GUEST EDITORIAL

ON THE "MODELLING OF BUSINESS, INDUSTRIAL AND TRANSPORT SYSTEMS" INTERNATIONAL CONFERENCE

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The international conference "Modelling of Business, Industrial and Transport Systems", held in Riga (Latvia) during May 7–10 in 2008. The conference was organised by Transport and Telecommunication Institute in co-operation with the following institutions: Kaunas University of Technology, Vilnius Gediminas Technical University, Latvian Operations Research Society, Telematics and Logistics Institute, Latvian Transport Development and Education Association, Lithuanian Operational Research Society within EURO (LitORS), The Association of European Operational Research Societies, Latvian Simulation Society and Academic Park, Latvia.

The conference was hosted by Riga's Transport and Telecommunication Institute. Chairmen of the conference were: Prof. Eugene Kopytov (Chairman of Programme Committee), Prof. Igor Kabashkin (Chairman of Organising Committee) and Prof. Irina Yatskiv (Co-Chairman of Organising and Programme Committee).

Conference International Programme Committee included leading scientists from Belarus, Estonia, Germany, Israel, Italy, Latvia, Lithuania, Poland, Russia and USA.

The conference continued previous traditions of organising Operational Research conference in one of the Baltic States. The previous five conferences were held in Latvia (Riga, 1996, 2000), Lithuania (Kaunas, 1998 and Vilnius, 2003) and Estonia (Tallinn, 2006). The conference was focused on various aspects of mathematical modelling, simulation, optimisation and information technology. Because of a wide and growing use of Operational Research in science, engineering, economics, transport and industry it was essential for students, scientists, researchers and practitioners as well to develop a better understanding of Operational Research methods, to propose enhanced decision-making techniques using recent advancement in mathematical optimisation and to point out the way to future research on improving

and extending Operational Research algorithms and software. Another important objective of the conference was to provide an occasion for fruitful interchange of ideas of the researchers and for establishing better contacts between specialists from different countries. The list of participants of the Conference includes academic staff, Doctoral students, researchers and practitioners from Azerbaijan, Germany, Israel, Latvia, Lithuania, Russia and Poland.

In this special issue selected Conference papers on the technological and economic development of economy are presented.

Irina Arljukova in her paper "Problems preventing from efficient investment activity of air companies" deals with the problems of investment development of air companies. The author examines the aspects of modelling the investment solutions under conditions of developing aviation business, giving methods of modelling of demand, including those based on dynamics of macroeconomic indicators. Arljukova's article contains the problems relating to assessment of macroeconomic risks, using models of assessment of discount rates. Variants of assessment of currency risks in the process of evaluation of efficiency of international investment solutions are analyzed as well.

Elena Dubra and Mara Gulbe in the paper entitled "Forecasting of labour force demand and supply in Latvia" analyses the problems of Latvian labour market and its possible development. An econometric model for labour force demand and supply forecasting is elaborated in the paper. It comprises 120 professions, 37 aggregated groups of professions and covers time period from 2007 till 2030. The results of the quantitative and qualitative Employers' Survey are analysed and taken into account. The novelty of this research lies in the complex approach to the labour force demand and supply analyses and to the forecasts to the Latvian economy in general and for its 15 separate sectors.

The authors' team, consisting of Dale Dzemydiene, Saulius Maskeliūnas and Ignas Dzemyda, in their paper "Interoperability of information system components for monitoring the sewage and intelligent analysis of water resources" discusses the problems of development of component-based architecture of integrated decision support system that possesses the monitoring and intellectual analysis of water management sector. Such investigations are made according to the requirements of European Union Water Framework Directive, Sustainable development Directives and EIONET ReportNet infrastructure. The main components of decision support system development in environment evaluation sector by using different knowledge modelling and web service development techniques are analyzed in this article. The structure of Water Resource Management Information System becomes the core of decision support system in which the creation of web services based on the interoperability of distributed data warehouses and geographical information system means is realized. The solutions of the interoperability tasks are demonstrated by architectural design decisions of the system.

The paper "Simulation model for supply chain reliability evaluation" by Ruslan Klimov and Yuri Merkuryev investigates problems related to supply chain risk identification and simulation-based risk evaluation. The paper is divided into two logical parts. The first part represents earlier research about risk recognition within the sphere of supply chains. The distinction between terms "uncertainty" and "risk" is discussed. Based on the predefined supply chain functions, additional risks connected with supply chain reliability are recognized.

Then, a conception of simulation-based risk evaluation approach is discussed. In the second part of the paper, a numerical example is provided, where a simplified supply chain system is defined and corresponding risk evaluation is performed.

Rostislav Kopitov and Lev Faingloz in their paper "Ways of transforming aims into results by successful companies" examine a combination of coupled managerial approaches directed to designing a full-functional system of improving the business functioning. A possible improvement could be achieved on the basis of the business processes uninterrupted monitoring. Such a system is oriented to the establishment of the integral analytical business platform for providing the coordinated objectives setting, timely revealing and neutralizing the unforeseen events, decision making at different levels of an organization.

The paper "PLA based formalization of business rules and their analysis by means of knowledge based techniques" by Henrikas Pranevičius and Germanas Budnikas presents the approach that applies knowledge engineering techniques for representing and analysing business rules. Business rules are represented by production rules using concepts of a state-based piece-linear aggregate model. A knowledge base of the business rules is analysed by checking its consistency (static properties) and dynamic constraints (dynamic properties). The analysis is performed by applying methods for decision table verification and reachable state validation as well as supporting tools. The authors' proposed approach is illustrated by an example of insurance company services.

In Henrikas Pranevičius' and Kristina Sutiene' paper "Copula effect on investment portfolio of insurance company", the composition of investment portfolio in insurance business was considered as the problem of dynamic decision-making under uncertainty. The performance of two alternative approaches applied for the decision-making under uncertainty was compared. One of them allows evaluating the company's strategy and is technically based on stochastic simulation. The other approach generates a strategy of the stochastic optimization model. The activity of insurance company is affected by many risk factors, thus the multivariate uncertainty space, where the correlations among these factors are possible, can be constructed. For their dependency structure, the alternative method – copula function – is employed, which allows to model the non-linear dependencies between the correlated stochastic variables. The effect of different copula functions on the composition of investment portfolio is investigated.