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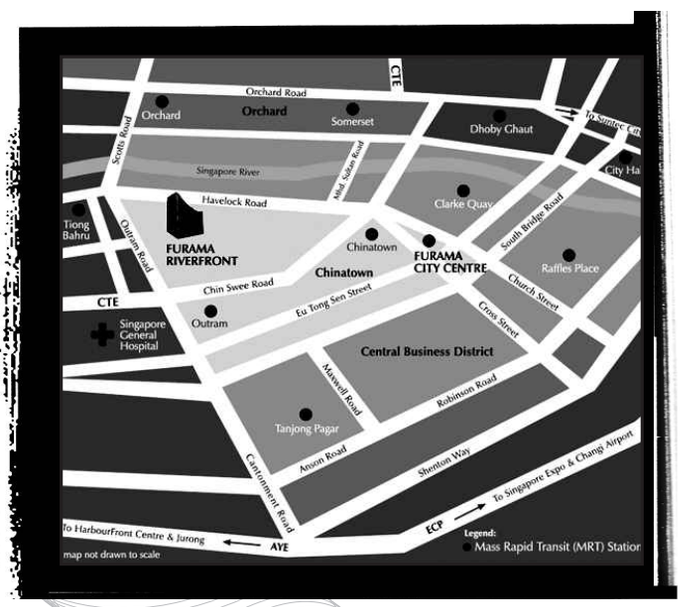
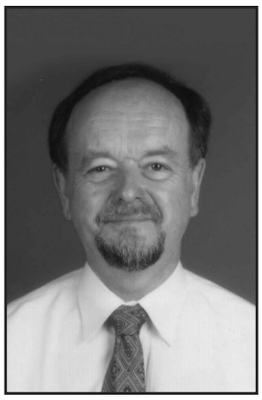


Conference Venue
Furama RIVERFRONT, Singapore
405 Havelock Road
Singapore 169633
Main Tel: (65) 6333 8898
Main Fax: (65) 6733 1588
Email: riverfront@furama.com
Website: www.furama.com

Welcome Message

by Conference Chairs



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Nanyang Technological University, Singapore

Min Xie,
Organizing Committee Chair,
Department of Industrial and Systems Engineering,
National University of Singapore, Singapore

Roger Jiao,
Program Committee Chair,
School of Mechanical Engineering,
Georgia Institute of Technology, USA

On behalf of the organizing committee of IEEM2008, we are pleased to welcome you to join us at the 2008 IEEE International Conference on Industrial Engineering and Engineering Management.

This year, being a year of Olympic Game, our subtitle is "Olympic spirit continues". The IEEM2008 organizing committee has put in an enormous effort with the aim at reaching a greater height with conference of even higher quality this year. Industrial Engineering and Engineering Management today find the application in many sectors and cover both theory and practice in different fields. This is reflected in this year's conference program as papers on various topics using IEEM tools and techniques are presented.

By the submission deadline we received over 900 full paper submissions which exceeded the number last year by a great margin. As for IEEM2007, each paper was sent to 3-4 referees including two program committee members and one or two volunteer/author referees. Thanks to the hard work of our referees, all authors were notified of the outcome ahead of the schedule. This year we were again very selective and accepted only 60%. Many good papers were not accepted. The authors can perhaps improve their paper based on the comments of the referees, and submit to our next IEEM conference.

We thank all authors for your interest and contribution. We are also very grateful for the help of the members of the organizing committee, the program committee and the advisory committee. The support from National University of Singapore and Nanyang Technological University is also greatly appreciated. Together we can help the IEEM conference to grow and contribute more to the society.

We wish all conference attendees a fruitful meeting with colleagues and friends. To those overseas, we hope that you enjoy your stay in Singapore and come back for another IEEM in future.

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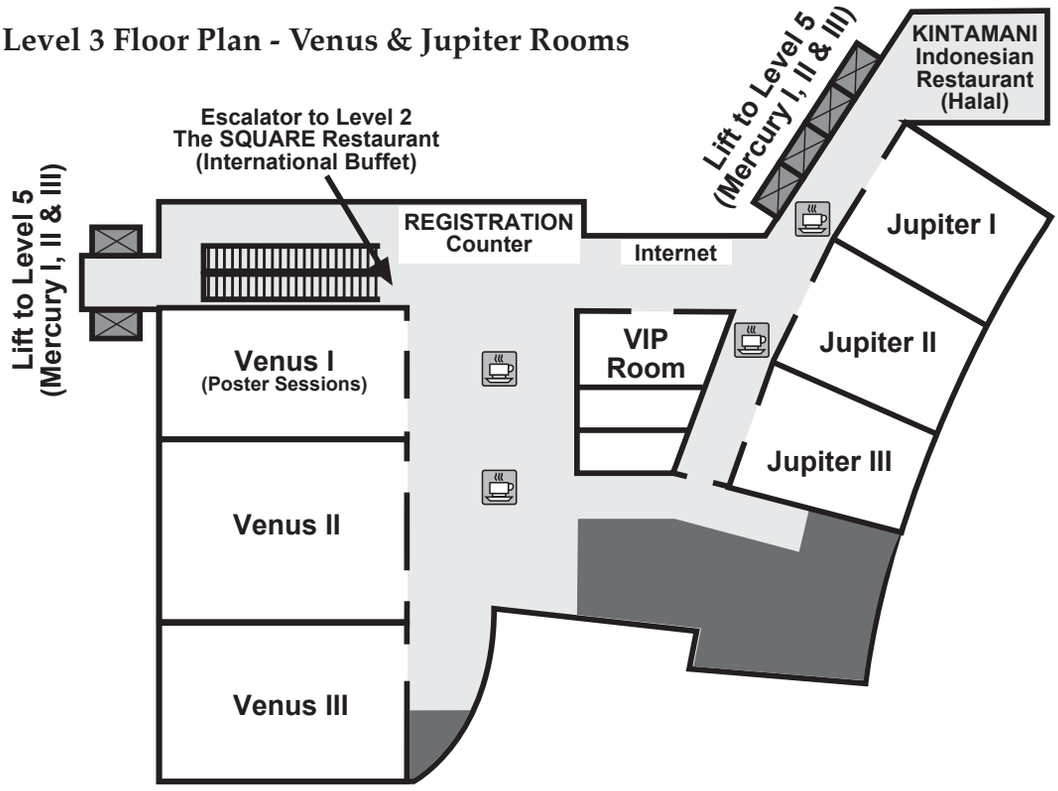
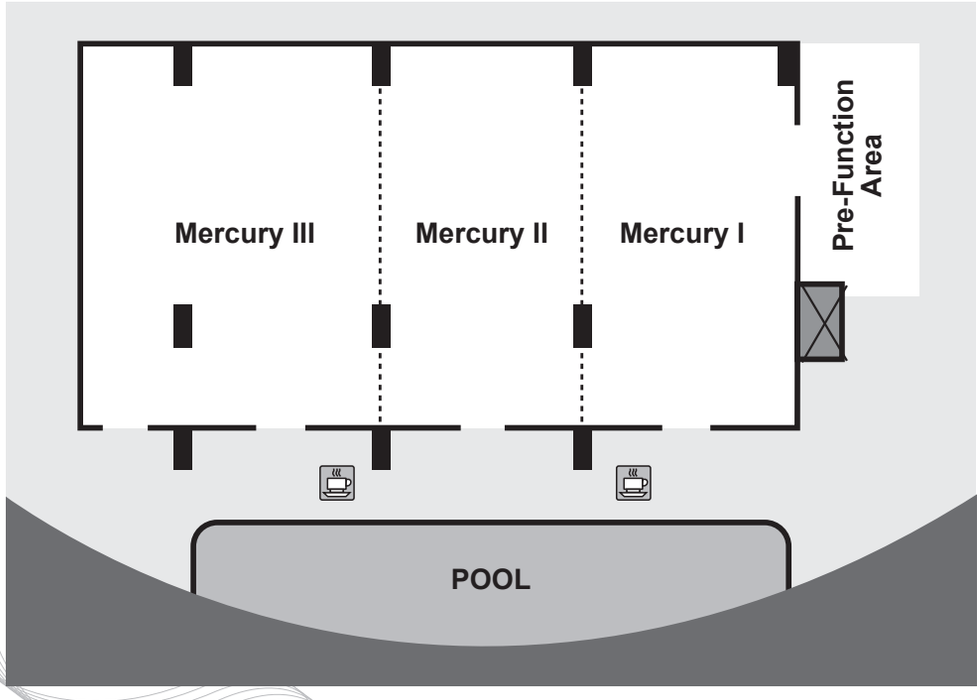
Meeting Rooms

Level 3 Floor Plan - Venus & Jupiter Rooms



Level 5 Floor Plan - Mercury Rooms



Program Overview

8 Dec – Mon: Delegate Arrival, Registration, Welcome Reception & Optional Tours

5.00pm	Registration Desk Opens	Level 5 Mercury Room
5.00 to 7.00pm	Registration & Welcome Reception	Level 5 Mercury Room

Optional Tours (Requires Advanced Booking)

- City Tour & Newton Food Centre — Coach Departs Hotel 6pm and Ends at Newton Food Centre

9 Dec – Tue to 11 Dec – Thu: Poster Sessions, Daily AM/PM Coffee/Tea

10.30 to 11.00 – AM Break	3.00 to 3.30 – PM Break	Level 3 Meeting Room Foyers
10.30 to 11.00 – AM Poster	3.00 to 3.30 – PM Poster	Level 3 Venus I Poster Room

Daily Lunches: 12.30 to 1.30pm Daily

- **9 Dec – Tue & 10 Dec – Wed**
  - Lunch Buffet (International) — Level 2 The SQUARE
  - Lunch Buffet (Full Halal) — Level 3 KINTAMANI Indonesian
- **11 Dec – Thu**
  - Stand-up Lunch Buffet — Level 3 Meeting Room Foyers

9 Dec – Tue: Opening, Keynote Presentations & Concurrent Sessions

8.00 to 8.45am	Registration Desk Opens	Level 3 Foyer
8.45 am	Guests & Delegates to be seated	Level 3 Venus Ballroom II & III
9.00 to 9.45am	Opening & Keynote I p.9	Level 3 Venus Ballroom II & III
9.45 to 10.30am	Keynote II p.10	Level 3 Venus Ballroom II & III

Oral & Poster Presentations	**11.00am – 12.30pm**	**1.30 – 3.00pm**	**3.30 – 5.30pm**
Venus II	Technology & Knowledge Management 1 p.14	Technology & Knowledge Management 2 p.14	Technology & Knowledge Management 3 p.14
Jupiter I	Operations Research 1 p.15	Operations Research 2 p.15	Operations Research 3 p.15
Jupiter II	Quality Control & Management 1 p.16	Quality Control & Management 2 pg.16	Engineering Economy & Cost Analysis p.16
Jupiter III	Production Planning & Control 1 p.17	Production Planning & Control 2 p.17	Production Planning & Control 3 p.17
Mercury I	Decision Analysis & Methods 1 p.18	Decision Analysis & Methods 2 p.18	Decision Analysis & Methods 3 p.18
Mercury II	Reliability & Maintenance Engineering 1 p.19	Reliability & Maintenance Engineering 2 p.19	Reliability & Maintenance Engineering 3 p.19
Mercury III	Service Innovation & Management 1 p.20	Service Innovation & Management 2 p.20	Service Innovation & Management 3 p.20
Venus I	Poster Session 1 p.21 - 22		

Optional Evening Tour (PLEASE PRESENT TICKET TO COACH DRIVER)

- Night Safari Tour — Coach Departs Hotel 6pm and Return to Hotel by 11pm

Program Overview (cont'd)

10 Dec – Wed: Keynote Presentation & Concurrent Sessions

8.00 to 8.45am	Registration Desk Opens	Level 3 Foyer
8.45 am	Guests & Delegates to be seated	Level 3 Venus Ballroom II & III
9.00 to 9.45am	Keynote III p.11	Level 3 Venus Ballroom II & III

Oral & Poster Presentations	**11.00am – 12.30pm**	**1.30 – 3.00pm**	**3.30 – 5.30pm**
Venus II	Technology & Knowledge Management 4 p.23	Technology & Knowledge Management 5 p.23	Technology & Knowledge Management 6 p.23
Jupiter I	Decision Analysis & Methods 4 p.24	Decision Analysis & Methods 5 p.24	Project Management 1 p.24
Jupiter II	Supply Chain Management 1 p.25	Supply Chain Management 2 p.25	Supply Chain Management 3 p.25
Jupiter III	Facilities Planning & Management p.26	Manufacturing Systems 1 p.26	Manufacturing Systems 2 p.26
Mercury I	Engineering Education & Training p.27	Safety, Security & Risk Management 1 p.27	Safety, Security & Risk Management 2 p.27
Mercury II	Reliability & Maintenance Engineering 4 p.28	Reliability & Maintenance Engineering 5 p.28	Systems Modeling & Simulation 1 p.28
Mercury III	E-business & E-commerce 1 p.29	E-business & E-commerce 2 p.29	Information Processing & Engineering p.29
Venus I	Poster Session 2 p.30 - 31		

10 Dec – Wed: IEEM2008 Conference Dinner – Includes Fun Ride on THE SINGAPORE FLYER

(Please Present Dinner Ticket At Gate. Registration Fee At Student Rate Excludes Conference Dinner.)

