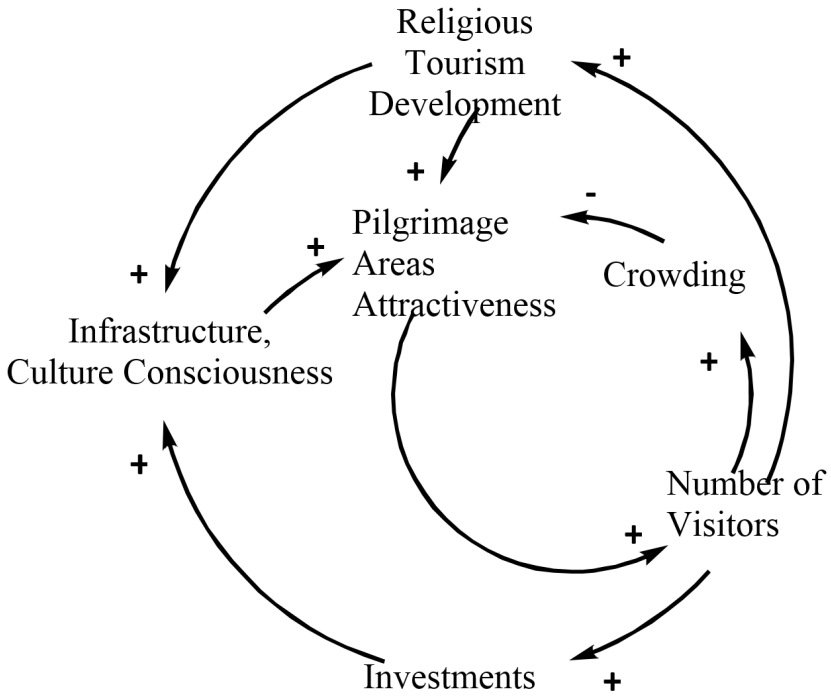
1. What the vision (A, outputs) will bring to the environment;
2. What the current situation is (C, inputs, ideas, teams, co-creation) for achieving the outputs (A) and;
3. How they can help in the process (B) either with help or without any worries if they cannot influence the process.

In order to avoid the trap of the simplicity of systems thinking, we can build a simulation model of effective decision-making in which we try to implement the optimal systems solutions.

The model discussed above (Figure 4) requires decision-making given by a group of experts for religious tourism. Figure 5 presents the religious tourism expert group as a part of the religious tourism process, where modelling and ideas about religious determination represent a knowledge-capturing process in the form of the structure and behaviour of the model. Once the model is defined and validated, experimentation with different scenarios is possible. The religious tourism expert group determines the set of different ideas, which represents possible future activities in the real system. The results gathered as the output of the model are evaluated with the multi-criterial evaluation function. At this stage, many different multi-criterial evaluation methods may be used from weighted average (Vincke, 1992) to the Analytical Hierarchy Process (AHP) (Saaty, 2012) and Expert Systems (ES) (Rajkovič and Bohanec, 1991). Information feedback provides the expert group with the possibility of creatively determining a new set of ideas on religious and multi-criterial evaluation functions relating to the given situation. Simulated and actual performances of the system are compared in order to adapt the strategy according to changes in the environment.

The systems thinking solving method with simulation model follows standard steps: state analysis, development of causal-loop diagrams, writing of the model's equations and model implementation. Particular scenarios that form and determine a tourist market in a certain environment are tested on a simulation system. A simulator is connected to the GSS (Group Support System); the participants using GSS work directly with the system simulator. A system simulator is connected to a database, which is necessary for simulation model activation. Simulation results are then evaluated both with the group decision-making support system and with expert systems. In all

