

FOREWORD

The monograph *Aspects of Production and Management Engineering* is an attempt at a scholarly debate on the operation of modern production and services enterprise. The volume just presented to the reader includes selected results of research carried out at Polish academic centres in 2011. The results included relate to both system-related problems and specific examples of practical solutions.

The volume opens with a paper by Mirosław Zaborowski. The author proves that in the synthetic image of data structure of an EPC II system, each structural attribute of information items can be classified in one of the three overall dimensions: knowledge on processes and resources, enterprise organisation and execution identifiers for specified business processes. The EPC II theory might successfully be applied to solve difficult problems of business process control, including the creation of a universal trunk system for process management and control at enterprises and to automated adaptation of management system software to changes in business process structure.

The team headed by Jan Werewka carries research into the issue of the development, production and implementation of corporate software. The team's paper presents a methodology designed to develop corporate software based on synergies between enterprises. The methodology is intended to integrate the best solutions in corporate modelling, service-oriented architectures and software implementation models. Relations among selected entities in the environment of developer companies are also discussed by Justyna Grześ-Bukłaho and Wiesław Matwiejczuk. Their paper presents the role of a developer's relations with entities of its both internal and external environment in the process of establishing and maintaining good reputation.

The next three papers report on attempts to solve flow control problems. Marcin Woch and Piotr Łebkowski present an implementation of a solution search method for a bi-criterion vehicle routing problem. The proposed algorithm is based on the sequential simulated annealing heuristic. A new solution space search function is proposed, supporting a very quick

identification of solutions close to optimal ones. The authors repeated the best results for numerous of Solomon's tests concerning the VRPTW problem and Cordeau's tests concerning the MDVRPTW problem, and in two cases, they even established the world's new best results.

Dariusz Dorochoewicz devotes his paper to discussing methods of increasing the performance of robotised manufacturing workstations. The author proposes appropriate arrangement of robotised technological operations. He presents and compares with each other two algorithms supporting solving the travelling salesman problem. Katarzyna Z. Gdowska and Roger Książek have developed potential optimisation criteria for tramway timetable, as well as presented simulation results for most typical cases together with critical analysis thereof.

Next papers concern economic aspects of enterprise operation. Alina Dyduch discusses assessment measures for financial management at insurance companies, with a special emphasis on financial security ratios and the financial standing of the insurance sector in Poland in 2006–2010. Dariusz Fuksa explains the complexity of the problem of determining the breakeven point for multi-product manufacturing, presents his own approach to determining the BEP for hard coal mines, as well as an assessment method for the effect of fluctuations in hard coal demand on the breakeven point based on an example involving an actual hard coal mine. Rafał Sieciński conducts an analysis of a qualitative capacity of a process and presents a verification method for a qualitative capacity of a process where the process is assessed based on alternative quality assessment.

Beata Basiura and Anna Czapkiewicz have focused their research on the identification and verification of the rank of the Polish market in the rankings of global financial markets prior to and following Poland's accession to the European Union. In the research, stock exchange indices were classified based on the correlation coefficient generated from the t-Student copula. The simulation experiment was performed concerning the effect of the political decision of Poland's accession to the EU on the ranking of the WIG index among nineteen stock exchange indices from all over the world; the experiment confirmed the empirical classification results.

Natalia Iwaszczuk *et al.* discuss a feasibility of selecting such parameters of lookback options which would mitigate the risk assumed by an investor.

Justyna Dyduch presents investment tasks executed by selected Polish power plants in the area of reducing air pollution, as well as the scale of the related public assistance.

The book concludes with two papers devoted to certain detailed aspects of IT supported enterprise management. Jerzy Duda *et al.* propose a new universal XML schema designed to support a complete product description, for a particular use in e-trade. Janusz Opiła *et al.* consider the problem of feasibility of network service personalisation with the simultaneous guarantee of customer anonymity and protection of customer personal data. The authors present a suggested possible solution to the problem with respect to the existing ICT technologies.

You are kindly invited to peruse these *Aspects of Production and Management Engineering*.

Piotr Łebkowski