- Coach departs hotel from 5.15pm; Last Bus leaves by 5.45pm
- Function starts 6pm
- Coach departs dinner venue from 9pm; Last Bus leaves by 9.30pm

11 Dec – Thu: Concurrent Sessions

8.30 to 11.30am	Registration Desk Opens	Level 3 Foyer

Oral & Poster Presentations	**9.00am – 10.30am**	**11.00am – 12.30pm**
Venus II	Systems Modeling & Simulation 2 p.32	Systems Modeling & Simulation 3 p.32
Jupiter I	Project Management 2 p.32	Project Management 3 p.33
Jupiter II	Supply Chain Management 4 p.33	Supply Chain Management 5 p.33
Jupiter III	Global Manufacturing & Management 1 p.34	Global Manufacturing & Management 2 p.34
VIP Room	Human Factors 1 p.34	Human Factors 2 p.35
Venus III	Intelligent Systems p.35	Quality Control & Management 3 p.35
Venus I	Poster Session 3 p.36	

Keynote Presentations

Tue – 9 Dec, 9.00 to 9.45am

The Nexus Between Creativity and Innovation at the National Library Board

N Varaprasad, PhD
Chief Executive,
National Library Board, Singapore

ABSTRACT
The National Library Board, through the National Library Singapore and the network of Public Libraries provides a trusted and globally-connected library and information service designed to promote a knowledgeable and engaged society.

In this paper, the keynote speaker will explore the nexus between Creativity and Innovation and explain how the Board has used this to generate creative ideas and develop innovative applications that have marked out NLB as a one of the most enterprising and leading edge library systems in the world. In doing so, it has transformed libraries in Singapore as lifestyle destinations, but also worldwide as many metropolitan libraries have come here to study its success story and replicate it at home.

ABOUT THE KEYNOTE SPEAKER
Dr N Varaprasad is a lifelong educator, starting his career in 1972 at the Faculty of Engineering, University of Singapore. In 1985, he ventured into educational management and leadership in the polytechnic sector, becoming founding Principal of Temasek Polytechnic in 1990.

In 2001, he returned to the National University of Singapore as Deputy President in overseeing the Corporate cluster. Since 2004, he has been Chief Executive of the NLB, responsible for developing the National and Public libraries in Singapore to promote a vibrant, creative and engaged society. In June 2005, he launched the Library2010 strategic plan, "Libraries for Life, Knowledge for Success", aimed at bringing the libraries into the digital world.

In January 2008, he was one of only two Singaporeans to be named "Champion of Creativity" by the American Creativity Association, for his work in transforming polytechnic education in Singapore.

Keynote Presentations

Tue – 9 Dec, 9.45 to 10.30am

Process Mining and RFID

Dennis K.J. Lin
University Distinguished Professor
Penn State University - USA

ABSTRACT
A well-defined business process which reflects the dependencies among tasks is desirable for modern business intelligent. Processes are typically modelled as annotated activity graphs. The traditional method is using the workflow paradigm to prescribe how business processes should be performed. Process mining (or Workflows mining), on the other hand, is to construct process models from event logs of past (the data). This technique aims at improving the underlying processes by providing techniques and tools for discovering process, control, data, organizational, and social structures from event logs. The discovered information can be used to develop new systems that support the execution of business processes or as a feedback tool that helps in analyzing and improving the performed business processes. Process mining raises a number of interesting scientific questions coming to several kinds of the challenges of process mining.

This talk will first introduce the general idea and the objectives of our study. The existing algorithms for process mining will be discussed and compared. A new algorithm which is especially good for the case when the event logs (data) contain errors is proposed. Followed an overview of recent development on RFID (Radio Frequency Identification), a process mining application on RFID will be discussed.

ABOUT THE KEYNOTE SPEAKER
Dr. Dennis Lin is a University Distinguished Professor of Supply Chain Management and Statistics at the Penn State University. His research interests are quality assurance, industrial statistics, data mining and response surface. He has published near 150 papers in a wide variety of journals and is editor of Applied Stochastic Models for Business and Industry.

Dr. Lin is an elected fellow of the American Statistical Association (ASA), an elected member of International Statistical Institute (ISI), an elected fellow of American Society of Quality (ASQ), a lifetime member of International Chinese Statistical Association (ICSA), a fellow of the Royal Statistical Society (RSS), and has received the Most Outstanding Presentation Award from SPES, ASA. He is also the recipient of the 2004 Faculty Scholar Medal Award at Penn State University, and is currently a Chang-Jiang Scholar at Renmin University of China.

Keynote Presentations

Wed – 10 Dec, 9.00 to 9.45am

Industrial Engineering and Challenges in the Global Economy

E. A. Elsayed
Professor and Director of the NSF Center for Quality and Reliability Engineering, Rutgers University - USA

ABSTRACT
The economies of world countries are intertwined and are strongly dependent on each other. This has created many challenging opportunities for the industrial engineering profession. IEs play a major role in every aspect of the economy including manufacturing, production, transportation, energy and health care. Moreover, the customers expect "high" quality products at minimum cost and readily available. In this presentation, we will provide examples of challenges and opportunities for the IE professional to impact the global economy. We address issues related to the preparation of future IEs in order to play a more effective role in this economy.

ABOUT THE SPEAKER
Dr. E. A. Elsayed is a Professor in the Department of Industrial Engineering. He is also Director of the NSF / Industry / University Co-operative Research Center for Quality and Reliability Engineering, Rutgers-Arizona State University. He served as chairman of the Department of Industrial and Systems Engineering at Rutgers 1983-2001.

His research interests are in the areas of quality and reliability engineering and Production Planning and Control. He is a co-author of Quality Engineering in Production Systems, McGraw Hill Book Company, 1989. He is the author of Reliability Engineering, Addison-Wesley, 1996. These two books received the 1990 and 1997 IIE Joint Publishers Book-of-the-Year Award respectively. Dr. Elsayed is also a co-author of Analysis and Control of Production Systems, Prentice-Hall, 2nd Edition, 1994. Dr. Elsayed has served as the Editor-in-Chief of the IIE Transactions. He is also an Editor for the International Journal of Reliability, Quality and Safety Engineering. He serves on the editorial boards of other journals such as International Journal of Production Research and Computers and Industrial Engineering. Prof Elsayed received his MSc and BSc from University of Cairo, Egypt, and he has a PhD in Industrial Engineering from University of Windsor, Windsor, Canada.

Programs in Systems and Engineering Management Division

Nanyang Technological University, Singapore

www.ntu.edu.sg/mae/admin/divisions/sem/sem.asp

The Division of Systems and Engineering Management (SEM) is part of the School of Mechanical and Aerospace Engineering, which has 170 faculty members, and is one of the largest engineering Schools in the world: see, www.ntu.edu.sg/mae/.

Systems and Engineering Management includes topics such as Supply Chain and Logistics Management, Service systems including healthcare service, Human Factors Engineering, Project Management in Supply chain performance, Manufacturing systems and Design and Manufacturing of Mass Customized Products.

In the SEM Division there are 23 faculty members in the following areas of expertise:

1. Systems and Engineering Management
2. Human Factors Engineering
3. Logistics and Supply Chain Management
4. Biomedical Engineering Systems

Corresponding to these interests there are three NTU Centres in: Human Factors & Ergonomics, Supply Chain Management and Project Management and Advancement.

The Human Factors Group is the largest in Asia. The main interest is in improving Human Tasks & Activities and Interactions. This includes design of equipment and work procedures to enhance productivity and safety.

Research Programs

There are many research programs in SEM. As an example we mention CATER, which is the largest research program in SEM. It is sponsored by the European Commission, and there are 14 partners – most of which are in Europe.

The purposes are to:

- Design automobiles that appeal to customers through their exterior design – How can one design a car that looks cute?
- Set up a virtual environment on the web, where a buyer can customize the design of a car and then buy it.

M.Sc. Programs

The Master of Science program provides graduate level education. It is conducted both part-time (for people who work) and full-time. Applications for admission to the program are invited twice a year through announcements in the press prior to the commencement of the program in either August or January of the following year.

There are three M.Sc. Programs:

1. M.Sc. Human Factors Engineering
2. M.Sc. Logistics
3. M.Sc. Systems Engineering (New)

Research Programs

Ph.D. and M.Eng. are research-oriented programs. Here the student will take several courses, but most of the work is on reserch. The student will work together with an advisor, who will help to define a research topics and guide the student.

Typically a student will first take a M.Eng degree first and then continue to take a Ph.D. However, applicants with an outstanding bachelor's degree can be admitted directly into the Ph.D. program.

NANYANG TECHNOLOGICAL UNIVERSITY

Session Schedules

Technology and Knowledge Management 1

12/9/2008 11:00 - 12:30
Room: Venus 2

Chairs: Kah Hin Chai
Young C. Park

Abstracts: see page 38

- **A Small World in the Patent Citation Network**
  Shiu-Wan Hung[1], An-Pang Wang[1]
  [1]*National Central University, Taiwan*

- **Technological Complexity: a Support to Management Decisions for Product Engineering and Manufacturing**
  Giovanni Tani[1], Barbara Cimatti[1]
  [1]*University of Bologna, Italy*

- **Empirically Detecting the Hype Cycle with the Life Cycle Indicators: An Exploratory Analysis of Three Technologies**
  Heini Jarvenpaa[1], Saku Makinen[1]
  [1]*Tampere University of Technology, Finland*

- **Fostering Entrepreneurship through Technical Education for Sustainable Growth of Small and Medium Enterprises in India**
  Rajesh Jaware[1], V.P. Wani[2], Mukes Kumar Pandey[3]
  [1]*Sinhgad Institute of Business Administration & Computer Applications, India*
  [2]*National Institute of Technology, Kurukshetra, India*
  [3]*Rajiv Gandhi Proudyogiki Vishwavidyalaya, India*

- **Likelihood of Acquisition by Private Equity Fund in Semiconductor Packaging Industry**
  Chengter Ho[1], Hsi-Che Teng[2]
  [1]*National Kaohsiung University of Applied Sciences, Taiwan*
  [2]*Taiwan IC Packaging Co., Taiwan*

- **Research on Conflicts between Task Design and Execution in Knowledge Worker Team under Temporal Framing Effect**
  Guo Fang Yuan[1], Gang Zhang[1]
  [1]*Zhejiang University, China*

Technology and Knowledge Management 2

12/9/2008 13:30 - 15:00
Room: Venus 2

Chairs: Chengter Ho
Shieuhong Lin

Abstracts: see page 39

- **The Role of Knowledge Sharing and Transactive Memory System on Condition Based Maintenance Policy**
  Javid Koochaki[1], Inge Bouwhuis[1]
  [1]*University of Groningen, Netherlands*

- **KMS Adoption in Organizations**
  Arman Kaldi[1], Abdollah Aghaie[1], Farid Khoshalhan[1]
  [1]*K. N. Toosi University of Technology, Iran*

- **Process-Centered Knowledge Model for Continuous Process Improvement**
  Kwan Hee Han[1], Jun Woo Park[1], Young Hyo Jo[1]
  [1]*Gyeongsang National University, South Korea*

- **R&D Resource Allocation and Linkage with Business Strategies-A Technology Lifecycle Perspective**
  Sheng-Shyr Cheng[1], Hwey-Chyi Lee[1]
  [1]*Chang Jung Christian University, Taiwan*

- **An Integrative Framework of Knowledge Management Enabled Supply Chain Management**
  R. Kant[1], M.D Singh[1]
  [1]*Motilal Nehru National Institute of Technology, Allahabad, India*

- **A New Approach to Innovation Management in SMEs**
  Andrew Wait[1], Rainer Seidel[1], Manuel Seidel[1]
  [1]*The University of Auckland, New Zealand*

Technology and Knowledge Management 3

12/9/2008 15:30 - 17:30
Room: Venus 2

Chairs: Alan Pilkington
Barbara Cimatti

Abstracts: see page 40

- **Performance Analysis for Enterprise Resource Planning Systems**
  Shin-Guang Chen[1], Yi-Kuei Lin[2]
  [1]*Tungnan University, Taiwan*
  [2]*National Taiwan University of Science and Technology, Taiwan*

- **Innovation Problems Associated with the Dynamic Growth of Chinese University Spin-outs: A Conceptual Framework**
  Yuan Zhou[1], Charles Hampden-Turner[1]
  [1]*University of Cambridge, United Kingdom*

- **A Tool for Understanding and Measuring End-User e-Business Competency**
  Chui Young Yoon[1], Keon Myung Lee[1]
  [1]*Chungbuk National University, South Korea*

- **Constructing On-line Knowledge Sharing Model for R&D Staff: an Empirical Study in Taiwan**
  Chung-Hsiung Fang[1], Chao-Tan Ko[1], Ya-Chin Kang[1], Guan-Li Chen[1]
  [1]*National Taiwan Normal University, Taiwan*

- **Performance Index and Productivity Analysis for National R&D Funding in Science and Technology**
  So Young Sohn[1], Jin Young Choi[1]
  [1]*Yonsei University, South Korea*

- **The Classification of Information Technology on the Perspective of Obtaining Competitive Advantage and Information Technology Capability**
  Yiming Xiang[1], Yonggang Shu[1]
  [1]*Zhejiang Gongshang University, China*

