I S I R

I S I R NEWSLETTER

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ISIR OFFICIALS

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EDITORIAL

Inventory research needs new directions. Having read the abstracts of the forthcoming Symposium I could not escape the idea that we know more and more about the details but have little synthesized, comprehensive knowledge on many issues related to inventories.

Inventory research has developed tremendously in the last few decades. We can answer now questions which we could not even ask a generation ago. Also, a large part of the knowledge has found its way to practical life, in the economy and in management.

Nevertheless, there is a shortage of efforts to answer the most fundamental questions about inventories. Most certainly, we could hardly agree even on the main motivation elements on holding inventories.

ISIR is a very special organization. It has among its members most of the greatest experts on inventories. Let us think about the basics a little – and perhaps our society can stand behind some more research efforts regarding the real essentials of the inventory problem. The Symposium will be a great occasion to talk about that.

Attila Chikán

14TH INTERNATIONAL SYMPOSIUM ON INVENTORIES

August 21-25, 2006, Budapest, Hungary

Program

The professional program starts on **August 21, 2006** with plenary sessions to be addressed by internationally acknowledged scholars. On the following days there will be parallel sessions grouped under the following topics:

I. **Economics of Inventories**
II. **Inventory Management**
III. **Mathematical Models of Inventories**
IV. **Forecasting Inventories**

Besides the regular paper presentations there will be four workshop sessions on Tuesday afternoon:

- Some Suggestions for Improving Research Productivity
- Education Hubs on the Horizon
- Bullwhip Effect: Concept, Implications and Responses – A Tutorial
- International Logistics Management Game – Edutainment in the Hungarian Hihgher Education

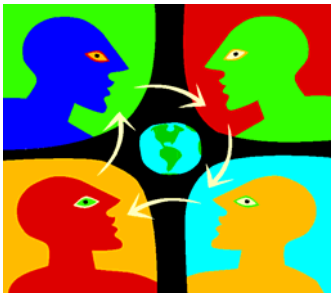
The preliminary program schedule is available on the ISIR website.

All sessions will be held in ***Sofitel Atrium Budapest Hotel.***

ISIR Official Meetings

The **ISIR Executive Committee** will have its meeting on Monday, August 21 evening.
The **ISIR General Assembly** meeting will be held on Thursday, August 24 in the afternoon.

FUTURE EVENT



NEXT ISIR Session at the Allied Social Science Associations Meetings

January 5-7, 2007, Chicago, IL, USA

Session Title: Recent Advances in Inventory Research

Chair: George Hall, Brandeis University

Howard Marvel and James Peck, The Ohio State University: *Inventory Turnover and Product Variety*
Discussant: Adam Copeland, Bureau of Economic Analysis

David Bivin, IUPUI*: Inventories and Interest Rates*
Discussant: Huntley Schaller, Carleton University

Yongseung Jung, Kyunghee University, and **Tack Yun**, Board of Governors of the Federal Reserve System:
Monetary Policy Shocks, Inventory Dynamics, and Price-setting Behavior
Discussant: Yongsung Chang, Seoul National University

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REPORT ON INCOM2006

Special track on Production Planning and Inventory Control
May 17-19, 2006, Saint Etienne, France

http://www.emse.fr/incom06

Control of manufacturing systems is often decomposed by time-scales. By naturally integrating production and demand over some time horizon, inventories reflect the mid-time evolution of manufacturing systems, and inventory control appears as a major mechanism for their tactical management.

A key problem for production networks is how to control fluctuations of stock levels due to the distributed nature of inventory control policies, possibly with different lot sizes, base stock levels, review times.

Other dynamical effects on inventories may reflect demand and supply randomness. Inventories have fixed and variable costs but they also provide the system with rapidity and robustness. Through the diversity of assumptions and models used to represent reality and objectives, inventory control is deeply rooted both in theory and practice.

Inventory control thus appears as a key topic in this conference and the special track includes contributions in inventory control models, policies, theory and practice.

Track chairs

Yannick Frein, INP Grenoble, Laboratoire GILCO, Grenoble, France, yannick.frein@gilco.inpg.fr
Jean-Claude Hennet, CNRS, LISA-Université d'Angers, France, hennet@laas.fr.