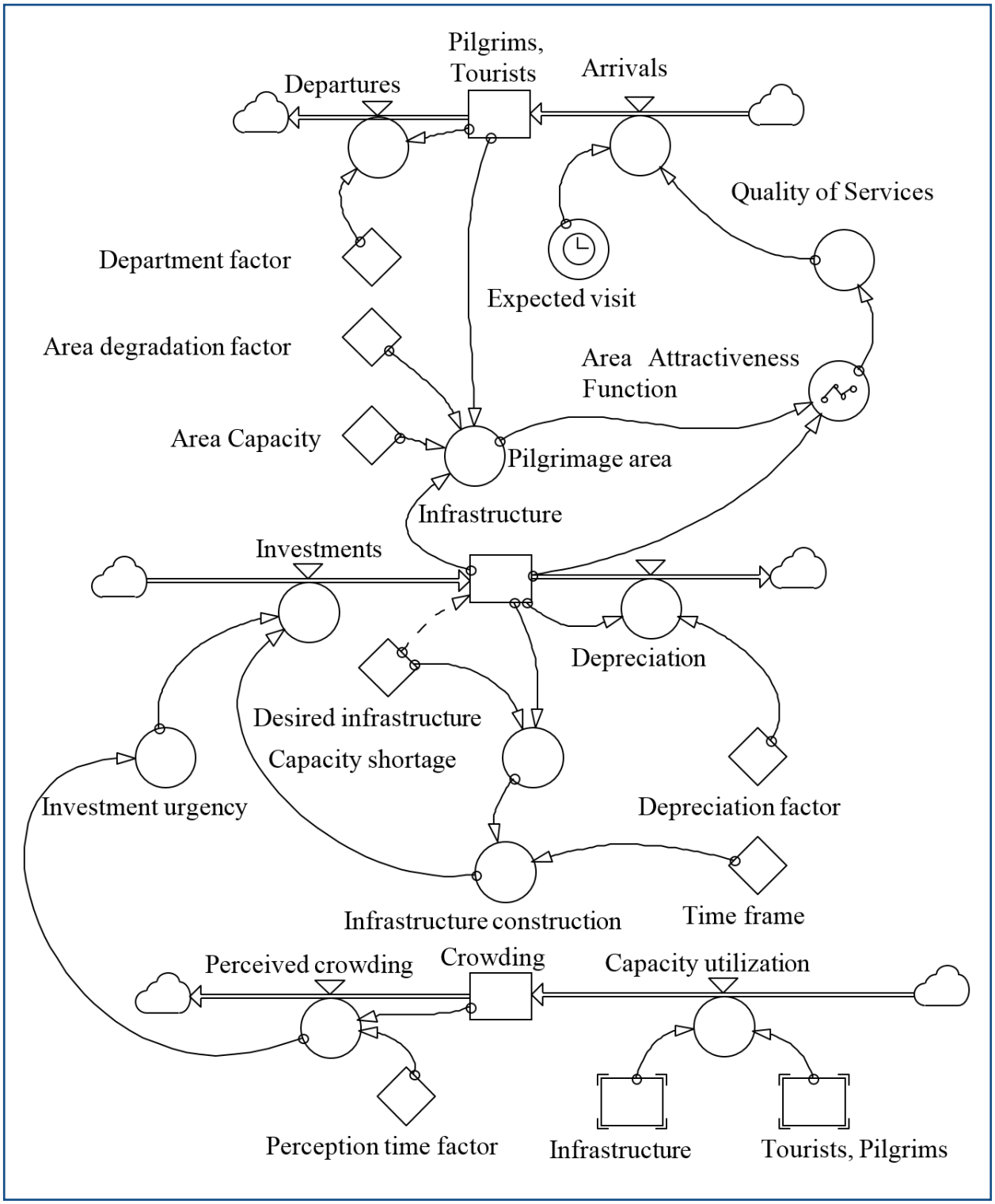
Fig. 6. CLD (causal loop diagram) dependency of religious tourism development and pilgrimage area attractiveness, number of visitors, infrastructure, and investments



of this, the understanding of the system increases. With the described model, the experimental loop on a simulation model has been finished with the help of the system simulator and scenario ranking. The elements of the decision-making support system are Powersim, a tool for the construction and use of a simulator; Ventana Group Systems, the Ventana group working support system; DEX, a shell of an expert system expert; and Expert Choice, evaluation with the AHP method. Since working with a group decision-making tool is anonymous, it stimulates creative thinking, which enables a greater flow of ideas and reduces unwanted influences. The participants become more relaxed, since no one knows where the ideas come from and thus, creativity is released; this simply would not be the case in the more 'classical' ways of working. The work time decreases and the efficiency of participants increases (Jere Jakulin, 2017). The final result is better, as the decision becomes a group decision within which, conflict between polarised groups is minimised and a consensus is achieved for the development of further qualitative and quantitative systems models.

Fig. 6 presents the systems diagram, which can be described as follows: Religious tourism development (+) influences in the same direction onto pilgrimage areas attractiveness (+), which influences upon number of visitors, (+), number of visitors influences growth of investments into infrastructure and culture consciousness (+). On the other hand it can be said: more visitors (+) causes environmental damage (-), which is a reason for decline of pilgrimage area attractiveness. At the same time, crowding (+) causes detours, traffic congestion, drivers' nervousness, accidents, regrets for making a decision and visiting this of area (-). From these qualitative descriptions the expert team can see what must be taken into consideration to build a quantitative diagram in a frame of systems dynamics presented in Figure 7, which presents the 'real world system'. The 'model' is perfect in the sense that its nonlinear stock-flow-feedback structure, its parameters, its distribution of random varieties, and its initial values, are identical to those of the 'real world system.' The 'model' is thus more perfectly specified than any actual social system model could ever be in the true real world. Stocks or Levels show a variable type and a model object in Powersim models, used to represent the state variables of a system. Levels accumulate connected flows. Array Stock has one dimension with different elements, and flows in a Powersim model represent the transport of quantities to, from, and between levels, whereas connectors are links to establish an influence from one variable to another.

Figure 7: Interconnection of decision-making support system parameters



The model shows the structure of a religious tourism model. From this model, we can derive the dynamic equations necessary for a computer simulation, which represent a presentation of possible results.

Conclusions

Systems approach has become a necessity in contemporary life, which we see as a modern complex system composed from a variety of other systems and their elements. In the paper we discussed the tourism system and its elements or subsystems of religious tourism and evaluated it from a systems point of view. We described the religious tourism system as a so called soft system phenomenon, where people with their actions, knowledge, characters play the main roles which represent a complex system of a society. As we reach certain levels of complexity, we must search for an optimal methodology to find an optimal way of dealing with this complexity. The methods of systems dynamics, systems thinking and modelling are some of them. In the paper we presented plurality of methodologies as legitimate. A way of transmission from verbal problem description to causal loop diagram, we represent with causal loop diagrams of a directed graph. This enables a categorical debate of a problem. For an illustration of a methodology, we discussed religious tourism as a goal oriented complex system. Therefore, the anticipated system is much closer to describing the essence of complex systems behaviour. However, the influence of the observer (experts' team) in the process of modelling the complex system is of primary importance. In literature, this problem has not been sufficiently considered. This paper discusses the method of describing and modelling the complex tourism system from the systems point of view where the team of experts play an observer and decision-maker role. With a systems perspective, a person or a team as an observer of a complex problem turns away from the emotional world and accepts the virtual worlds of models, which brings them closer to reality in its optimal form to serve the needs of present and future science.

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