- **The Determinants of the Growth of Absorptive Capacity Based on an Open Innovation Perspective: A Case Study**
  Jin Chen[1], Wangfang Li[2], Wim Vanhaverbeke[3], Zijun Jiang[1]
  [1]*Zhejiang University, China*
  [2]*Hasselt University, Eindhoven University of Technology, Belgium*
  [3]*Hasselt University, Belgium*

- **Innovative Strategies for Intelligent Robot Industry in Korea**
  So Young Sohn[1], Man Jae Kim[1]
  [1]*Yonsei University, South Korea*

Operations Research 1

12/9/2008 11:00 - 12:30
Room: Jupiter 1

Chairs: Yuri Popkov
Alireza Haji

Abstracts: see page 41

- **Mathematical Programming Approach for Routing Home Care Nurses**
  Bouazza Elbenani[1], Jacques A. Ferland[2], Viviane Gascon[3]
  [1]*Université Mohammed V-Agdal, Morocco*
  [2]*Université de Montréal, Canada*
  [3]*Université du Québec à Trois-Rivières, Canada*

- **A DSS for Stochastic Multistage Portfolio Optimization in the Mexican Market**
  Maria A. Osorio[1], Erika Jimenez[1], Abraham Sanchez[1]
  [1]*Universidad Autonoma de Puebla, Mexico*

- **An Improved Numerical Method for Solving a Class of Continuous-time Linear Programming Problems**
  Ching-Feng Wen[1], Chien-Shih Huang[2]
  [1]*Kaohsiung Medical University, Taiwan*
  [2]*National Kaohsiung University of Applied Sciences, Taiwan*

- **Fuzzy Multilevel Multiobjective Programming Problems with Fuzzy Domination Structures**
  Hitoshi Yano[1]
  [1]*Nagoya City University, Japan*

- **Analyzing Total Knee Arthroplasty Using Surgical Volume of Different Hospital Levels**
  Yu-Tien Cheng[1], Ching-Hsue Cheng[1], Jr-Shian Chen[2]
  [1]*National Yunlin University of Science and Technology, Taiwan*
  [2]*Hungkuang University, Taiwan*

- **A Simple and Effective heuristic for Periodic Vehicle Routing Problem**
  Ahmad Reza Pourghaderi[1], Reza Tavakkoli-Moghaddam[1], Mehdi Alinaghian[1], Behnam Beheshti-pour[1]
  [1]*University of Tehran, Iran*

Operations Research 2

12/9/2008 13:30 - 15:00
Room: Jupiter 1

Chairs: Jacques A. Ferland
Tiefeng Zhang

Abstracts: see page 42

- **Data and GP Modeling Framework for Manpower Planning: The Case of Fixed-length Duties**
  Sydney Chu[1], Minyue Zhu[1]
  [1]*University of Hong Kong, Hong Kong*

- **Bottleneck Adjacent Matching 3 (BAM3) Heuristic For Re-Entrant Flow Shop With Dominant Machine**
  Salleh Ahmad Bareduan[1], Sulaiman Hasan[1]
  [1]*Universiti Tun Hussein Onn Malaysia, Malaysia*

- **Bottleneck Adjacent Matching 4 (BAM4) Heuristic For Re-Entrant Flow Shop With Dominant Machine**
  Salleh Ahmad Bareduan[1], Sulaiman Hasan[1]
  [1]*Universiti Tun Hussein Onn Malaysia, Malaysia*

- **An Algorithm for Optimal Cyclic Scheduling in a Robotic Cell with Flexible Processing Times**
  Pengyu Yan[1], Chengbin Chu[2], Ada Che[3], Naiding Yang[3]
  [1]*Northwestern Polytechnical University, Universiteé de Technologie de Troyes, France*
  [2]*Universiteé de Technologie de Troyes, France*
  [3]*Northwestern Polytechnical University, China*

- **A Heuristic Procedure Based on Column Generation to Solve a Cutting Stock Problem**
  Ya Liu[1], Chengbin Chu[2], Kanliang Wang[3]
  [1]*Université de technologie de Troyes, France*
  [2]*Université de technologie de Troyes, Xi'an Jiaotong University, France*
  [3]*Xi'an Jiaotong University, China*

- **Scatter Search for Multi-mode Resource-constrained Project Scheduling Problems**
  Ahmad Reza Pourghaderi[1], Seyed Ali Torabi[1], Jafar Talebi[1]
  [1]*University of Tehran, Iran*

Operations Research 3

12/9/2008 15:30 - 17:30
Room: Jupiter 1

Chairs: Sydney Chu
Pengyu Yan

Abstracts: see page 43

- **Analysis of the Positive Dynamic Systems with Entropy Operator: Application to Image Restoration from Projections**
  Yuri Popkov[1]
  [1]*Institute for Systems Analysis, Russian Federation*

- **Markov Chain with Fuzzy States: Application to Queuing Decision Models**
  David de la Fuente[1], Maria Jose Pardo[2]
  [1]*University of Oviedo, Spain*
  [2]*Basque Country University, Spain*

- **Solving Two Dimensional Layout Optimization Problems with Irregular Shapes by Using Meta-heuristic**
  Kumaran Ramakrishnan[1], Julia Bennell[1], Mohamed K. Omar[2]
  [1]*University of Southampton, United Kingdom*
  [2]*Multimedia University, Malaysia*

- **Project Scheduling for Maximum NPV with Variable Activity Durations and Uncertain Activity Outcomes**
  Stefan Creemers[1], Roel Leus[1], Bert De Reyck[2], Marc Lambrecht[1]
  [1]*Katholieke Universiteit Leuven, Belgium*
  [2]*University College London, United Kingdom*

- **Optimal Control with DAE Constraints**
  Zhihui Yang[1], Wenjuan Cui[1], Yun Tang[2]
  [1]*North China University of Technology, China*
  [2]*Tsinghua University, China*

- **Assessing the Performance of Distribution Lines Based on Data Envelopment Analysis**
  Tiefeng Zhang[1], Jinsha Yuan[1], Xiaozhi Li[1]
  [1]*North China Electric Power University, China*

- **Developing a Partial Backlogging Deteriorating Inventory Model with Selling Price Dependant Demand Rate and Cycle Length Dependant Selling Price**
  Alireza Haji[1], Hamed Sabahno[1], Rasoul Haji[1]
  [1]*Sharif University of Technology, Iran*

Quality Control and Management 1

12/9/2008 11:00 - 12:30
Room: Jupiter 2

Chairs: Zhang Wu
Rassoul Noorossana

Abstracts: see page 44

- **Economic Influences on Customer Satisfaction: Variation by Product Function**
  Bjoern Frank[1], Takao Enkawa[1]
  [1]*Tokyo Institute of Technology, Japan*

- **Quality Control of Fan Beam Scanning Data Processing with in Vitro Material**
  Jan Pieter Clarys[1], Steven Provyn[1], Joanne Wallace[2], Aldo Scafoglieri[1], Thomas Reilly[3]
  [1]*Vrije Universiteit Brussel, Belgium*
  [2]*Vrije Universiteit Brussel, Liverpool John Moores University, United Kingdom*
  [3]*Liverpool John Moores University, United Kingdom*

- **Analysis of Consumers' Requirements for Data/Information Quality by Using HOQ**
  Keqin Wang[1], Shurong Tong[1], Lionel Roucoules[2], Benoit Eynard[3]
  [1]*Northwestern Polytechnical University, China*
  [2]*University of Technology of Troyes, France*
  [3]*University of Technology of Compiegne, France*

- **An EWMA Control Chart for Monitoring the Mean of Skewed Populations Using Weighted Variance**
  Michael Boon Chong Khoo[1], Abdu Mohammed Ali Atta[1]
  [1]*Universiti Sains Malaysia, Malaysia*

- **Dynamic Benchmarking Methodology for Quality Function Deployment**
  Hendry Raharjo[1], Aarnout Brombacher[2], Kah-Hin Chai[3], Bo Bergman[1]
  [1]*Chalmers University of Technology, Sweden*
  [2]*Eindhoven University of Technology, Netherlands*
  [3]*National University of Singapore, Singapore*

- **Markov Chain Approximation to the Performance of Adaptive CUSUM Procedures**
  Lianjie Shu[1], Wei Jiang[2], Zhang Wu[3]
  [1]*University of Macau, Macau*
  [2]*Stevens Institute of Technology, United States*
  [3]*Nanyang Technological University, Singapore*

Quality Control and Management 2

12/9/2008 13:30 - 15:00
Room: Jupiter 2

Chairs: Michael Boon Chong Khoo
Huiming Zhu

Abstracts: see page 45

- **Identifying the Time of a Step-change with MEWMA Control Charts by Artificial Neural Network**
  Farzane Ahmadzade[1], Rassoul Noorossana[2]
  [1]*Islamic Azad University of Karaj Branch, Iran*
  [2]*Iran University of Science and Technology, Iran*

- **Optimization of Injection Molding Process for Automobile Headlamp Brackets**
  Li-Chang Chao[1]
  [1]*Diwan University, National Chiao Tung University, Taiwan*

- **A Theory of Thermal Growth Control Techniques for High Speed Spindles**
  Ching-Feng Chang[1], Ching-Yi Chao[1], Chao-Shi Ling[2], Jin-Jia Chen[1], Tsair-Rong Chen[1]
  [1]*National Changhua University of Education, Taiwan*
  [2]*Da Yeh University, Taiwan*

- **An X-Bar Control Chart Economic Design Sampling Strategy for Non-normally Distributed Data under Gamma (λ, 2) Failure Models**
  Feng-Chia Li[1], Cho Hua Yeh[2], Peng-Kai Wang[3]
  [1]*National Tsinghua University, Taiwan*
  [2]*Jen Teh Junior College of Management, Taiwan*
  [3]*Hwa Hsia Institute of Technology, Taiwan*

- **An Adaptive CUSUM Chart with Exponential of Mean Shift**
  Zhang Wu[1], Mei Yang[1]
  [1]*Nanyang Technological University, Singapore*

- **The Effect of Non-normality on the Performance of Linear Profile Monitoring**
  Rassoul Noorossana[1], Abolfazl Vaghefi[2], Mehdi Dorri[1]
  [1]*Islamic Azad University South Tehran Branch Graduate School, Iran*
  [2]*Iran University of Science and Technology, Iran*

Engineering Economy and Cost Analysis

12/9/2008 15:30 - 17:30
Room: Jupiter 2

Chairs: David de la Fuente
Gyutai Kim

Abstracts: see page 46

- **On the Applicability of the Kelly Criterion to Engiineering Economics**
  Gyutai Kim[1]
  [1]*Chosun University, South Korea*

- **The Influence of Structural Complexity on Product Costs**
  Stefanie Braun[1], Udo Lindemann[1]
  [1]*Technische Universitaet Muenchen, Germany*

- **Applying Performance Management on Semiconductor Design Processes**
  Neele Hinrichs[1], Erich Barke[1]
  [1]*Leibniz Universität Hannover, Germany*

- **Using Historical Data for Forecasting S-curves at Construction Industry**
  Mohhammad Taghi Banki[1], Behzad Esmaeeli[1]
  [1]*Amirkabir University, Iran*

- **Analysis of Software Quality Cost Modeling's Industrial Applicability with Focus on Defect Estimation**
  Lars Karg[1], Arne Beckhaus[1]
  [1]*SAP Research, Germany*

- **A Production Economics Model for Predictive Cost Assessment in Manufacturing**
  Q.Z. Yang[1], R.S. Ng[1], B. Song[1]
  [1]*Singapore Institute of Manufacturing Technology, Singapore*

- **Digital Technical Documentation Development: Migration of Paper based Support Systems within Submarine Periscope Engineering**
  Robbie Thomson[1], John Lynn[2]
  [1]*Thales Optronics, United Kingdom*
  [2]*Glasgow Caledonian University, United Kingdom*

Production Planning and Control 1

12/9/2008 11:00 - 12:30
Room: Jupiter 3

Chairs: Hans Otto Guenther
Duy Long Ha

Abstracts: see page 47

- **Identification of Implicit Strategies In Production Control**
  Gunther Reinhart[1], Tobias Gyger[1]
  [1]*Technische Universität München, Germany*

- **Optimal Balancing of Multi-Objective U-Shaped Assembly Lines using the TSGA Method**
  Supaporn Suwannarongsri[1], Deacha Puangdownreong[1]
  [1]*South-East Asia University, Thailand*

- **Multi-Objective Assembly Line Balancing via Adaptive Tabu Search Method with Partial Random Permutation Technique**
  Supaporn Suwannarongsri[1], Deacha Puangdownreong[1]
  [1]*South-East Asia University, Thailand*

- **Scheduling Incompatible Job Families on A Single Machine: A Two-Level Heuristic Approach**
  Mohamed K. Omar[1], Yasothei Suppiah[1], Siew Chein Teo[1], Julia Bennell[2]
  [1]*Multimedia University, Malaysia*
  [2]*University of Southampton, United Kingdom*

- **Effects of Organizational Innovations on Firm's Production Performance**
  Gunduz Ulusoy[1], Gurhan Gunday[1], Lutfihak Alpkan[2], Kemal Kilic[1]
  [1]*Sabanci University, Turkey*
  [2]*Gebze Institute of Technology, Turkey*

