PARTNERING FOR GLOBAL TECHNOLOGY MANAGEMENT

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1) Roundtable Extensions of Pseudo-Boolean Functions, Endre Boros, Rutgers University, RUTCOR, 640 Bartholomew Rd., Piscataway, NJ 08854, boros@rutcor.rutgers.edu, Isabella Lari, Bruno Simeone, Giovanni Storchi

Some combinatorial optimization problems can also be modeled as the minimization of a pseudo-Boolean function over the binary n-vectors. Such a function can be still be extended over the entire cube $U = [0,1]^n$ in several ways. "Roundable" functions form a special family of extensions, which and approximation techniques particularly well.

2) Some Basic Concepts of Pseudo-Boolean Function Theory, Stephan Foldes, Rutgers University, RUTCOR, 640 Bartholomew Rd., Piscataway, NJ 08854, Peter L. Hammer

Some basic concepts of the theory of Boolean functions can be extended to pseudo-Boolean functions, i.e., to real-valued functions on binary variables. We discuss the concepts of implicans, implicates, prime implicates, prime implicatants, disjunctive normal forms, and conjunctive normal forms, and we discuss algorithmic procedures of the consensus/resolution type for the pseudo-Boolean case.

3) Equivalent Representations of a Set Function with Applications to Game Theory & Multicriteria Decision Making, Jean-Louis Verlet, Université de Liege, Dept. of Mgmt., FEGSS, Blvd. du Rectorat 7-B31, Liege, B-4000, Belgium, jl.marichal@ulg.ac.be, Michel Grabisch, Marc Roubens

We introduce 4 alternative representations of a set function: the Mobius transformation, the co-Mobius transformation, and interactions between elements of any subset of a given set as extensions of Shapley & Banzhaf values. The links between the 5 equivalent representations of a set function are emphasized through the use of the multilinear extension of pseudo-Boolean functions.

SC11 Rethinking Conventional Models in New Product Development

Sponsor: Technology Management

Chair: Durward K. Sobek, II, Montana State University, Dept. of MIE, Bozeman, MT 59717-3800, dsobek@ie.montana.edu

1) Business Cycles/Downsizing Engineering Staffs: Example of Stochastic Staffing Problem with Learning Effects & Non-Stationary Requirements, Edward Anderson, University of Texas, Dept. of Mgmt., CBA 4.202, Austin, TX 78712, edanderson@mail.utexas.edu

Managing a firm's knowledge resources under business cycles is vital but not well understood. Using the example of managing automotive engineers (who typically require years of mentoring) under business cycles, we develop an optimal dynamic programming policy for managing knowledge resources with long lead times under uncertain, non-stationary requirements.

2) withdrawn - author request 9/1, Marco Ianziti, Harvard Business School, Morgan Hall T69, Soldiers Field Park, Boston, MA 02163, mianziti@hbs.edu, Alan MacCormack, Jonathan West

3) Effective Transnational Concurrent Product Development Practices, Paul D. Collins, University of Washington, 20011 26th Ave. SE, Bothell, WA 98021-4900, collins@u.washington.edu, Frank M. Hull

Little is known about how to effectively implement concurrent practices in transnational product development teams. Based on findings from a recent field research project on concurrent engineering in France, Germany and the US, we show which practices work best in different kinds of transnational product development teams.

4) An Investigation into Best Practice Usage of Quality Function Deployment in the US & Japan, John J. Cristiano, 1072 Greenhills Dr., Ann Arbor, MI 48105, jcrriest@engin.umich.edu, Jeffrey K. Liker

We report on the results of a large-scale survey of companies using QFD, both in the US and Japan. Hypotheses of perceived cross-cultural differences in terms of internal motivation, management support, methodology employed, and the resulting impact on products and processes are explored.

SC12 Technology Management: A Brazilian Perspective

Sponsor: Technology Management/Management of Productivity & Technology

Chair: Sergio Takahashi, Universidade de Sao Paulo, Fac. de Economia Admin., Campus de Ribeirao Preto, Sao Paulo, 14040-900, Brazil, seutakah@davinci.feap.usp.br

1) Integrated Analysis of the Product Development Process: A Perspective of Innovation, Sergio Takahashi, Universidade de Sao Paulo, Fac. de Economia Admin., Campus de Ribeirao Preto, Sao Paulo, 14040-900, Brazil, seutakah@davinci.feap.usp.br

We begin with a review of the product development process literature with attention given to 3 components of the process: competencies, process integration and organization. Case studies of innovations in 3 global automotive enterprises are analyzed. We conclude with a discussion of a product development innovation model.

2) Manufacturing Strategies & Advanced Manufacturing Technologies: An Integrated Application in the Product Development Process, Vania Passarini Takahashi, Universidade de Sao Paulo, Fac. de Economia Admin., Campus de Ribeirao Preto, Sao Paulo, 14040-900, Brazil

The relationship between manufacturing strategies and AMTs in the product development process is presented. The relationship is examined in global manufacturing enterprises and the result is a strategic decision model to aid adoption of new manufacturing technologies.

3) Management Adoption of New Information Technologies in a Firm, Fernando C. de Almeida, Universidade de Sao Paulo, R Hibemere 1953, Sao Paulo, 01258-020, Brazil, falmeida@usp.br

In the dynamic environment of IT, many development opportunities may emerge. How to decide whether to invest in a new technology becomes a key issue. The research here will explore variables that may be important in the management of IT in a firm.

4) Globalization & Information Technology's Impact in the Brazilian Supermarket Sector, Flavia Angeliz Ghisi, Universidade de Sao Paulo, Fac. de Economia Admin., Contabeis Av Bandeirantes 3900, Ribeirao Preto, 14040-900, Brazil, ghisi@davinci.feap.usp.br

Globalization is creating competitive disadvantages for countries with emerging industries and technological capabilities. This study analyzes the Brazilian food products industry and applies a statistical methodology to evaluate the competitiveness of the industry.

SC13 Knowledge & Organizations

Sponsor: Organization Science

Chair: To be announced

1) College on Organization Science Subconference: Knowledge & Organizations

SC14 Vehicle Routing

Contributed Session

Chair: Vania Campos, Military Institute of Engineering, Praça Gen Tiburcio, 80-DE/2-Urca, Rio de Janeiro, 22290-270, Brazil, d2vania@epq.ime.br

1) Routing of Railway Carriages, Peter J. S. Brucker, University of Osnabrueck, Albrechtstr.28, Osnabrueck, D-49069, Germany, peter@mathematik.uni-osnabrueck.de, Johann Hurink, Thomas Rolfes

A passenger train is composed of different types of carriages. To route the carriages of a set of regular trains, an integer multi-commodity flow problem with fixed cost objective function is formulated. We apply SA with restarts to solve this problem. Computational results are reported.

2) A Heuristic Dynamic Programming Approach for the Vehicle Routing Problem with Stochastic Demands, Nicola Secondani, University of Florence, DISC Room 260A, Coll. of Bus., 5000 Calhoun St., Houston, TX 77204-6282, nick@bus.cba.uh.edu

A version of the vehicle routing problem where customers' demands are uncertain is considered. A state space decomposition and a heuristic dynamic programming algorithm that exploits this structure are proposed.

3) An Algorithm for Detecting K-Optimal Independent Paths, Vania Campos, Military Institute of Engineering, Praça Gen Tiburcio, 80-DE/2-Urca, Rio de Janeiro, 22290-270, Brazil, d2vania@epq.ime.br