Session [THU-2]
Production Planning Under Uncertainties

A Sub-Optimal Control Policy Applied To Production Planning Problem Under Exogenous Fluctuation Of Demand

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An aggregated production planning problem is formulated as a sequential stochastic optimal control problem with constraints. In order to deal with this kind of problem, an equivalent deterministic problem, which keeps the first and second statistic moments directly in the formulation, is considered. Unfortunately, mathematical programming techniques applied to this deterministic problem provide only frozen policies (i.e. open-loop). To overcome such a difficulty, a suboptimal approach, called Naive Feedback Controller (NFC), is introduced. It provides a revised sequential solution for the equivalent deterministic problem. A simple example, where the inventory system is subject to demand's variability, illustrates the performance of NFC policy in comparison with an open-loop policy.

Decision Support For Supply Chain Planning Under Uncertainty

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On the purpose of assisting the decision making, this paper investigates the planning process of a production unit with the aim to satisfy the customer final demand while respecting its internal constraints and those of its supply chain partners. In that purpose, we develop a mixed-integer linear programming model embedding the modelling of the necessary anticipation of a decision and the possibility to simulate, evaluate and compare several strategies of integration of forecasts in the planning process. Finally, a numerical example highlighting the interest of our approach is given.

A Model For An Assembly System Under Lead Time Uncertainty

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This paper studies a customized product assembly scenario where some of its components cannot be stocked due to high component cost and risk. We

consider the scenario where these key components are ordered after a demand has been registered with a promised delivery date. Components lead times are stochastic and associated distribution function is known in advance. The objective is to find the ordering time of each component such as to minimize the expected holding and backlogging costs. A solution approach is proposed and algorithm is tested on randomly generated data set.

Evaluating the Impact of Misplacement Errors on Decentralized Retail Supply Chain

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This paper studies a supply chain in which a manufacturer sells a single product to a retailer who faces a Newsvendor problem subject to inventory inaccuracies. Due to execution problems, all products received from the manufacturer are not available on shelf for sales either because they are lost in the backroom or misplaced in the store. We consider three scenarii: in the Centralized Scenario, we consider a single decision-maker who is concerned with maximizing the entire chain's profit. In the Decentralized Uncoordinated Scenario, the retailer and manufacturer act as different parties and do not cooperate. The third scenario is the Decentralized Coordinated Scenario where we give conditions for coordinating the channel under a buyback contract. We analyze the impact of misplacement errors, in terms of additional underage and overage costs, on the store performance and we investigate the effect of coordination as a lever to increase manufacturer and retailer's profits.

Session [FRI-1]
Advances In Inventory Policies

An Analysis of Forecast Based Reorder Point Policies: The Benefit of Using Forecasts

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In this paper, we analyze forecast based inventory control policies for a non-stationary demand. We assume that forecasts and the associated uncertainties are given at the beginning of the horizon of forecasts. Two forecast based reorder point policies are proposed: the (rk;Q) and the (rk;Qk) policies. These dynamic policies represent an extension of the classical discrete time (r;Q) policy. The parameters of these policies are determined by using a sequential approach which satisfies a cycle service level. A numerical comparative study of these policies is developed enabling us to show the benefit of using them when forecasts are reliable.

A Discrete EOQ Problem with Maximum Order Size Costs

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The Economic Order Quantity (EOQ) problem is a fundamental problem in supply and inventory management. An optimal solution to this problem in a closed form exists under the assumption that time and the product are continuously divisible. This paper studies problem D-EOQ, in which time and the product are discrete. Furthermore, in the objective function, there is a fixed cost for each order and a fixed cost for each product unit in an order of the maximum size. It is shown that the continuous relaxation of problem D-EOQ provides a solution that can be up to 50% worse than the optimal solution and this worst-case error bound is tight. Properties of an optimal solution of the problem D-EOQ are established. These properties allow to solve many special cases in polynomial time and can be used to derive a polynomial time algorithm for the general case of the problem D-EOQ.

Evolution of Kanban Systems Thanks to a Max-plus Algebra Analysis

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This paper deals with a possible evolution of a Kanban system due to a (max,+)-algebra analysis. We show that for a given Kanban system, it is always possible to change the original Kanban policy by a

(max,+)-linear policy which keeps the same quality of service but reduces the work in process. This new control policy contains a (max,+)-linear dynamic behavior for the recycling of kanban cards.

Efficient Heuristics to Design Semi Finished Products Stock

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Looking for ways to stay competitive in the global marketplace, the firms attempt to provide a wide variety of products, this satisfying the need of customers. However, simply increasing variety does not guarantee an increase in long run profits. Furthermore, providing quick and reliable customer's order delivery has been an important parameter of competitiveness. Consequently, many manufacturing systems adopted an Assemble-to-order policy, in such policy only components or semi-finished products inventories are kept. The objective of this paper is to propose an approach to define the most relevant semi-finished products to be stored taking into account the inventory cost and the final assembly time.