- **Case Based Polishing Process Planning with Fuzzy Set Theory**
  BKK Ngai[1], George Q. Huang[1], Yingfeng Zhang[2], Xin Chen[3], Victor Lo[1]
  [1]*The University of Hong Kong, China*
  [2]*The University of Hong Kong, Xi'an Jiaotong University, China*
  [3]*Guangdong University of Technology, China*

Production Planning and Control 2

12/9/2008 13:30 - 15:00
Room: Jupiter 3

Chairs: Adam T.S. Ng
Kenneth Sörensen

Abstracts: see page 48

- **A Genetic Algorithm-based Approach to Job Shop Scheduling Problem with Assembly Stage**
  Felix. T. S. Chan[1], T. C. Wong[2], L. Y. Chan[1]
  [1]*University of Hong Kong, Hong Kong*
  [2]*Hong Kong Polytechnic University, Hong Kong*

- **An Approach for Home Load Energy Management Problem in Uncertain Context**
  Duy Long Ha[1], Minh Hoang Le[1], Stéphane Ploix[1]
  [1]*INPGrenoble, France*

- **Scheduling on Identical Machines with Batch Arrivals in Semiconductor Testing House**
  Tsui-Ping Chung[1], Ching-Jong Liao[1], L. H. Su[2]
  [1]*National Taiwan University of Science and Technology, Taiwan*
  [2]*Chung-Yuan Christian University, Taiwan*

- **A Heuristic For Parallel Machine Scheduling With Machine Preference For The Electroetching Of Aluminium Foil**
  Chien-Wen Chao[1], Ming-Chou Chuang[1], Ching-Jong Liao[1]
  [1]*National Taiwan University of Science and Technology, Taiwan*

- **Process Sequence Optimization Based on Constraint Matrix**
  Yujin Hu[1], Zhengyi Zhang[1], Ling Ling[1], Xuelin Wang[1], Weijun Huang[1]
  [1]*Huazhong University of Science and Technology, China*

- **Towards a Learning Curve Theory for Batch Production**
  Anna Chatzimichali[1], Vassilios Tourassis[1]
  [1]*Democritus University of Thrace, Greece*

Production Planning and Control 3

12/9/2008 15:30 - 17:30
Room: Jupiter 3

Chairs: George Q. Huang
Kemal Kilic

Abstracts: see page 49

- **The Block Planning Approach: a Case Study Application from the Beverage Industry**
  Hans-Otto Günther[1]
  [1]*Berlin Institute of Technology, Germany*

- **Human Resource Planning with Worker Attendance Uncertainty**
  Adam T.S. Ng[1], Huei-Chuen Huang[1], Junyong Ng[1]
  [1]*National University of Singapore, Singapore*

- **Integrated Production Planning for the Multiple-machine Sheet Metal Shop with Laser Cutting and Air Bending**
  Bart Verlinden[1], Kenneth Sorensen[1], Dirk Cattrysse[1], Herman Crauwels[2], Dirk Van Oudheusden[1]
  [1]*Katholieke Universiteit Leuven, Belgium*
  [2]*Lessius Hogeschool - De Nayer Instituut, Belgium*

- **A Two-Stage Method with Mixed Integer Quadratic Programming for Unit Commitment with Ramp Constraints**
  Ran Quan[1], Jinbao Jian[1], Haiyan Zheng[1], Linfeng Yang[1]
  [1]*Guangxi University, China*

- **Minimization of Weighted Tardiness and Makespan in an Open Shop Environment by a Novel Hybrid Multi-objective Meta-heuristic Method**
  Reza Tavakkoli-Moghaddam[1], Hadi Panahi[1], Mojtaba Haydar[2]
  [1]*University of Tehran, Iran*
  [2]*Islamic Azad University South Tehran Branch, Iran*

- **Affection of Transmission Line Limits on Dynamic Behavior**
  Mu Lin[1], Zhihui Yang[2], Yun Tang[1]
  [1]*Tsinghua University, China*
  [2]*North China University of Technology, China*

- **Performance Evaluation of Workflow Scheduling Strategies Considering Transportation Times and Conveyor Failures**
  Munir Merdan[1], Thomas Moser[1], Dindin Wahyudin[1], Stefan Biffl[1]
  [1]*Vienna University of Technology, Austria*

Decision Analysis and Methods 1

12/9/2008 11:00 - 12:30
Room: Mercury 1

Chairs: Songlin Chen
Shi-Woei Lin

Abstracts: see page 50

- **Multi-criteria Selection of Alternatives for Sustainable Urban Transportation**
  Orhan Feyzioglu[1], Mehmet Sakir Ersoy[1], Gulcin Buyukozkan[1]
  [1]*Galatasaray University, Turkey*

- **Comparison of Feature Selection Approaches based on the SVM Classification**
  Feng-Chia Li[1], Fei-long Chen[1], Gwo-En Wang[2]
  [1]*National Tsinghua University, Taiwan*
  [2]*Junior Medical College of Jen-Teh, Taiwan*

- **Developing a Fuzzy ANP Model for Selecting the Suitable Dispatching Rule for Scheduling a FMS**
  Soheil Sadinejhad[1], Hosein Didehkhani[2], S.M. Seyedhosseini[2]
  [1]*Industrial Management Institue, Iran*
  [2]*Islamic Azad University, Science and Research Branch, Iran*

- **A Fuzzy Group Decision-making Approach to Evaluate a Mobile Technology for Logistics Industry**
  Gulcin Buyukozkan[1], Jbid Ani Arsenyan[1]
  [1]*Galatasaray University, Turkey*

- **A Two Phase Fuzzy Decision Making Methodology for Bridge Scheme Selection**
  S. M. Mousavi[1], Hooman Malekly[2], Hassan Hashemi[3], S. M. H. Mojtahedi[1]
  [1]*Islamic Azad University South Tehran Branch, Iran*
  [2]*Islamic Azad University-South Tehran Branch, Member of Young Researchers Club, Iran*
  [3]*Sazeh-Ara Research Center, Member of Young Researchers Club, Iran*

- **An Optimization Framework for Multistage Production-distribution Networks Using Genetic Algorithms**
  Kim Teng Lai[1], Lee Luong[1], Romeo Marian[1]
  [1]*University of South Australia, Australia*

Decision Analysis and Methods 2

12/9/2008 13:30 - 15:00
Room: Mercury 1

Chairs: Hwey-Chyi Lee
Chih-Cheng Chen

Abstracts: see page 51

- **Can Cooke's Model Sift Out Better Experts and Produce Well-Calibrated Aggregated Probabilities?**
  Shi-Woei Lin[1], Chih-Hsing Cheng[1]
  [1]*Yuan Ze University, Taiwan*

- **The Predictive Accuracy of Feed Forward Neural Networks and Multiple Regression in the Case of Heteroscedastic Data**
  Mukta Paliwal[1], Usha Anantha Kumar[1]
  [1]*Indian Institute of Technology-Bombay, India*

- **Structural Metrics for Decision Points within Multiple-domain Matrices Representing Epc Processes**
  Matthias Kreimeyer[1], Matthias Gürtler[1], Udo Lindemann[1]
  [1]*Technische Universitaet Muenchen, Germany*

- **A Strategic Analysis of Intangible Factors in Technology Investment**
  Lilian Borges[1], Kim Tan[1]
  [1]*Nottingham University, United Kingdom*

- **Using DEMATEL to Explore the Interaction Effect of Team Innovation Factors**
  Lien-An Hsu[1], Hsu-Feng Hung[2], Ting-Chun Lu[2]
  [1]*National Chengchi University, Taiwan*
  [2]*National ChengChi University, Taiwan*

- **Exploration of Intelligent System in Decision Making - Relationship of Fuzzy Error Logic Decomposition Word T^{f} and Connotative Antithesis ┼nhdl**
  Qiwei Guo[1], Qinruo Wang[1], Kaizhong Guo[1]
  [1]*Guangdong University of Technology, China*

Decision Analysis and Methods 3

12/9/2008 15:30 - 17:30
Room: Mercury 1

Chairs: Soheil Sadinejad
Yves De Smet

Abstracts: see page 52

- **A Model for Evaluating the Performance of the Strategic Plan Using an Analytic Approach**
  Abbas Toloie Eshlagy[1], R. Radfar[1], M. Bahrampour Kivi[1]
  [1]*Islamic Azad University Science & Research Branch, Iran*

- **A Study of Degrees of Technology Leverage – In-House R&D versus Imported Technology**
  Hwey-Chyi Lee[1], Sheng-Shyr Cheng[1]
  [1]*Chang Jung Christian University, Taiwan*

- **Formulating a Robust Strategy Using Scenario Programming with a Fuzzy Logic Approach**
  Reza Radfar[1], A. Toloie Eshlaghy[1], N. Vartanyans[1]
  [1]*Islamic Azad University Science & Research Branch, Iran*

- **Priority of strategic plans in BSC model by using of Group Decision Making Model**
  Javad Dodangeh[1], Javad Jassbi[2], Morteza Mousakhani[1], Mohammad Anisseh[3], Rosnah Binti Mohd. Yusuff[4]
  [1]*Islamic Azad University Qazvin Branch, Iran*
  [2]*Islamic Azad University Science & Research Branch, Iran*
  [3]*University Electrical & Computer Research Center, Iran*
  [4]*University Putra Malaysia, Malaysia*

- **Critical Factors of Team Innovation Ranked by SAW, TOPSIS, and GRA**
  Lien-An Hsu[1], Hsu-Feng Hung[2], Ting-Chun Lu[2]
  [1]*National Chengchi University, Taiwan*
  [2]*National ChengChi University, Taiwan*

- **Analysis of Brownfield Redevelopment by Evolutionary Game**
  Yanhua Liang[1], Peng Guo[1], Junfei Hu[1]
  [1]*Northwestern Polytechnical University, China*

- **A Fuzzy Regression Approach To Hierarchical Evaluation Model for Oil Palm Grading**
  Arbaiy Nureize[1], Junzo Watada[1]
  [1]*Waseda University, Japan*

Reliability and Maintenance Engineering 1

12/9/2008 11:00 - 12:30
Room: Mercury 2

Chairs: Lesley Walls
Gopinath Chattopadhyay

Abstracts: see page 53

- **Optimal Preventive Maintenance for a Device submitted to Random and Deteriorating Failures**
  Han Bao[1], Deepa Jaishankar[1]
  [1]*Old Dominion University, United States*

- **Evaluation of Technical Vs Economic Decisions in Rail Grinding**
  Venkatarami Reddy[1], Gopinath Chattopadhyay[2], Per-Olof Larsson-Kraik[3], Turgut Allahmanli[1]
  [1]*GHD Pty Ltd, Australia*
  [2]*Central Queensland University, Australia*
  [3]*Swedish National Rail Administration, Sweden*

- **Optimize a RFID-based Turbine Maintenance Model - a Preliminary Study**
  JrJung Lyu[1], Tung-Liang Chen[1]
  [1]*National Cheng Kung University, Taiwan*

- **Availability Analysis of Rubber Preparation System a Subsystem of a Tube Manufacturing Plant Under Preemptive Resume Priority Repair**
  Pardeep Gupta[1], A. Jayant[1], A. Goyal[2]
  [1]*Sant Longowal Institute of Engineering & Technology, India*
  [2]*National Institute of Technology, India*

- **Stability of a General Repairable Human-Machine System**
  Houbao Xu[1], Weihua Guo[2], Lina Guo[3]
  [1]*Beijing Institute of Technology, China*
  [2]*Zhengzhou University of Light Industry, China*
  [3]*Beijing Institute of Information and Control, China*

- **Reliability Centered Maintenance for Rolling Stock: A Case Study in Coaches' Wheel sets of Passenger Trains of Iranian Railway**
  Seyed Mohammad Rezvanizaniani[1], Mahmoud Valibeigloo[1], Mahdi Asghari[1], Javad Barabady[2], Uday Kumar[3]
  [1]*RAJA Passenger Trains Co, Iran*
  [2]*Tromsø University College, Norway*
  [3]*Luleå University of Technology, Sweden*

Reliability and Maintenance Engineering 2

12/9/2008 13:30 - 15:00
Room: Mercury 2

Chairs: Venkatarami Reddy
Om Prakash Yadav

Abstracts: see page 54

- **A Simple Bayesian Estimation of the Gumbel Distribution**
  Wanbo Lu[1]
  [1]*Southernwestern University of Finance and Economics, China*

- **Auxiliary Acceleration Factor for Sequential Accelerated Life Tests: A Case Study**
  Xiao Liu[1], Loon Ching Tang[1]
  [1]*National University of Singapore, Singapore*

- **Optimal Software Release Policy with Change-Point**
  Shinji Inoue[1], Shigeru Yamada[1]
  [1]*Tottori University, Japan*

- **Most Reliable Age Replacement Policy; A New Hazard Rate Analyzing Mathematical Model**
  Mohamad Mahdavi[1], Mojtaba Mahdavi[1]
  [1]*Islamic Azad University Najafabad Branch, Iran*

- **Reliability and Availability of a Continuous Casting Plant**
  Syed Rizwan[1], A G Mathew[1], Manik Majumder[2], K P Ramchandran[1]
  [1]*Caledonian (University) College of Engineering, Oman*
  [2]*NIT Durgapur, India*

