JULY 11-14, 2010

EURO XXIV LISBON

24th European Conference on Operational Research

1 - Discrete location for bundled demand points

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We consider a discrete location problem where the demand points are grouped and propose a formulation, an enforcement for it and an associated agrangian relaxation, and then we build feasible solutions to the problem from the optimal solutions to the relaxed subproblems. Valid inequalities for the formulation are also identified and added to the set of relaxed constraints. This method produces good feasible solutions and enables us to address large instances of the problem. Computational experiments have been performed with benchmark instances from the literature on related problems.

2 - Lower Bounds for a Capacitated Facility Location Problem with Penalties and Revenues

Maria João Lopes, Departamento de Métodos Quantitativos, Lisbon University Institute(ISCTE - IUL); CIO, Av. das Forcas Armadas, 1649-026, Liboa, Portugal, mjfl@iscte.pt

We consider a variant of the Capacitated Facility Location Problem in which the demand of each costumer may not be entirely supplied. In this variant, the available supply is not enough to satisfy the total demand. A penalty is associated with each unit left out. On the other hand, each costumer can be supplied by more than one facility. Nevertheless, satisfying the demand of a costumer entirely by exactly one facility is aimed. If this condition is satisfied revenue is considered. We propose a formulation for this problem and valid inequalities to improve the lower bounds.

3 - Assessing the accuracy for estimation of Origin-Destination matrices in the railways system context

Eva Barrena, Applied Mathematics I, University of Sevilla, Avda. Reina Mercedes s/n, 41012, Sevilla, Spain, ebarrena@us.es, Mª *Teresa Cáceres, Francisco A. Ortega, Miguel Angel Pozo*

The estimation of a travel matrix Origin-Destination (O-D), updated with traffic counts from the transport network and from a previous O-D matrix, is a problem that is of interest for researchers, due to the challenge linked to the complexity involved, as well as for transport companies interested in knowing the behavior of their users via a more economical and efficient procedure than the ones based on surveys. The most representative estimation methods are based on entropy maximization, statistical inference models and optimization methods, whose effective resolution applies iterative algorithms, heuristics and metaheuristics.

The objectives of this paper consist in the evaluation of the prospects of this problem for a specific company such as RENFE-Cercanías Madrid, as well as the evaluation of possible methodologies to apply depending on their adequacy to the real context. This work has been partially supported by the the Andalusian Government project Ref. P09-TEP-5022 and by the Spanish research Project PT-2007-003-08CCPP (CEDEX).

4 - On a common structure of the discrete optimization with ordering

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This paper studies discrete optimization problems with ordering requirements. These problems are formulated on general discrete sets in which there exists an implicit ordering on their elements together with a cost function that evaluates each element of a given subset depending on its ordering relative to the remaining elements in the set. It is proven that ordered sequences over the original set define an independence system. The simplest and its restriction to sets of a fixed cardinality are studied. Ordering problems on the intersection of two independence systems are addressed.

■ MD-14

Monday, 14:00-15:20
2.2.15

Pricing Issues

Stream: Supply Chain Planning [c]
Contributed session

Chair: *Carla A. S. Geraldes*, Department of Industrial Management, Polytechnic Institute of Bragança, Campus de Santa Apolónia, Apartado 134, 5301-857, Bragança, Portugal, carlag@ipb.pt

1 - A New Multi-Objective Approach for Pricing and Distribution in a Supply Chain

D. Shishebori, Industrial Engineering, Iran University of Science and Technology, Narmak, 1684613114, Tehran, Tehran, Iran, Islamic Republic Of, shishebori@in.iut.ac.ir, *S.g.r. Jalali-Naini, M. Karimi-Nasab*

In this research a new multi-objective approach is proposed to determine distribution policy for a wholesaler of supplementary nutrition to a set of local distribution centers positioned around the wholesaler, geographically. Each o local distribution center has its own stochastic demand over planning periods. Also the demand of each local distribution center in a planning period is considered as a normal distribution function. There is a time series relation between the mean of demand of each local distribution center in a period and previous periods. The model illustrates the conflict of two objectives for the main partners of the problem: manager of the wholesaler aims at maximizing the total profit of the wholesaler, and local distribution centers desire to maximize the minimum service level received from the wholesaler. The approach optimizes selling price, carrying cost, batch size and services level of multi items for each local distribution center in every planning period. Some of the theorems are proven about different characteristics of the proposed model and a new solution method is proposed for obtaining a set of global Pareto-optimal solutions of the problem. The solution method is proven to be able to find all global Pareto-optimal solutions of the problem in certain conditions. Finally the computational experiences of running the proposed approach in a real case study are analyzed.

2 - Determination of pre-order and after-order prices for a capacitated supply system

Bisheng Du, Department of Business Studies, Aarhus School of Business, Aarhus University, Fuglesangs Alle 4, DK-8210 Aarhus V, 8210, Aarhus V, Aarhus, Denmark, bisd@asb.dk, *Christian Larsen*

In order to transfer some of the risk of having developed inadequate capacity to his buyers a supplier may be willing to offer his buyers to make pre-orders, issued before the capacity decision, in exchange for reduced prices compared to the prices the buyers pay after having observed their demand. By use of a news-vendor model we develop the optimization problem for the single buyer case and investigate the optimal prices. In addition, we also investigate the case of demand probability updating given the advance demand information.

3 - Competitive Price-Matching Guarantees under Demand Uncertainty and Customer Heterogeneity: Effects of Product Availability and Its Verification

Arcan Nalca, School of Business, Queen's University, Canada, arcan.nalca@business.queensu.ca, *Tamer Boyaci, Saibal Ray*

Price-matching-guarantees (PMGs) are offers where firms promise to match any lower price offered by competitors. Firms nowadays reserve the right to verify the availability of the product at competitors' and decline to match the price unless it is available. Focusing on these elements, we investigate the effects of demand uncertainty and verification of availability in the context of PMGs and show that verifying availability is a significant profit-enhancing mechanism for innovative products.

4 - Integrated approaches to warehouse planning and operations

Carla A. S. Geraldes, Department of Industrial Management, Polytechnic Institute of Bragança, Campus de Santa Apolónia, Apartado 134, 5301-857, Bragança, Portugal, carlag@ipb.pt, *Sameiro Carvalho, Guilherme Pereira*

In this talk we discuss a tactical model recently available in warehouse literature. The model integrates the replenishment decision in inventory management, the allocation of products to warehousing systems and the assignment of products to storage locations in warehousing management. Our aim is to show the models' potentialities and weaknesses when applied to a wide variety of problems and to identify challenging research opportunities for developing global warehouse decision support models that fill the gap between researchers and warehouse practitioners.