Editorial 9/2005

Fast progress in the information technology fostered new ways of organizing enterprises, but at the same time demand changes in management as well as in decision-making. Business process becomes complex and e-global. In such turbulent environments the e-decision paradigm represents the prevalent force of development. Efficient computer systems and program languages in e-environments make possible the integration of a large variety of new simulation paradigm and artificial intelligence in an integral system for decision making support and mastering of organizational processes.

The aim of the special issue is to present a part of research activity of Cybernetics and Decision Support Laboratory at the University of Maribor, Faculty of Organizational Sciences in the field of complex systems modeling and simulation. The special issue includes papers that deal with the development of methodology, modeling tools and practice for decision assessment in regional planning, production planning, control and optimization, social dynamics research and living laboratory development.

First paper entitled: "System Dynamics Model of The Canary Islands for Strategic Public Decisions Support" centers on the problems of decision making and decision support related to strategic public decisions. The methodology considers the fact that strategic decisions involve a large breadth of variables, qualitative and quantitative; and that they imply distributed and remote interaction between different actors. The causal loop diagram expressed as directed graph was explored in the building of qualitative models preceding system dynamics for the development of a simulation model. Variables were identified which affect the sustainable improvement of the quality of life in the Canary Islands. The problem addressed considered the analysis of the driving- dependent forces and systems dynamics.

Paper entitled: "Development of Simulation Model of the Canary Islands for Strategic Decision Making" deals with the application of system dynamics model for decision-making, related to strategic decisions for the development of the Canary Islands. The quantitative model incorporates relevant variables, which affect the sustainable development of the quality of life on the Canary Islands. The Following sub-models were considered: Population, Tourism market, Agriculture, Environment, and GDP. The program package Powersim was used to build the simulation model. Several strategic scenarios are described and their dynamic response was analyzed. Presently the model is in the validation phase. The initial results are promising according to the positive validation results.

Paper entitled: "An Intelligent Decision Support System (IDSS) for Public Decisions using System Dynamics and Case Based Reasoning (CBR)" presents the design of an IDSS that allows the decision makers to identify key issues that matter for the future of a social system and helps them to improve the policy-making processes. It combines IA techniques with qualitative models and Systems Dynamic Simulation. Authors propose a methodology divided into three phases covering a) modelling and simulation of dynamical system, b) application of CBR (Case Based Reasoning) technique, where each case is defined by a set of norms, cases and indexes, problem, solution and explanation and c) determination, explanation and presentation of different solutions to the decision makers. Important finding of the authors is that the IDSS is an instrument to promote and facilitate the attainment of a coherence and consensus between the decision makers.

Paper entitled: "Simulation with cellular automata - diffusion of electronic commerce in small organizations" the cellular automata based simulation model of electronic commerce diffusion in small organizations is described. The focus and purpose of this research was to study long-term influences on the electronic commerce caused by organisational characteristics in small organisations. The study founded that the most influential factor of diffusion is »management support«. The dynamics of electronic commerce introduction and usage in non-innovator organisations were influenced significantly by the verbalisation process through business partners. The developed methodology shows new approaches for cellular automata usage in organisational systems study.

Paper entitled: "Mobile agents and xml for distributed simulation support" mobile agents and XML for the connection of simulation models and data resources over a communication network are presented. Authors have developed two types of agents: a mobile agent that functions as a mobile server for on-demand queries in SQL and transformation of results into XML compliant documents and a stationary agent functioning as a client for query forwarding and conversion of resulting XML documents into CSV files. Authos have established that software agents can be used to connect distributed simulation models, developed with different general purpose simulation tools and databases, thus improving the connectivity and usability of simulation models in distributed information systems.

Paper entitled: "How to Perform a Simulation Project -An Example of Scheduling with genetic algorithms and visual event simulation model" describes the application of simulation methodology in the connection to the artificial intelligence. Authors emphasize that by computer and software development, simulation has become widespread and user-friendly tool that should be applied at solving complex organizational problems. The case of simulation application is described where optimization of production system was conducted. In this article authors will point out the problems that occur at simulation methodology implementation and stress the benefits of simulation. As the case of simulation project performance, scheduling problem by means of VIM and GA is demonstrated.

Last paper of this issue: "Presentation of an alternative criteria research methodology for selecting a new product" presents the methodology used in the research of a complex problem in business decision-making: determining the relative importance of criteria when selecting a new product. It facilitates getting recommendations for defining the relative importance of criteria and subcriteria for selecting a new product depending on the current situation in the company. By applying proposed methodology, dependence of the criteria relative importance for selecting a new product on the company's degree of success can be determined.Applied procedure has importance because of its universality, given that it can also be applied to the research of the criteria for similar decision-making issues, with or without adequate adaptations.

Guest editors:
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