Reliability and Maintenance Engineering 3

12/9/2008 15:30 - 17:30
Room: Mercury 2

Chairs: Pardeep Gupta
Shinji Inoue

Abstracts: see page 55

- **A Function Failure Analysis Method for Improving Reliability of the Product Based on Go-flow Methodology**
  Zhonghang Bai[1], Xiangdong Li[1], Runhua Tan[1], Benning Lian[1]
  [1]*Hebei University of Technology, China*

- **The Technical Reliability of Electrical Power Objects in the Formulation of Management Accountancy**
  Grazyna Dabrowska-Kauf[1]
  [1]*Wroclaw University of Technology, Poland*

- **Challenges of Asset Management in Power Transmission Network**
  Lutfiye Allahmanli[1], Gopinath Chattopadhyay[1], Gary Edwards[2]
  [1]*Central Queensland University, Australia*
  [2]*Powerlink Queensland, Australia*

- **A PCA-GA Approach for Weighted Voting System Optimization Based on Reliability, Cost and System Output Analyses**
  Vahid Ebrahimipour[1], Ali Azadeh[1], Shahrzad Faghih Roohi[1], Ehsan Shojaei[2], Amin Aalaei[3]
  [1]*University of Tehran, Iran*
  [2]*Islamic Azad University Abhar Branch, Iran*
  [3]*Mazandaran University of Science and Technology, Iran*

- **Resource Allocation: Sequential Design for Analyses Involving Several Types of Data**
  Christine Anderson-Cook[1], Todd Graves[1], Michael Hamada[1]
  [1]*Los Alamos National Laboratory, United States*

- **Extended Warranty Policies with Warranty Options**
  Alagar Rangan[1], Vahidhossein Khiabani[1]
  [1]*Eastern Mediterranean University, Turkey*

- **A Modified Imperfect Preventive Maintenance Policy under Reliability Limit**
  Mingchih Chen[1], Min Wang[1], Yu-Hung Chien[2]
  [1]*Chaoyang University of Technology, Taiwan*
  [2]*National Taichung Institute of Technology, Taiwan*

Service Innovation and Management 1

12/9/2008 11:00 - 12:30
Room: Mercury 3

Chairs: Kay Chuan Tan
Tianbiao Yu

Abstracts: see page 56

- **Crisis Response: the Message Strategies and Media Coverage Model**
  Jianxin Shi[1], Minglu Yu[1]
  [1]*Harbin Institute of Technology, China*

- **An Integrated Method of Kano Model and QFD for Designing Impressive Qualities of Healthcare Service**
  Chuang-Chun Chiou[1], Ya-Sheng Cheng[2]
  [1]*Dayeh University, Taiwan*
  [2]*National Taichung Institute of Technology, Taiwan*

- **Analysis of Key Features in IPTV Service Quality Model**
  Kwang-Jae Kim[1], Wan-Seon Shin[2], Dae-Kee Min[3], Hyun-Jin Kim[1], Jin-Sung Yoo[2], Hyun-Min Lim[4], Soo-Ha Lee[4], Yong-Kee Jeong[4]
  [1]*Postech, South Korea*
  [2]*Sungkyunkwan University, South Korea*
  [3]*SK Telecom, South Korea*
  [4]*KT Technologies Labs, South Korea*

- **Service Quality, Homebuyers' Regret and Dissatisfaction in China Real Estate Market**
  Jiang Tao Chen[1], Eddie C.M. Hui[2], Zhong Ming Wang[3]
  [1]*Zhejiang University, The Hong Kong Polytechnic University, China*
  [2]*The Hong Kong Polytechnic University, Hong Kong*
  [3]*Zhejiang University, China*

- **Reengineering Radiology Transcription Process through Voice Recognition**
  Balagopal Gopakumar[1], Shengyong Wang[1], Mohammad Khasawneh[1], Davette Cummings[2], Krishnaswami Srihari[1]
  [1]*State University of New York, Binghamton, United States*
  [2]*Wilson Memorial Regional Medical Center, United States*

- **A Complex Networks Analysis on the Service Businesses of VIP Customers of a Telecommunication Department**
  Jianmei Yang[1], Guangchao Huang[1], Jianyong Feng[1], Yufeng Lai[1]
  [1]*South China University of Technology, China*

Service Innovation and Management 2

12/9/2008 13:30 - 15:00
Room: Mercury 3

Chairs: Kwang-Jae Kim
Krishnaswami Srihari

Abstracts: see page 57

- **A Fuzzy Multi-objective Optimizing Scheduling for Operation Room in Hospital**
  Di Wang[1], Jiuping Xu[1]
  [1]*Sichuan University, China*

- **Exploring Innovation Model Combine with the Green Marketing to Consumer's Behavior Influence - a Case Study of a TFT-LCD Company**
  James K. C. Chen[1], Che-Fu Wang[2], Wen-Hsuan Tsai[2], Sin-Yi Lin[2]
  [1]*Asia University, National Chiao Tung University, Taiwan*
  [2]*Asia University, Taiwan*

- **The Analysis of Relationship Between Burnout, Engagement and Firm Performance-- Case Study in Hospitality Industry in China**
  Lei Wu[1]
  [1]*Hunan Normal University, China*

- **Meta-Service Oriented Collaborative Design Platform for Complex Product**
  Jia-qing Yu[1], Jianzhong Cha[1], Yiping Lu[1], Nan Li[1], Sha-sha Yao[1]
  [1]*Beijing Jiaotong University, China*

- **Research of Networked Technical Service Oriented Production Process Based on Multi-agent**
  Tianbiao Yu[1], Jing Zhou[1], Kai Zhao[1], Ge Yu[1], Wanshan Wang[1]
  [1]*Northeastern University, China*

- **An Application of OR and IE Technology in Bank Service System Improvement**
  Xiaobing Pei[1]
  [1]*Tianjin University of Technology, China*

Service Innovation and Management 3

12/9/2008 15:30 - 17:30
Room: Mercury 3

Chairs: Chuang-Chun Chiou
Jinghua Li

Abstracts: see page 58

- **New Service Development Using Gap-based Quality Function Deploment: Hall Service of Mobile Telecommunication Case**
  Lei Xu[1], Jinghua Li[1], Xin Liu[1]
  [1]*Zhejiang Gongshang University, China*

- **Utilisation of Product Lifetime Information Across Organizational Boundaries in the Development of Maintenance Services**
  Toni Ahonen[1], Ville Ojanen[2], Markku Reunanen[1], Marinka Lanne[1]
  [1]*VTT Technical Research Centre of Finland, Finland*
  [2]*Lappeenranta University of Technology, Finland*

- **Research and Analysis of Enterprise Capability Elements Based on Customer Value**
  Mingli Zhang[1], Wei Jia[2], Chenliang Li[2]
  [1]*Beijing University of Aeronautics & Astronautics, China*
  [2]*Harbin Institute of Technology, China*

- **The Industrial Services Reference Model**
  Marco Gerosa[1], Marco Taisch[1]
  [1]*Politecnico di Milano, Italy*

- **Predicting Bed Requirement for a Hospital Using Regression Models**
  Arun Kumar[1], Jianxin(Roger) Jiao[2], Sung Shim[3]
  [1]*RMIT University, Australia*
  [2]*Nanyang Technological University, Singapore*
  [3]*Seton Hall University, United States*

- **Workforce Planning in the Banking Sector - A Case Study**
  Veronique Limere[1], Hendrik Van Landeghem[1]
  [1]*Ghent University, Belgium*

- **Analysis for Critical Success Factors of Energy Performance Contracting (EPC) Projects in China**
  Yang Zhang[1], Qingmiao Han[2], Changbin Liu[1], Jinying Sun[3]
  [1]*Beijing University of Civil Engineering and Architecture, China*
  [2]*Harbin Institute of Technology, China*
  [3]*China Architecture Design and Research Group, China*

- **Competitive Strategy of Enterprise Based on the Principle of Ecological Niche**
  Xiaofeng Wang[1], Zhi-xiang Li[2], Pang Zhou[3]
  [1]*Hebei University of Science and Technology, Beijing Institute of Technology, China*
  [2]*Beijing Institute of Technology, China*
  [3]*Hebei University of Science and Technology, China*

Poster Session 1

12/9/2008 10:30 - 11:00, 15:00 - 15:30
Room: Venus 1

Technology and Knowledge Management 4

12/10/2008 11:00 - 12:30
Room: Venus 2

Chairs: Shin-Guang Chen
Hongyi Sun

Abstracts: see page 64

- **Intellectual Capital and Firm Performance in Chinese Creative Industry Firms**
  Ruyan Hong[1], Xiaobo Wu[2], Xinmin Peng[3]
  [1]*Zhejiang University, Hangzhou Normal University, China*
  [2]*Zhejiang University, China*
  [3]*Zhejiang University, Zhejiang Wanli Universiy, China*

- **The Relationship on Information Technology Capability and Performance: An Empirical Research in the Context of China's Yangtze River Delta Region**
  Hao Jiao[1], I. C. Chang[1], Y. Lu[1]
  [1]*Fudan University, China*

- **Performance Measurement System and Staff Perceptions of Learning: Empirical Evidence from China**
  Xinwei Yuan[1], JinRen Wang[1], JingBing Yi[2]
  [1]*Xi'an University of Technology, China*
  [2]*Xi'an Jiaotong University, China*

- **Challenging Work as a Mediator of the Relationship Between Time Pressure and Employee Creativity in R&D Organizations**
  Lien-An Hsu[1], Hsueh-Liang Fan[1]
  [1]*National Chengchi University, Taiwan*

- **Research on Uniform Product Development Model**
  JingChang Shangguan[1], Yan Yan[1], Houfang Sun[1], Runhong Wang[1], Liqun Wang[1], Haitao Liu[2]
  [1]*Beijing Institute of Technology, China*
  [2]*Shandong Wuzheng Group Ltd. Co., China*

- **The Evolution of Knowledge Network in Manufacturing Cluster: A Case in China**
  Jingjing Guo[1], Bin Guo[1]
  [1]*Zhejiang University, China*

Technology and Knowledge Management 5

12/10/2008 13:30 - 15:00
Room: Venus 2

Chairs: Chui Young Yoon
Wim Vanhaverbeke

Abstracts: see page 65

- **Does Technological Performance Gap Drive Product Performance?: An Explorative Study of Personal Computer Gaming**
  Ozgur Dedehayir[1], Saku Makinen[1]
  [1]*Tampere University of Technology, Finland*

- **Reach and Richness: Towards a Theory of Knowledge Sharing Mechanism Selection**
  Lizi Jiang[1], Kah-Hin Chai[1], Wenting Liu[1]
  [1]*National University of Singapore, Singapore*

- **Agent-based Tool To Support Collaborative KMS In Software Maintenance Process Environment**
  Mohd Zali Mohd Nor[1], Rusli Abdullah[1], Mohd Hasan Selamat[1], Masitah Ghazali[1]
  [1]*University Putra Malaysia, Malaysia*

- **Cluster Innovation Capabilities: Concept, Structure and Evolution**
  Jiang Wei[1], Min-fei Zhou[1]
  [1]*Zhejiang University, China*

- **A Preliminary Study on the Current Status of New Product Development in Singapore**
  Han Tong Loh[1], Jie Sun[1], Wen Feng Lu[1], L. S. Nyeow[1]
  [1]*National University of Singapore, Singapore*

- **Modelling the Diffusion of Innovation Management Theory using S-curves**
  Alan Pilkington[1]
  [1]*University of London, United Kingdom*

Technology and Knowledge Management 6

12/10/2008 15:30 - 17:30
Room: Venus 2

Chairs: Sheng-shyr Cheng
Jie Sun

Abstracts: see page 66

- **Matching Niche Strategy and Technology Capability of Latecomer Firms: A Case Study**
  Guoqing Yan[1], Xinmin Peng[2], Ruyan Hong[3], Haibo Zhang[1]
  [1]*Zhejiang Wanli University, China*
  [2]*Zhejiang University, Zhejiang Wanli Universiy, China*
  [3]*Zhejiang University, Hangzhou Normal University, China*

- **The Application of Tools and Techniques in a Unified Service Design Theory**
  Qi Zhou[1], Kay Chuan Tan[1]
  [1]*National University of Singapore, Singapore*

- **Design of Event Driven Digital Right Management by Using Theory of Inventive Problem Solving**
  Song-Kyoo Kim[1]
  [1]*Samsung Electronics Co., Ltd, South Korea*

- **Customers' Knowledge and Personal Attributes in Promoting Demand for Wood Pellet Heating Technologies**
  Aija Tapaninen[1], Marko Seppänen[1]
  [1]*Tampere University of Technology, Finland*

- **Absorptive Capacity Moderates the Relationship between Knowledge Sharing Capability and Innovation Capability**
  Luciana Andrawina[1], Rajesri Govindaraju[1], TMA Ari Samadhi[1], Iman Sudirman[1]
  [1]*Bandung Institute of Technology, Indonesia*

- **Total Innovation Management competence and innovation performance in SMEs -An Empirical Study Based on SME Survey in Zhejiang Province**
  Qingrui Xu[1], Jin Chen[1], Litian Chen[1], Lu Jin[1], Dong Lou[1]
  [1]*Zhejiang University, China*