Session [FRI-2] - Information Sharing And Coordination

Supply Chain Modelling and Control Under Proportional Inventory-Replenishment Policies

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A novel state-space model of a multi-node supply chain is presented, controlled via local proportional inventory-replenishment policies. The model is driven by a stochastic sequence representing customer demand. The model is analyzed under stationarity conditions and a simple recursive scheme is developed for updating the covariance matrix. This allows us to characterize the \bullwhip effect" (demand amplification) in the chain and to solve an optimization problem for a three-node model involving the minimization of inventory subject to a probabilistic constraint on downstream demand. Finally, issues related to estimation schemes based on local historical data are discussed.

Inventory Control in A Decentralized Two-Stage Make-To-Stock Queuing System

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In an Enterprise network, several companies interact to produce families of goods. Each member company seeks to optimize his own production and inventory policy to maximize his profit. These objectives are generally antagonistic and can lead to contradictory choices in the context of a network with a high degree of local decisional autonomy. To avoid a global loss of economic efficiency, the network should be equipped with a coordination mechanism. The present paper describes a coordination contract negotiated between a manufacturer and a supplier. The purpose of the negotiation is to determine the price of the supplied intermediate goods and the delay penalty in case of a late delivery. For a manufacturer with a dominant contracting position, the outcome of the negotiation can be computed as a Stackelberg equilibrium point. Under the resulting contract, the two-stage supply chain reaches globally optimal running conditions with the maximal possible profit obtained by the manufacturer and the smallest acceptable profit obtained by the supplier.

A Framework To Elaborate A Strategy Of Information Sharing And Cooperation In A Depot Problem

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In this paper we present a framework for examining the effects of information sharing and system cooperation in a distribution system, with random ordering leadtime. The system consists of a depot and several retailers. The depot is not allowed to hold any inventory. Regarding the two major decisions in a depot problem, we claim that different patterns of information sharing can be considered in replenishment decisions and different modes of cooperation can be considered in allocation decisions. We proposed to model the leadtime uncertainty as a finite-state Markov Chain.

Analysis of RHF Contracts Under Highly Variable Externalised Demand

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A discrete-event simulation model of a supply chain has been developed to evaluate operational performance of sharing uncertain information on upcoming demand between an Original Equipment Manufacturer (OEM) and a Contract Manufacturer (CM) under a formal Rolling Horizon Flexibility (RHF) contract in a four node supply chain. There are two types of RHF contracts evaluated, that is, RHF contract with constant flexibility and decreasing flexibility bounds. The demand is externalised (that is, the OEM receives the demand), stochastic and is generated according to the gamma distribution. This paper reports on analysis of RHF contracts operating with coefficients of variation (CV) of demand up to 2.00. Analysis of the interaction of RHF contacts with OEM forecasting and the impact a RHF contract has on the transmission of the bullwhip effect are reported here.

REPORT ON THE 9TH INTERNATIONAL EUROMA CONFERENCE

Special track on Production Planning and Inventory Control

June 19-22, 2006, Glasgow, UK

http://www.euroma2006.com

The 13th international conference of European Operations Management Association was organized jointly by the University of Strathclyde and the University of Glasgow. The theme of the conference was "**Moving up the value chain**" referring to the tendency that firms nowadays strive for higher value added in all the manufacturing, services and public sectors.

The Scottish weather did not give the lie to itself, it was raining almost whole day. But organizers kept their promise; weather was the only thing which was not under their control. Thus the 350 participants had perfect circumstances to direct their attention to the almost 250 presentations in 15 parallel sessions.

Just to give a general feeling of the conference, here is the list of sessions with the number of presentations in brackets:

- Global operations and strategy management (9)
- Supply and value chain management (49)
- Logistics and physical distribution (10)
- Operations planning, scheduling and control (13)
- Managing supply and procurement (16)
- Collaborations (14)
- Business process outsourcing (10)
- Operations management (50)
- Innovation and product development (16)
- Sustainability (12)
- Service operations (22)
- Performance management (22)

Screening through the papers the interest towards supply chain management and its components (logistics, procurement, outsourcing) have not decreased. Some topics, however, have been strengthened including the issue of collaboration, which concentrate on the non-technical aspects of partnerships, or sustainability, an issue, which I believe, will be in the focus in the coming years. And finally, although not in a special session, but values, capabilities and competences were also popular topics among researchers.

