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Editorial

OR and the management of electronic services EURO'2004 EJOR feature issue

One of the most important concerns of the European Union is the provision and continuous improvement of goods and services within the Europe of today and tomorrow. Among the technologies used for this purpose, the Internet has become a powerful vehicle of services rather than just a repository of information. Many organizations are struggling to put their core business competences on the Internet as a collection of e-services, while customers may retrieve these services from the web and fuse them into combinations of new value-adding e-services in different ways.

The 17 articles gathered in this feature issue originate in the 20th EURO Conference, held in Rhodes Islands in July 2004. The main theme of the conference – OR AND THE MANAGEMENT OF ELECTRONIC SERVICES – dealt with the contribution of operational research philosophies, methods and techniques to the design, performance and delivery of e-services. Finally selected papers target towards the academic and practical aspects of e-Commerce, e-Business and e-Government.

The present feature issue starts consequently with a corresponding review paper by G.I. Doukidis and K. Pramatari which aims at giving insight into the relation between operations research and the management of electronic services. The authors summarise the various aspects in which operations research may support the management of electronic services, taking into account the different characteristics of alternative electronic media, such as the Internet, mobile communications, interactive television, etc.

The following papers, more or less close to the overall theme, are organized along six principal topics: Management of electronic services, financial modelling and engineering, multiple criteria decision analysis, data mining and knowledge management, networks and electronic services, and mathematical programming.

1. Management of electronic services

Three papers directly relay to the main theme of the EURO 2004 conference.

C.D. Tarantilis, C.T. Kiranoudis, and N.D. Theodorakopoulos: *A web-based ERP system for business services and supply chain management. Application to real-world Process Scheduling*. The authors present a system developed for attacking business problems and managing real-world business processes ranging from simple office automation procedures to complicated supply chain planning.

M. Louta, I. Roussaki, and L. Pechlivanos: *An Intelligent Agent Negotiation Strategy in the Electronic Marketplace Environment*. In their paper, the authors present a dynamic multilateral negotiation model and construct an efficient negotiation strategy based on a ranking mechanism that does not require a complicated rationale on behalf of the buyer agents. The framework proposed considers both contract and decision issues, is based on real market conditions, and has been empirically evaluated.

E. Grigoroudis, Ch. Litos, V.A. Moustakis, Y. Politis, and L. Tsironis: *The assessment of user-perceived web quality: Application of a satisfaction benchmarking approach*. Here the authors present a pilot user satisfaction survey concerning the major cellular phone service providers in Greece. The

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analysis is based on a multiple criteria preference disaggregation approach for satisfaction benchmarking analysis.

2. Financial modelling and engineering

Ch. Tofallis: *Investment Volatility: A Critique of Standard Beta Estimation and a Simply Way Forward*. The author reviews the common interpretations that are applied to beta in finance and show that the standard method of estimation – least squares regression – is inconsistent with these interpretations. Consequently he presents an alternative beta estimator which is more appropriate, as well as being easier to understand and to calculate.

T. Shibata: *O.R. Applications: The Impacts of Uncertainties in a Real Options Model under Incomplete Information*. This paper examines the impact with respect to the uncertainty of the underlying state variable, profit uncertainty, on the real options model in a situation of incomplete information.

G.D. Samaras, N.F. Matsatsinis, and C. Zopounidis: *A Multicriteria DSS for Stock Evaluation Using Fundamental Analysis*. This paper describes a Multiple Criteria Decision Support System which aims at presenting an evaluation of the Athens Stock Exchange (ASE) stocks, on the basis of the fundamental analysis ratios method. The system, intended for both institutional and private investors, incorporates a large volume of relevant information and operates in real-world conditions.

3. Multicriteria decision analysis

E. Erkut, A. Karagiannidis, G. Perkoulidis, and St. A. Tjandra: *A Multicriteria Facility Location Model for Municipal Solid Waste Management in North Greece*. In this paper, the authors compare and contrast regional and prefectural Solid Waste Management (SWM) planning in Central Macedonia. Following this analysis, they present a new multiple criteria mixed-integer linear programming model to solve the location-allocation problem for municipal SWM at the regional level.

C.A. Bana e Costa, and J.-Cl. Vansnick: *A critical analysis of the eigenvalue method used to derive priorities in AHP*. A lot of research has been devoted to the critical analysis of the Analytic Hierarchy Process (AHP), from various perspectives. Here the authors address a fundamental problem concerning the meaning of the priority vector derived from the principal eigenvalue method used in AHP. The role of AHP's consistency ratio is also analysed.

4. Data mining and knowledge management

The first paper in this category is based on a semi-plenary presentation.

S. Olafsson, X. Li, and Sh. Wu: *Operations Research and Data Mining*. This paper provides a survey of the intersection between operations research and data mining. The primary goals of the paper are to illustrate the range of interactions between the two fields, present some detailed examples of important research work, and provide comprehensive references to other important work in the area.

G. Mavrommatis: *Learning Objects and Objectives towards Automatic Learning Construction*. The author presents a method that creates instructionally sound learning experiences by means of learning objects. The method distinguishes two kinds of learning objects properties and proceeds in two major steps: the course creation and the alternative learning sources selection.

5. Networks and electronic services

S. Yaiparoj, F. Harmantzis, and V. Gunasekran: *On the Economics of GPRS Networks with Wi-Fi integration*. Wi-Fi provides an appealing opportunity for GSM/GPRS operators to enhance their data capability. By integrating both networks, operators are able to provide 3G-like services. However, both networks have different data rates and capacity, which makes economics of the network integration and pricing of services a challenging issue. In this paper, the authors therefore introduce a novel pricing model for GPRS networks integrated with Wi-Fi networks.

Y.-M. Wang, C. Parkan, and T. Elhag: *Optimal aggregation of fuzzy preference relations with an application to broadband internet service selection*. This paper investigates the aggregation of multiple fuzzy preference relations into a collective fuzzy preference relation in fuzzy group decision analysis and proposes an optimization based aggregation approach to assess the relative importance weights of the multiple fuzzy preference relations.

N. Nikolic: *Statistical Integration of Erlang's Equations*. Establishing analytical description of a queuing system is in the form of a system of first-order differential equations. There are two commonly used methods of solving this system: analytical and

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numerical. Both are exact and reliable, but also very complicated. The author presents a third solution method that can be realized by mathematical statistics.

6. Mathematical programming

The first paper in this last category is based again on a semi-plenary presentation.

A. Caprara: *Constrained 0–1 Quadratic Programming : Basic Approaches and Extensions*. The author describes the simplest technique to tackle 0–1 Quadratic Programs with linear constraints among those that turn out to be successful in practice. The proposed technique is completely general and is by far the most successful one in several other cases, such as Quadratic Knapsack.

Z. Lukač, Kr. Šorić, and V. Vojvodić: *Production Planning Problem with Sequence Dependent Setups as a Bilevel Programming Problem*. The problem of processing n products on two machines may be formulated as a bilevel mixed 0–1 integer programming problem. The objective of the leader problem is to assign the products to the machines in order to minimize the total sequence dependent setup time, while the objective of the follower problem is to minimize the production, storage and setup cost of the machine.

Z. Laslo, B. Keren, and H. Ilani, *Minimizing Task Completion Time with the Execution Set Method*. The authors seek an arrangement of a network of assembling operations and an execution plan that divides the task operations among the conveyers by minimizing the overall task completion time. They use linear programming optimization, subject to reasonably general rules for distributing the operation-fragments among the conveyers.

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