- **Understanding the Advantages of Open Innovation Practices in Corporate**
  Wim Vanhaverbeke[1], Vareska Van de Vrande[2]
  [1]*Hasselt University, Belgium*
  [2]*Erasmus University, Netherlands*

Decision Analysis and Methods 4

12/10/2008 11:00 - 12:30
Room: Jupiter 1

Chairs: Abbas Toloie Eshlaghy
Min Wang

Abstracts: see page 67

- **Rank Reversal in the PROMETHEE II Method: Some New Results**
  Bertrand Mareschal[1], Yves De Smet[1], Philippe Nemery[1]
  [1]*Université Libre de Bruxelles, Belgium*

- **A Decision Making Approach Based on Fuzzy Regression and Fuzzy Multiple Objective Programming for Advanced Manufacturing Technology Selection**
  Zeynep Sener[1], E. Ertugrul Karsak[1]
  [1]*Galatasaray University, Turkey*

- **Newsvendor Problems with Interval Probabilities**
  Peijun Guo[1], Hideo Tanaka[2]
  [1]*Yokohama National University, Japan*
  [2]*Hiroshima International University, Japan*

- **A Group Decision Making Procedure for Fuzzy Interactive Linear Assignment Programming**
  Mahdi Bashiri[1], Hossein Badri[1]
  [1]*Shahed University, Iran*

- **Conceptual Design for Peristaltic Pump Based on TRIZ**
  Wei Liu[1], Xuan Liu[1], Runhua Tan[1], Guozhong Cao[1]
  [1]*Hebei University of Technology, China*

- **A Mean-Semivariance Model for Stock Portfolio Selection in Fuzzy Random Environment**
  Zhe Zhang[1], Jiuping Xu[1]
  [1]*Sichuan University, China*

Decision Analysis and Methods 5

12/10/2008 13:30 - 15:00
Room: Jupiter 1

Chairs: Yves De Smet
Vahid Ebrahimipour

Abstracts: see page 68

- **Building an Effective ERP Selection System for the Technology Industry**
  Jia-Jane Shuai[1], C. Y. Kao[1]
  [1]*Minghsin University of Science and Technology, Taiwan*

- **R&D Project Portfolio Selection Model Analysis Within Project Interdependencies Context**
  Peng Guo[1], Junjun Liang[1], Yuming Zhu[1], Junfei Hu[1]
  [1]*Northwestern Polytechnical University, China*

- **Applying Fuzzy Linguistic Variable and ELECTRE Method in R&D Project Evaluation and Selection**
  Chen-Tung Chen[1], W. Z. Hung[1]
  [1]*National United University, Taiwan*

- **Using Fuzzy DEMATEL to Develop a Causal and Effect Model of Hot Spring Service Quality Expectation**
  Chih-Cheng Chen[1], Ming-Lang Tseng[1], Yuan-Hsu Lin[1]
  [1]*Ming-Dao University, Taiwan*

- **Facility Location Problem for Reconfigurable Manufacturing System with Multi-period Demand Changing**
  Donghwa Jeong[1], Yoonho Seo[1]
  [1]*Korea University, South Korea*

Project Management 1

12/10/2008 15:30 - 17:30
Room: Jupiter 1

Chairs: C.K. Kwong
Michael Ogembo Kachienga

Abstracts: see page 69

- **Risk Control and Implementation Planning in IS Project**
  Jian Zhang[1], Suling Jia[1], Wenting Liu[2], Qiang Wang[1]
  [1]*Beijing University of Aeronautics and Astronautics, China*
  [2]*National University of Singapore, Singapore*

- **Managing Projects in Global Manufacturing Networks**
  Egon Mueller[1], Ralph Riedel[1], Marc Simon[1]
  [1]*Chemnitz University of Technology, Germany*

- **The Effects of the Debt Financing Restriction in a Real Options Model**
  Michi Nishihara[1], Takashi Shibata[2]
  [1]*Osaka University, Japan*
  [2]*Tokyo Metropolitan University, Japan*

- **An Integrative Approach to Project Management in a Small Team Developing a Complex Product**
  Ronald Beckett[1]
  [1]*University of Western Sydney, Australia*

- **Exploring Impacts of Software Development Process Maturity on Project Risk**
  Chun-Hui Wu[1]
  [1]*National Formosa University, National Yunlin University of Science & Technology, Taiwan*

- **A Fuzzy BOT Project Risk Evaluation Model in Iranian Power Plant Industry**
  Sadoullah Ebrahimnejad[1], S. M. Mousavi[2], S. M. H. Mojtahedi[2]
  [1]*Islamic Azad University Karaj Branch, Iran*
  [2]*Islamic Azad University South Tehran Branch, Iran*

- **Telecommunications Project Management – A Holistic Approach for Operations-Related Services**
  Thomas Frisanco[1], Norbert Anglberger[2], Rachel Ang[3], Stephen Onu[4]
  [1]*Detecon International, Germany*
  [2]*Siemens AG, Germany*
  [3]*Ernst & Young, Germany*
  [4]*Booz Allen Hamilton, United States*

Supply Chain Management 1

12/10/2008 11:00 - 12:30
Room: Jupiter 2

Chairs: Flavio Fogliatto
Thomas Frisanco

Abstracts: see page 70

- **Development of a Methodology to Improve the Source Process**
  Felix Wriggers[1], Philip Fronia[1], Sebastian Beck[1], Peter Nyhuis[1]
  [1]*Leibniz University Hannover, Germany*

- **Analysis of an Inventory Model in Subscription-Based Rental Service with Two-Classes of Customers**
  Aussadavut Dumrongsiri[1], Apurva Jain[2], Kamran Moinzadeh[2]
  [1]*Sirindhorn International Institute of Technology, Thammasat University, Thailand*
  [2]*University of Washington, United States*

- **Inventory Management Performance in Indian Machine Tool SMEs: What Factors Do Influence Them?**
  N. Rajeev[1]
  [1]*Indian Institute of Science, India*

- **A Feed-Back Model of Control Chart for Supplier**
  Jing Sun[1], M. Matsui[1]
  [1]*The University of Electro-Communications, Japan*

- **Optimal Retail Shelf Space Allocation with Dynamic Programming using Bounds**
  Hasmukh Gajjar[1], Gajendra Adil[1]
  [1]*Indian Institute of Technology-Bombay, India*

- **Part Based Decentralized Information Handling for Process Improvements along the Supply Chain**
  Matthias Schmidt[1], Wiebke Hartmann[1], Peter Nyhuis[1]
  [1]*Leibniz University Hannover, Germany*

Supply Chain Management 2

12/10/2008 13:30 - 15:00
Room: Jupiter 2

Chairs: Alireza Haji
Ana Paula Barroso

Abstracts: see page 71

- **Lead Time and Inventory Decisions in a Push-and-Pull System**
  He Xu[1], Xiang Zhu[2], Liming Liu[3]
  [1]*Huazhong University of Science and Technology University, China*
  [2]*Hong Kong University of Science and Technology, Hong Kong*
  [3]*Hong Kong Polytechnic University, Hong Kong*

- **Channel Coordination under Price Protection**
  Zhe Zhang[1]
  [1]*Fudan University, China*

- **Dual Sourcing Strategy in Mass Customized Manufacturing**
  Kristianto Nugroho Yohanes[1]
  [1]*University of Vaasa, Finland*

- **Carbon Market Sensitive Green Supply Chain Network Design**
  Amar Ramudhin[1], Amin Chaabane[1], Mourad Kharoune[1], Marc Paquet[1]
  [1]*École de Technologie Supérieure, Canada*

- **A Model to Quantify the Bullwhip Effect in Systems with Stochastic Demand and Lead Time**
  Jose Carlos Fioriolli[1], Flavio Fogliatto[1]
  [1]*Federal University of Rio Grande do Sul, Brazil*

- **Impact of Channel Power in the Supply Chain Context - An Empirical Study on Taiwan Apparel Industry**
  Chang-Hsien Hsu[1], Yung-Hsin Chen[1], Shuo-Chang Tsai[1], Chi-Yuan Chen[1]
  [1]*Asia University, Taiwan*

Supply Chain Management 3

12/10/2008 15:30 - 17:30
Room: Jupiter 2

Chairs: Yung-Hsin Chen
Sun Jing

Abstracts: see page 72

- **A Multi-Agent Based Combinational Auction Model For Collaborative e-Procurement**
  Shanshan Wang[1], Heqing Song[1]
  [1]*Zhejiang Gongshang University, China*

- **Fuzzy Logic Supply Chain Agility Assessment Methodology**
  Nazanin Pilevari[1], S. M. Seyed Hosseini[1], Javad Jassbi[1]
  [1]*Islamic Azad University Science & Research Branch, Iran*

- **TOPSIS for Solving Multi-Objective Multi-Product Supplier Selection Problem under Price Breaks**
  Omid Jadidi[1], Sai Hong Tang[1], Fatemeh Firouzi[1], Yusof Ismail[1]
  [1]*University Putra Malaysia, Malaysia*

- **A Special Discount Strategy for Supplier Selection and Order Allocation**
  Omid Jadidi[1], Sai Hong Tang[1], Fatemeh Firouzi[1], Rosnah Binti Mohd. Yusuff[1], Yusof Ismail[1]
  [1]*University Putra Malaysia, Malaysia*

- **Green Supply Chain: How Does It Affect Current Supply Chain Practice?**
  Qing Lu[1], Wenkai Li[1], Balan Sundarakani[1], Shun Cai[1], Robert De Souza[1], Mark Goh[1]
  [1]*The Logistics Institute-Asia Pacific, National University of Singapore, Singapore*

- **A Study of Markdown Policy in Aggregate Production Planning Environment by Developing a APP-MP Model**
  William Chung[1], Wenyun Zhu[1]
  [1]*City University of Hong Kong, Hong Kong*

- **A Study for Optimizing the Reading rate of RFID Tagged Cartons in Palletizing Process**
  Chiao Tzu Huang[1], Li-Wen Lo[1], Wei-Ling Wang[1], Hsin-Lin Chen[1]
  [1]*National Chin-Yi University of Technology, Taiwan*

- **A Multi-Sourcing Model from a Cost Heterogeneous Supply Base**
  Jishnu Hazra[1]
  [1]*Indian Institute of Management Bangalore, India*

Facilities Planning and Management

12/10/2008 11:00 - 12:30
Room: Jupiter 3

Chairs: Sydney Chu
Mahadev Talawar

Abstracts: see page 73

- **Location Selection Based on AHP/ANP Approach**
  Chang-Lin Yang[1], Shan-Ping Chuang[2], Rong-Hwa Huang[1], Chia-Chi Tai[1]
  [1]*Fu Jen Catholic University, Taiwan*
  [2]*Huafan University, Taiwan*

- **Fuzzy Multi Criteria Decision Making Method for Temporary Storage Design in Industrial Plants**
  Mojtaba Heydar[1], Reza Tavakkoli-Moghaddam[2], S. M. Mousavi[1], S. M. H. Mojtahedi[1]
  [1]*Islamic Azad University South Tehran Branch, Iran*
  [2]*University of Tehran, Iran*

- **The Fragmented Warehouse: Location Assignment for Unit-load Picking**
  Stephen Ho[1], Sanjay Sarma[1]
  [1]*Massachusetts Institute of Technology, United States*

- **Establishing Work Design Criteria through a Highest Expected Utility Neural Network Model: An Automotive Trim Case Study**
  Rolando Quintana[1], Mark Leung[1]
  [1]*University of Texas at San Antonio, United States*

- **A Mathematical Programming Method for Flow Path Design in High-mix and Low-volume Flow Manufacturing**
  Yunfang Peng[1], Zailin Guan[1], Li Ma[1], Chaoyong Zhang[1], Peigen Li[1]
  [1]*Huazhong University of Science and Technology, China*

- **A Paradigm for Group Technology Cellular Layout Planning in JIT Facility**
  Mark Leung[1], Rolando Quintana[1], An-Sing Chen[2]
  [1]*University of Texas at San Antonio, United States*
  [2]*National Chung Cheng University, Taiwan*

Manufacturing Systems 1

12/10/2008 13:30 - 15:00
Room: Jupiter 3

Chairs: Iraj Mahdavi
Jiafu Tang

Abstracts: see page 74

- **Congruence between Competitive Priorities and Manufacturing Decisions: An Exploratory Study**
  Sanjay Choudhari[1], Gajendra Adil[2], Usha Anantha Kumar[2]
  [1]*National Institute of Construction Management and Research, Indian Institute of Technology-Bombay, India*
  [2]*Indian Institute of Technology-Bombay, India*

- **Lean Manufacturing - a Practitioner's Perspective**
  Sachpreet Singh Aulakh[1], Janpreet Singh Gill[1]
  [1]*RIMT-Institute of Engineering & Technology, India*

- **Managing Product Development Complexities through Restructuring Information Exchange and Adopting Configuration Principle**
  AHM Shamsuzzoha[1], Petri Helo[1], Tauno Kekäle[1]
  [1]*University of Vaasa, Finland*

- **A Multi-plant Tolerance Allocation Model for Assembled Electronic Products**
  Feng-Yi Huang[1], Yuan-Jye Tseng[1]
  [1]*Yuan Ze University, Taiwan*