There were three keynote speakers during the conference. In the opening session *Kees van der Heiden* spoke about the link between strategy management and operations management. Shortly, he discussed how companies can achieve fit between their distinctive competences and customer values through a reinforcing loop. In the afternoon *Professor Iver Tiefenbrun*, CEO of Linn Products has shown the connection between real time manufacturing and single-stage build. *Per Magnus Karlsson* from ORACLE, the Head of SCM and manufacturing industries Europe Middle East and Africa in the closing presentation of the conference described how to build global supply chain excellence using information systems.

There were some special sessions and one is worth mentioning. *Harm-Jan Steenhuis* and *Stefan Seuring* organized a session on performance management in universities, a hot and familiar topic for all the participants nowadays.

In the traditional Chris Voss Best Paper Award, which is given to the best paper in the Proceedings of the conference, the results were as follows: *Julio Sanchez Loppacher, Raffaella Cagliano, R. and Gianluca Spina* won the prize with the paper "**Key drivers of buyer-supplier relationships in global supply strategy**". The runner-up paper was written by *Alison Bettley, David Mayle and Tarek Tantoush* with the title "**Operations management re-examined: moving the operations manager up the value chain**".

Going through the papers in the Proceedings I discovered the following, closely inventory related papers:

- Alvarez, A., Garcia Higuera, A., de la Fuente Ruz, M. And Abril Duro, J.: *RFID enhanced multi agent system for stock control at group Lo Monaco*
- Boute, R., Lambrecht, M., Lambrechts, O, Sterckx, P.: *An analysis of the variation in inventory performance in the Belgian manufacturing industry ans the financial impact of inventories*
- Dreyer, H., Stranhagen, O., Kollberg, M. and Romsdal, A.: *An operations model for automated replenishment in the pharmacy industry*
- Sampaio, M. and Pereira, S.: *Stockout: revention vs recovery*
- Xie, Y.: *Fuzzy logic based decision making system for warehouse-retailer distribution network design*

There are five special issues planned from the best papers of the conference, so they will be available in journals. I guess the electronic version of conference papers might be ordered from the organizers.

And finally, to say something about the future, the **14th EurOMA conference** will take place in **Ankara, Turkey, at Bilkent University** with the theme "**Managing operations in an expanding Europe**" on **June 17-20, 2007**. The website has been set up already: www.euroma2007.org. Please do not forget to record it in your diary.

Krisztina Demeter

GMRG 2006 MEETING

Shanghai, China ❖ June, 2006

A cycle is closed… The Global Manufacturing Research Group had its first meeting in Shanghai over fifteen years ago. Times are changing: the area where today the globally famous Pudong district exists, with its skyscrapers and 430 kilometers/hour Airport Express, well, this area was a really run-down industrial district. China has changed a lot, we all know.

And GMRG is changing also: even if these changes are not as spectacular as the areas in Pudong. At the first meeting in 1990 hardly more than a dozen people gathered with great enthusiasm but only vague ideas about how this global research project should be conducted. Now the active participants of GMRG are well over 50, with many occasional co-operations and we have an unparallel data set on manufacturing practices literally from all parts of the world.

This year's meeting had a special character. It was organized jointly with the POMS International Conference of the Production and Operations Management Society at the campus of the China European Business School. Linda Sprague had taken a lion's part of the organization work. The GMRG paper presentations were scheduled for the last days of the POMS conference and than the GMRG members had their own working session discussing organizational and further research matters.

Attila Chikán

INFORMS INTERNATIONAL MEETING

June 25-28, 2006, Hong Kong

http://www2.informs.org/Conf/Hongkong06/

More than 1000 academics and practitioners from around the world attended the international conference organised by the Hong Kong Operational Society and the Operations Reserach Society of China. The conference featured 15 technical sessions along with plenaries.

There were plenty of inventory related papers presented. If you are interested, visit the above website and on the „Program" menu you can search the program for papers. If you write „inventory" in the keywords box, there will will 76 shots.

NEWS FROM MEMBERS

Open position: Assistant or Associate Professor in Logistics/SCM
Aarhus School of Business, Denmark

For further information please visit:
http://www.asb.dk/about/available/assistantprofessorlogistics.aspx

Alan Stenger, Penn State University, has recently taken a leave to serve as Ports of Auckland Visiting Professor of Logistics and Supply Chain Management at the University of Auckland, Auckland, New Zealand.

Professor Edward A. Silver is pleased to announce that **Dr. Hussein Naseraldin**, who has recently completed his doctoral studies at the Technion in Israel, will be joining him in the Haskayne School of Business, University of Calgary, as a postdoctoral assistant as of July 1, 2006."

