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26TH EUROPEAN CONFERENCE ON OPERATIONAL RESEARCH

MMXIIIROME

ABSTRACT BOOK

ROME 1-4 JULY, 2013

SAPIENZA
UNIVERSITÀ DI ROMA

2 - A Stochastic Programming Approach For Multi-Echelon Inventory Control Management
Bülent Çekiç, Business Administration, Hacettepe University, Turkey, bulentc@hacettepe.edu.tr

In this paper, the inventory problems with fixed ordering costs under stochastic and non-stationary demand were adapted to multi-echelon inventory systems and offering flexible stochastic programming approaches to this difficult inventory control problem. In this manner, two mathematical models were developed in order to obtain optimal cost under these assumptions of inventory control approaches. Also these models are compared in terms of cost values to be obtained as a result of these approaches under various demand and cost parameters using hypothetical inventory test problems.

3 - Multi-location inventory problems with lateral transshipments under stochastic demand
Olga Rusyaeva, Kuehne Logistics University, Germany, olga.rusyaeva@the-klu.org, *Joern Meissner*

The use of lateral transshipments is a widely known strategy to pool inventories between stocking locations of the same echelon. Most studies consider transshipments as an emergency tool to quickly response to stock outs. In contrast, we consider proactive transshipments that response to the risk of stock outs. Our model allows for transshipments during an order cycle. We analyze heuristics to find the transshipment policy that maximize overall expected profit. Numerical experiments show a competitive performance of the proposed algorithm against the state-of-the-art methods in the literature.

4 - Polynomial time algorithms for Cardinality Constrained Robust Lot Sizing models
Dolores Romero Morales, Said Business School, University of Oxford, Park End Street, OX1 1HP, Oxford, United Kingdom, dolores.romero-morales@sbs.ox.ac.uk, *Dong Li*

In this talk, we study robust versions of the well-known economic lot-sizing (ELS) model and the capacitated lot-sizing (CLS) model with time-invariant capacities. We use the absolute robust criterion with the so-called cardinality constrained uncertainty sets. For the ELS, we present a polynomial time algorithm when both the production cost function and the demand are uncertain, improving existing running times in the literature. For the CLS, we present a polynomial time algorithm when the production cost function is uncertain, and study the implications of uncertain demand for the CLS.

■ MD-33

Monday, 14:30-16:00
G8-3

Production and supply chain design

Stream: Production and the Link with Supply Chains
Invited session

Chair: *Farouk Yalaoui*, Institut Charles Delaunay, ICD LOSI, University of Technology of Troyes, 12, Rue Marie Curie BP 2060, 10000, Troyes, France, farouk.yalaoui@utt.fr
Chair: *De Souza Mauricio*, Departamento de Engenharia de Produção, Universidade Federal de Minas Gerais, Av. Presidente Antônio Carlos, 6627 , Belo Horizonte, Brazil, mauricio.souza@pq.cnpq.br

1 - Optimized supply chain design in the fast moving consumer goods industry
Marcus Brandenburg, Chair of Supply Chain Management, University of Kassel, Untere Königsstr. 71, D-34117, Kassel, Germany, brandenb@uni-kassel.de

We focus on a realistic case example of supply chain (SC) design for new product introduction (NPI) at a globally operating fast moving consumer goods manufacturer. Due to short product life cycles (PLC), the SC design decisions have to be made before the product is launched in the marketplace and must reflect the whole PLC. Different regional launch plans and pipeline filling requirements that decouple market demands from production capacity increase the problem complexity. A MILP formulation is chosen to optimize the SC design with regards to efficiency, effectiveness and net present value.

2 - An optimisation model for the warehouse design and product assignment and allocation problem
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*

Warehouse design and planning is a great challenge in the field of Supply Chain Management. In this paper we discuss an optimisation model aiming to support some warehouse management decisions. In particular a mixed-integer programming model (MILP) is presented to determine product assignment and allocation to the functional areas, as well as the size of each area. Our aim is to capture the trade-offs among the different warehouse costs in order to achieve global optimal design satisfying throughput requirements.

3 - Supplier selection under workload constraint and order allocation
Burak Efe, Industrial Engineering, Gazi University, Ankara, Ankara, 06930, Ankara, Turkey, Turkey, efecihangir@gmail.com, *Ömer Faruk Efe*, *Mustafa Kurt*

We study a fuzzy inference in case based reasoning (FICBR) for supplier selection under cost, quality, delivery constraints. We use fuzzy extended AHP method to determine weights of these three constraints. Overall similarity calculation between customer and supplier firms is determined with FICBR. Ten suppliers are considered on supplier selection. We select three suppliers that have the highest overall similarity rate. Order quantities are allocated to these three suppliers using multi objective linear programming under workload constraint. Efficiency of model is analyzed on a test problem.

4 - An approach for the detection of critical disturbances in integrated production and transport systems
Jens Hartmann, BIBA - Bremer Institut für Produktion und Logistik GmbH at the University of Bremen, Hochschulring 20, 28359, Bremen, Bremen, Germany, hmn@biba.uni-bremen.de, *Carlos Ernani Fries*, *Bernd Scholz-Reiter*

Manufacturing processes take place in networks of collaborating partners connected via transport operations. These integrated systems are subject to dynamic influences that might put a given schedule at risk, e.g. machine break-downs, traffic congestions or rush orders. Thus, it is important to detect disturbances at an early stage and to decide whether they are critical or not. This work presents a signal based fuzzy control method that can trigger a rescheduling to mitigate negative effects of critical disturbances. The methods capabilities are shown by means of a simulated test scenario.

■ MD-34

Monday, 14:30-16:00
G8-4

Demand Management: Demand fulfillment 1

Stream: Supply Chain Planning
Invited session

Chair: *Herbert Meyr*, Department of Supply Chain Management, University of Hohenheim, (580 C), 70593, Stuttgart, Germany, H.Meyr@uni-hohenheim.de

1 - Allocation Planning in Make-to-Stock (MTS) Environments with Stochastic Linear Programs (SLP)
Stephanie Eppler, Department of Supply Chain Management, Prof. Dr. Herbert Meyr, University of Hohenheim, 70593, Stuttgart, Germany, s.eppler@uni-hohenheim.de, *Herbert Meyr*

Uncertain demand of heterogeneous customer classes and scarce capacity in MTS environments implies transferring Revenue Management ideas to MTS settings. We present SLP models as an approach for multi-period, multi-class allocation planning models for MTS which account for demand uncertainty. We focus on interactions between the