- **Application of Modular Fixture Elements Library cross Platforms Based on Tabular Layouts of Article Characteristics and XML**
  Jin Cai[1], Guolin Duan[1], Xu Zhang[1], Han Cui[1], Tao Yao[1], Xuebin Chen[1]
  [1]*Hebei University of Technology, China*

- **A Systematic Approach in Shoe Last Design for Human Feet**
  Chung-Shing Wang[1], Teng-Ruey Chang[2], Ming-Ching Lin[1]
  [1]*Tung-Hai University, Taiwan*
  [2]*Nan-Kai University of Technology, Taiwan*

Manufacturing Systems 2

12/10/2008 15:30 - 17:30
Room: Jupiter 3

Chairs: Enrico Vezzetti
Roger Jiao

Abstracts: see page 75

- **ART Based Cell Formation Using Combined Operation Sequence and Time**
  Mohapatra S S[1], S. Sahu[2], SudhakaraPandian R[3]
  [1]*National Institute of Technology, India*
  [2]*Indian Institute of Technology, Kharagpur, India*
  [3]*Kalasalingam University, India*

- **A Genetic Approach to Solving a Hybrid Flow Shop Scheduling Problem**
  Iraj Mahdavi[1], Salim Mojarad[1], Babak Javadi[1], Ali Tajdin[1]
  [1]*Mazandaran University of Science & Technology, Iran*

- **Integrated Quay Crane and Yard Truck Schedule for Inbound Containers**
  Der-Horng Lee[1], Jin Xin Cao[1], Qi Xin Shi[2]
  [1]*National University of Singapore, Singapore*
  [2]*Tsinghua University, China*

- **Solving a New Mathematical Model for Cellular Manufacturing System: Fuzzy goal Programming**
  Mohammad Mahdi Paydar[1], Iraj Mahdavi[2], Maghsud Soleimanpur[3], Ali Tajdin[2]
  [1]*Young Researchers Club, Islamic Azad University, Babol Branch, Iran*
  [2]*Mazandaran University of Science & Technology, Iran*
  [3]*Faculty of Engineering, Urmia University, Iran*

- **Background Analysis for the Application of EOQ Model in a Three-stage Steel Roller Production System with Deterministic Demands and Returns**
  Yang Liu[1], Jiafu Tang[1], Richard Y.K. Fung[2]
  [1]*Northeastern University, China*
  [2]*The City University of Hong Kong, Hong Kong*

- **Cycle Time Reduction in Assembly and Test Manufacturing Factories: a KPI Driven Methodology**
  Li Zheng[1], Jing Xiao[1], Forest Hou[2], Wei Feng[1], Na Li[1]
  [1]*Tsinghua University, China*
  [2]*Intel (Pudong) Corporation, China*

- **Flexible Job Shop Scheduling Problem Solving Based on Genetic Algorithm with Model Constraints**
  Xuan Du[1], Zongbin Li[1], Wei Xiong[1]
  [1]*Xi'an Jiaotong University, China*

- **An Intuitive Framework to Automate Feature-Rich Manual Tasks and Manufacturing Processes**
  Ioannis Georgilas[1], Vassilios Tourassis[1]
  [1]*Democritus University of Thrace, Greece*

Engineering Education and Training

12/10/2008 11:00 - 12:30
Room: Mercury 1

Chairs: Amnon Gonen
Jindong Li

Abstracts: see page 76

- **Social Intelligence in Digital Library Guide Designers**
  Hsing-yu Hou[1], Tung-Hsu Hou[2], Hui-Jiun Hu[2]
  [1]*National Yunlin University of Science and Technology, Taiwan*
  [2]*Transworld Institute of Technology, Taiwan*

- **On-line Training for Improvement of Business Decisions**
  Amnon Gonen[1], Eyal Brill[2], Motti Frank[1]
  [1]*Holon Institute of Technology, Israel*
  [2]*Decision Makers Ltd., Israel*

- **The Experience to Develop Provincial Key Undergraduate Program: Engineering Quality Led Education for Application-oriented Students**
  Jindong Li[1], Jixuan Feng[1], Leela Green[2]
  [1]*Zhejiang Wanli University, China*
  [2]*Stanford University, United States*

- **Relevance of Technical Education For Electrical Technicians Working In Industry/Organization**
  Mahadev Talawar[1], Mahadevi Banad[1]
  [1]*B.V.V.S. Polytechnic, India*

- **Build an Education Resources Allocation Planning Model of School with Integrating Information Technology**
  James K. C. Chen[1], Kevin C. Y. Chen[2], Sin-Yi Lin[2], Benjamin J. C. Yuan[3]
  [1]*Asia University, National Chiao Tung University, Taiwan*
  [2]*Asia University, Taiwan*
  [3]*National Chiao Tung University, Taiwan*

- **Study of M-learning system for Middle School**
  Young C. Park[1]
  [1]*Baekseok University, South Korea*

Safety, Security and Risk Management 1

12/10/2008 13:30 - 15:00
Room: Mercury 1

Chairs: Assed Haddad
Krzysztof Kolowrocki

Abstracts: see page 77

- **Flight Risk Assessment to Airlines Using Bayesian Belief Networks and Fuzzy Comprehensive Evaluation**
  Songbin Ding[1], Yi Ru[1]
  [1]*Civil Aviation University of China, China*

- **Radiology Staff Scheduling Under the Compressed Workweeks**
  Serap Ulusam Seckiner[1], M. B. Önay[1]
  [1]*University of Gaziantep, Turkey*

- **Safety Plan Process for Public Sports Buildings**
  Toni Hyytinen[1]
  [1]*Tampere University of Technology, Finland*

- **An analysis of Project Risks using the Non-parametric Bootstrap Technique**
  Saeid Alborzi[1], A. Aminian[2], S. M. H. Mojtahedi[3], S. M. Mousavi[3]
  [1]*Islamic Azad University Qazvin Branch, Iran*
  [2]*Islamic Azad University Gachsaran Branch, Iran*
  [3]*Islamic Azad University South Tehran Branch, Iran*

- **Occupational Safety in Shared Industrial Workplaces**
  Juha Vasara[1]
  [1]*Tampere University of Technology, Finland*

- **Risks in Decision making - Learning from the Brent Spar Case**
  Mohammad Shahriari[1], Roland Örtengren[1]
  [1]*Chalmers University of Technology, Sweden*

Safety, Security and Risk Management 2

12/10/2008 15:30 - 17:30
Room: Mercury 1

Chairs: Mohammad Shahriari
Tao Liu

Abstracts: see page 78

- **Safety of Railway Control Systems: a New Preliminary Risk Analysis Approach**
  Fateh Guenab[1], Jean-Louis Boulanger[1], Walter Schon[1]
  [1]*Technology University of Compiegne, France*

- **Health, Safety and Environmental Management Risk Evaluation Strategy: Hazard Matrix Application Case Studies**
  Assed Haddad[1], Cláudia Morgado[1], Daniel DeSouza[2]
  [1]*Federal University of Rio de Janeiro, Brazil*
  [2]*North Fluminense State University, Brazil*

- **On a Framework for Strategic and Tactical Risk Management**
  Chengwei Lin[1], Min Xie[1], M. Salahuddin Habibullah[2]
  [1]*National University of Singapore, Singapore*
  [2]*Institute of High Performance Computing, Singapore*

- **Safety Analysis of Ship Technical Systems Related to Variable Operation Conditions**
  Krzysztof Kolowrocki[1], Joanna Soszynska[1]
  [1]*Gdynia Maritime University, Poland*

- **Probabilistic Risk Assessment Framework Development for Nuclear Power Plant**
  Tao Liu[1], Jiejuan Tong[1], Jun Zhao[1]
  [1]*Tsinghua University, China*

- **Systems Engineering Based Model for Risk Assessment: a Case Study**
  Changhua Li[1], Leon Pretorius[2]
  [1]*Hefei University, China*
  [2]*University of Pretoria, South Africa*

- **Collaboration Oriented Approach for Managing Safety and Security Risks in Organizations**
  Marinka Lanne[1], Janne Sarsama[1]
  [1]*VTT Technical Research Centre of Finland, Finland*

- **A General Model of Ship Technical Systems Safety**
  Krzysztof Kolowrocki[1], Joanna Soszynska[1]
  [1]*Gdynia Maritime University, Poland*

Reliability and Maintenance Engineering 4

12/10/2008 11:00 - 12:30
Room: Mercury 2

Chairs: Syed Rizwan
Mayorkinos Papaelias

Abstracts: see page 79

- **Maintenance Performance Assessment (MPA) framework for Engineering Asset**
  Aditya Parida[1]
  [1]*Luleå University of Technology, Sweden*

- **Cost Estimation for Maintenance Contracts for Complex Asset/Equipment**
  Anisur Rahman[1], Gopinath Chattopadhyay[2]
  [1]*Griffith University, Australia*
  [2]*Central Queensland University, Australia*

- **Empirical Bayes Methodology for Estimating Equipment Failure Rates with Application to Power Generation Plants**
  Lesley Walls[1], John Quigley[1], Kenneth Hutchison[2], Mohammad Raza[2]
  [1]*University of Strathclyde, United Kingdom*
  [2]*Alstom Power, Switzerland*

- **Work Force Scheduling for Mixture Policy of Preventive and Corrective Maintenance**
  Sakon Wongmongkolrit[1]
  [1]*Kasetsart University, Thailand*

- **A Combined Self-organizing Map Neural Network with Analysis Graphical Approach for Mixed-weibull Parameter Estimation**
  Pei-Hsi Lee[1], Chau-Chen Torng[1]
  [1]*National Yunlin University of Science and Technology, Taiwan*

- **A Novel Reliable Routing Algorithm for Network on Chips**
  Maryam Raiyat Aliabadi[1], Ahmad Khademzadeh[1], Mohammd Raiyat Aliabadi[2]
  [1]*Iran Telecommunication Research Center, Iran*
  [2]*Malek-e-Ashtar University of Technology, Iran*

Reliability and Maintenance Engineering 5

12/10/2008 13:30 - 15:00
Room: Mercury 2

Chairs: Aditya Parida
Shi-Woei Lin

Abstracts: see page 80

- **Spare Parts Inventory Control for the Maintenance of Productive Plants**
  Maurizio Bevilacqua[1], Filippo Emanuele Ciarapica[1], Giancarlo Giacchetta[1]
  [1]*Università Politecnica delle Marche, Italy*

- **A B-Spline Approach to Alternating Current Field Measurement for Railroad Inspection**
  Mayorkinos Papaelias[1], Fausto Pedro García Márquez[2], Jesus Miguel Chacón Muñoz[2], Clive Roberts[1]
  [1]*The University of Birmingham, United Kingdom*
  [2]*University of Castilla-La Mancha, Spain*

- **A Multi-Objective Optimization Approach for Defining Optimal Design Specifications Considering Performance Degradation**
  Sunil Bhamare[1], Om Prakash Yadav[2], Ajay Pal Singh Rathore[1]
  [1]*Malaviya National Institute of Technology, India*
  [2]*North Dakota State University, United States*

- **A Cure Rate Model in Reliability for Complex System**
  Jing Lin[1], Huiming Zhu[2]
  [1]*SKF China Ltd, China*
  [2]*Hunan University, China*

- **Structure and Dynamics of Distributed Leadership in the Perspective of Social Network Analysis**
  Chunhua Chen[1], Jiefang Li[1], Haibo Wang[2]
  [1]*South China University of Technology, China*
  [2]*Texas A&M International University, Armenia*

- **On Change Point of Mean Residual Life of Parallel Systems**
  Yan Shen[1], Min Xie[1], Loon Ching Tang[1]
  [1]*National University of Singapore, Singapore*

Systems Modeling and Simulation 1

12/10/2008 15:30 - 17:30
Room: Mercury 2

Chairs: Szu Hui Ng
Jae-Yoon Jung

Abstracts: see page 81

- **A Method for FE Simulation of Serrated Chip Formation during High Speed Machining Hardened Steel**
  Chunzheng Duan[1], Yujun Cai[2], Yuanyuan Li[1], Minjie Wang[1]
  [1]*Dalian University of Technology, China*
  [2]*Tianjin Key Laboratory of High Speed Cutting & Precision Machining, University of Technology and Education, China*

- **A Hybrid Simulation Model for Manufacturing Systems Using Event-State-Operation Transitions**
  Dongphyo Hong[1], Yoonho Seo[1]
  [1]*Korea University, South Korea*

- **Development and Analysis of Fuzzy Priority Rules for Scheduling a Dynamic Job Shop Production System**
  Vinod V.[1], R. Sridharan[1]
  [1]*National Institute of Technology Calicut, India*

- **A Hybrid GA-Simulation Approach to Improve JIT Systems**
  Ali Azadeh[1], Vahid Ebrahimipour[1], Parisa Bavar[1], Ehsan Shojaei[2]
  [1]*University of Tehran, Iran*
  [2]*Islamic Azad University Abhar Branch, Iran*

- **Enhancing the Scheduling of Interventional Radiology Department Using Data Analysis and Modeling and Simulation**
  Balagopal Gopakumar[1], Shengyong Wang[1], Mohammad Khasawneh[1], Krishnaswami Srihari[1], Joan Hensberry[2], Davette Cummings[2]
  [1]*State University of New York, Binghamton, United States*
  [2]*Wilson Memorial Regional Medical Center, United States*