CONFERENCE ANNOUNCEMENTS

2nd European Conference on Management of Technology / EuroMOT 2006
September 10-12, 2006, Birmingham, UK

The conference is being organised and hosted by Aston Business School on behalf of the International Association for Management of Technology (IAMOT). The conference theme is "**Technology and Global Integration**" and will focus on European and international technology management issues.
Conference contact at Aston Business School:

Pat Clark
Aston Academy for Research into Management
E-mail: p.a.clark@aston.ac.uk
www.iamot.org

4th International Logistics&d Supply Chain Congress
November 29-December 1, 2006, Izmir, Turkey

The 4th International Logistics and Supply Chain Congress 2006 will be organized by the cooperation of Izmir University of Economics, University of Miskolc, Belgrade University and LODER. Title of the congress is "*The Era of Collaboration Through Supply Chain Networks"* and it will be held in Izmir in November 29-30, and December 1, 2006.

Details can be found on the **Conference Web-site: http://dlm.ieu.edu.tr/logistics**

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12th MSOM Conference & Annual INFORMS Meeting
June 18-19, 2007, Beijing, China

The 12th MSOM conference, the annual meeting of the INFORMS Society on Manufacturing and Service Operations Management, will be held at theTsinghua University Campus in Beijing. The MSOM Conference is open to all researchers and practitioners with an interest in the management of manufacturing and service operations. It will be preceded by the Multi-Echelon Inventory Conference, a one-day conference bringing together practitioners and researchers interested in multi and single-stage production-inventory operations, supply chain management, and logistics. The Multi-Echelon Inventory Conference 2007 will take place on Sunday, June 17, 2007 at the same location.

Conference topics include but not limited to:

- Supply chain management
- Management of service operations
- Production planning & scheduling
- Manufacturing strategy & flexibility
- Field studies in operations
- Process & quality improvement
- Purchasing & auctions
- Outsourcing
- Inventory models
- Coordination issues
- International operations

Important Dates:

- Submission deadline: **February 1**
- Early registration begins: **April 1**
- Early registration closes: **May 1**
- Last day of the registration: **June 1**
- Multi-echelon Inventory Conference: **June 17**

***Contact:* Conference Co-Chairs:**

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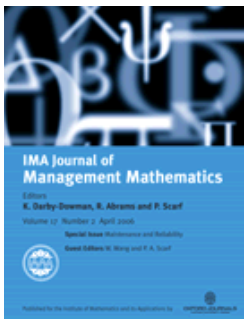

IMA Journal of Management Mathematics

Special Issue on Demand Forecasting for Inventory Management

Special issue editors
John E. Boylan, Buckinghamshire Chilterns University College
Aris A. Syntetos, University of Salford

Brief description of the topic

Many inventory systems cater for uncertain demand. The inventory parameters in these systems require estimates of the demand and forecast error distributions. The two stages of these systems, forecasting and stock control, are often examined independently. Most studies tend to look at demand forecasting as if this were an end in itself, or at stock control models as if there were no preceding stages of computation. Nevertheless, it is important to understand the interaction between demand forecasting and inventory control since this influences the performance of the inventory system.

Papers are invited for a special issue on "Demand Forecasting for Inventory Management" of the *IMA Journal of Management Mathematics*. Theoretical and/or empirical contributions that consider the interface between demand forecasting and inventory management and make a significant contribution to the field will be considered for publication. Potential topics include, but are not limited to:

- **Accuracy and performance measures**
- **Bullwhip effect**
- **Case studies**
- **Demand categorisation**
- **Distributional assumptions**
- **Hierarchical forecasting**
- **Multi echelon systems**
- **Serial systems**
- **Service level in the supply chain**

Deadlines and submission instructions

Manuscripts should be prepared in accordance with the "Instructions to Authors" presented in the Journal's web site (http://imaman.oxfordjournals.org/). Submissions should be e-mailed to both of the two Special Issue Editors. The PDF format is preferred, although the MS Word version is acceptable. The abstract of the paper should also be submitted separately in MS Word format. All papers will be refereed according to the standards of the *IMA Journal of Management Mathematics*. All submissions should be received by the Special Issue Editors by **January 12, 2007**.

Publication schedule

Manuscript submission: **January 12, 2007**
Reviewers' reports: **March 30, 2007**
Revised paper submission: **June 29, 2007**
Final manuscript submission to publisher: **December 21, 2007**
Publication: **April 2008 (vol. 19, number 2)**

Special issue editor

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