- **A MDA Approach for Semi Automatic Grid Services Workflows Composition**
  Yousra BenDaly Hlaoui[1], Leila Jemni BenAyed[1]
  [1]*Research Unit of Technology of Information and Communication Tunis, Tunisia*

- **Re-Engineering Fiber Optic Production Process by Simulation, Design for Assembly Line**
  Wichai Chattinnawat[1]
  [1]*Chiang Mai University, Thailand*

- **Grazing-Sliding Bifurcation Induced by Dry-Friction in a Braking System**
  Fenghong Yang[1], Hongzhi Tong[2], Yun Tang[3]
  [1]*Central University of Finance and Economics, China*
  [2]*University of International Business and Economics, China*
  [3]*Tsinghua University, China*

E-Business and E-Commerce 1

12/10/2008 11:00 - 12:30
Room: Mercury 3

Chairs: Jae-Yoon Jung
Chui Young Yoon

Abstracts: see page 82

- **The Use of E-SQ to Establish the Internet Bank Service Quality Table**
  Yu-Lung Wu[1], Michael C.S Chang[1], Pei-Chi Yang[1], Ying-Jun Chen[1]
  [1]*I-Shou University, Taiwan*

- **Success Factors of E-Learning System Based on Students' Perspectives**
  Su-Sui Lin[1], Kwo-Ting Fang[2]
  [1]*National Yunlin University of Science and Technology, Hsiuping Institute of Technology, Taiwan*
  [2]*National Yunlin University of Science and Technology, Taiwan*

- **An Explore Study of Non-Using Online-Auction People**
  Chwen-Yea Lin[1], Chien-Chung Tu[2], Kwoting Fang[1]
  [1]*National Yunlin University of Science and Technology, Taiwan*
  [2]*Transworld Institute of Technology, Taiwan*

- **Interactive 3D Visualization of Customized Products with Behaviors**
  Tien-lung Sun[1]
  [1]*Yuan-Ze University, Taiwan*

- **Design of the Collaborative Commerce System Model: an Application Issue in Theme Park of China**
  Mu Zhang[1], Yi Chen[2], Junyong Lai[1]
  [1]*Shenzhen Tourism College of Jinan University, China*
  [2]*Shenzhen Happy Valley Corporation, China*

- **Monitoring Usage Behavior in Subscription-based Services Using Control Charts for Multivariate Attribute Characteristics**
  Yaser Samimi[1], Abdollah Aghaie[1]
  [1]*K. N. Toosi University of Technology, Iran*

E-Business and E-Commerce 2

12/10/2008 13:30 - 15:00
Room: Mercury 3

Chairs: Tien-Lung Sun
Raj Siriram

Abstracts: see page 83

- **A Web Services Based Framework for RFID Bike Rental Business Solutions**
  Kuo-shien Huang[1], Shun-ming Tang[1]
  [1]*National Yunlin University of Science and Technology, Taiwan*

- **A New Collaborative Filtering Approach Utilizing Item's Popularity**
  Weiwei Xia[1], Liang He[1], Lei Ren[1], Meihua Chen[1], Junzhong Gu[1]
  [1]*East China Normal University, China*

- **Analysis on the Quantity Effect of Electronic Secondary Market on the Perishable Goods Supply Chain**
  Chu Shan[1], Yaobin Lu[1]
  [1]*Huazhong University of Science and Technology, China*

- **Electronic Procurement Systems: an Integrative Model to Explain Procurement Performance**
  Antonio Aguiar[1], Keshavamurthy Ramamurthy[1], Antonio Reis[2]
  [1]*University of Wisconsin Milwaukee, United States*
  [2]*Technical University of Lisbon, Portugal*

- **Applying Coloured Activity Net to Model Interorganizational Workflow**
  Hong Feng Lai[1], S. G. Chen[2], W.-H. Jeng[3]
  [1]*National United University, Taiwan*
  [2]*Tungnan University, Taiwan*
  [3]*Minghsin University of Science and Technology, Taiwan*

- **Service Integration Toward Ubiquitous Business Process Management**
  Jae-Yoon Jung[1], Jaehyun Kong[2], Jinwoo Park[2]
  [1]*Kyung Hee University, South Korea*
  [2]*Seoul National University, South Korea*

Information Processing and Engineering

12/10/2008 15:30 - 17:30
Room: Mercury 3

Chairs: Yisong(Lydia) Zheng
Michel Aldanondo

Abstracts: see page 84

- **Business Application Integration in the Demand-driven Environment - a Case Study**
  JrJung Lyu[1], Ping-Shun Chen[2]
  [1]*National Cheng Kung University, Taiwan*
  [2]*Chung Yuan Christian University, Taiwan*

- **Data Mining for Managing Stock Keeping Units**
  Shieu-Hong Lin[1]
  [1]*Biola University, United States*

- **Research Into The Driver's Route Choice Under Existing Real-Time Traffic Information**
  Yisong(Lydia) Zheng[1], Qian Wang[1], Ling Wang[2], Mo Kuang[3]
  [1]*Nankai University, China*
  [2]*China University of Political Science and Law, China*
  [3]*Southwest Jiaotong University, China*

- **One-Against-One Fuzzy Support Vector Machine Text Categorization Classifier**
  Huei-Min Chiang[1], Tai-Yue Wang[2]
  [1]*National Cheng Kung University, Nan Jeon Institute of Technology, Taiwan*
  [2]*National Cheng Kung University, Taiwan*

- **Integration of RFID with Mobile Commerce for Consumer Marketing**
  Carman Ka Man Lee[1], Stephen X.J. Chen[1], C.A. Mitrea[1]
  [1]*Nanyang Technological University, Singapore*

- **Component Based Design Data Version Management and Visualization in IMS-DATE**
  Dongliang Cui[1], Guoqi Feng[1]
  [1]*Northeastern University, China*

- **A Closed-loop Engineering Approach for Modular Design Based on Collaboration And Optimization**
  Yanqiu Xiao[1], Qing Xue[1], Aimin Wang[1], Houfang Sun[1], Guoxin Wang[1]
  [1]*Beijing Institute of Technology, China*

Poster Session 2

12/10/2008 10:30 - 11:00, 15:00 - 15:30
Room: Venus 1

Systems Modeling and Simulation 2

12/11/2008 09:00 - 10:30
Room: Venus 2

Chairs: Krishnaswami Srihari
Sridharan R

Abstracts: see page 90

- **Optimizing the Selection of Product Recovery Options**
  Hendrik Lamsali[1], Jiyin Liu[1]
  [1]*Loughborough University, United Kingdom*

- **Evaluating the Layout of the Emergency Department of a Public Hospital Using Computer Simulation Modeling: A Case Study**
  Mohammad Khadem[1], Hamdi Bashir[1], Yasin Al-Lawati[1], Fatma Al-Azri[1]
  [1]*Sultan Qaboos University, Oman*

- **Kriging Model with Modified Nugget Effect for Random Simulation with Heterogeneous Variances**
  Jun Yin[1], Szu Hui Ng[1], Kien Ming Ng[1]
  [1]*National University of Singapore, Singapore*

- **Organisational Readiness and Its Impact on ERP Acquisition: A Longitudinal Study of an Indian Dairy Processing Unit**
  Harekrishna Misra[1]
  [1]*Institute of Rural Management Anand, India*

- **Monsoon Risks for Construction Sites in India**
  Himadri Guha[1], Partha Pratim Biswas[1]
  [1]*Jadavpur University, India*

- **Formulation of the Size and Position of Spiral Cooling Channel in Plastic Injection Mold Based on Fluent Simulation Results**
  Ir Fauzun[1], M. Hamdi[2], A. E. Tontowi[3], T. Ariga[4]
  [1]*University of Malaya, Gadjah Mada University, Malaysia*
  [2]*University of Malaya, Malaysia*
  [3]*Gadjah Mada University, Indonesia*
  [4]*Tokai University, Japan*

Systems Modeling and Simulation 3

12/11/2008 11:00 - 12:30
Room: Venus 2

Chairs: Harekrishna Misra
Szu Hui Ng

Abstracts: see page 91

- **Optimization of Operator Allocation in a Large Multi Product Assembly Shop through Integrated Computer Simulation and Genetic Algorithm**
  Ali Azadeh[1], Vahid Ebrahimipour[1], Sahar Tadayon[1]
  [1]*University of Tehran, Iran*

- **The Impact of Storage Block Assignment for Import Containers on Agv Dispatching in Highly Automated Seaport Container Terminals**
  Rico Gujjula[1], Hans-Otto Günther[1]
  [1]*Berlin Institute of Technology, Germany*

- **Effect of Part Launching Decisions on the Performance of a Flexible Manufacturing System: A Simulation Study**
  O.A. Joseph[1], R. Sridharan[1]
  [1]*National Institute of Technology Calicut, India*

- **Development and Application of a Metaheuristic Optimization Procedure Integrated with Simulation for a Bus Transit System**
  Omar Bataineh[1], Hamzeh Abdulla[1], Ahlam Abu-Saif[1]
  [1]*Jordan University of Science and Technology, Jordan*

- **Performance of a Flexible Manufacturing System Operating Under Part Movement Policy and Tool Movement Policy: Simulation Modelling and Analysis**
  Suresh Kumar N.[1], R. Sridharan[1]
  [1]*National Institute of Technology Calicut, India*

Project Management 2

12/11/2008 09:00 - 10:30
Room: Jupiter 1

Chairs: Ronald Beckett
Volker Grienitz

Abstracts: see page 92

- **Project Management Trends in IS Development: A Study of the IT Sector in China**
  Younes Benslimane[1], Zijiang Yang[1]
  [1]*York University, Canada*

- **A Royalty Negotiation Model for BOT Projects: A Bi-level Programming Approach**
  Chao-Chung Kang[1], Cheng-Min Feng[2], Chiu-Yen Kuo[2]
  [1]*Providence University, Taiwan*
  [2]*National Chiao Tung University, Taiwan*

- **Fuzzy Group Decision Making: A Case Using FTOPSIS in Mega Project Risk Identification and Analysis Concurrently**
  S. M. H. Mojtahedi[1], S. M. Mousavi[1], A. Aminian[2]
  [1]*Islamic Azad University South Tehran Branch, Iran*
  [2]*Islamic Azad University Gachsaran Branch, Iran*

- **An Incremental Approach for Temporal Analysis in Networks with Imprecise Activity and Time Lag Durations**
  Siamak Haji Yakhchali[1], Hassan Ghodsipour[1], S. M. T. Fatemi Ghomi[1]
  [1]*Amirkabir University of Technology, Iran*

- **Hybrid Management Model Combining Process Management and Project Management in Local Administration**
  Manuel Monterrey[1], David de la Fuente[1]
  [1]*University of Oviedo, Spain*

- **Progress in Large-shared Projects: Method for Forecasting and Optimizing Project Duration in a Distributed Project**
  Rameez Khalid[1], Philippe Duquenne[1], Alain Hait[1]
  [1]*Université de Toulouse, France*

Project Management 3

12/11/2008 11:00 - 12:30
Room: Jupiter 1

Chairs: Thomas Frisanco
Ronald Beckett

Abstracts: see page 93

- **Process Management System for the Integration of Situation Dependent Process Planning**
  Wolfgang Lauer[1], Matthias Faerber[2], Julia Roelofsen[1], Florent Jochaud[2], Stefan Jablonski[2], Udo Lindemann[1]
  [1]*Technical University of Munich, Germany*
  [2]*University of Bayreuth, Germany*

- **Correlation Analysis between Maturity Factors and Performance Indexes in Software Project**
  Xiangnan Lu[1], Lang Shu[1], Jie Li[1]
  [1]*Zhejiang University, China*

- **Organizing Project-Based Group Communication Events: A Macro Perspective**
  Chung-Yang Chen[1], Pei-Chi Chen[2], W.L. Tsai[1]
  [1]*National Central University, Taiwan*
  [2]*Trend Micro Incorporated, Taiwan*

- **A Neuro-Fuzzy Approach to generate Customer Satisfaction Model for New Product Development**
  C. K. Kwong[1], T. C. Wong[1]
  [1]*Hong Kong Polytechnic University, Hong Kong*

- **Robust Design for Optimal Project Management with Reliability and Cost**
  Angus Jeang[1]
  [1]*Feng Chia University, Taiwan*

- **Development of Joint Venture Partner Capabilities Assessment Model: The Case of Eskom Enterprises, South Africa**
  Michael Kachienga[1]
  [1]*University of Pretoria, South Africa*

Supply Chain Management 4

12/11/2008 09:00 - 10:30
Room: Jupiter 2

Chairs: Ana Paula Barroso
Adam T.S. Ng

Abstracts: see page 94

- **Integrated Model for Sustainable Development**
  Vineet Varma[1], Gopinath Chattopadhyay[1]
  [1]*Central Queensland University, Australia*

- **RFID-Enabled Aerospace Manufacturing: Theoretical Models, Simulation and Implementation Issues**
  Khir Harun[1], Kai Cheng[1], Marco Wibbelmann[1]
  [1]*Brunel University, United Kingdom*

- **Location-Routing Based Dynamic Vehicle Routing Problem for Express Pick-Up Service**
  Ming-Der May[1], Chan-Yu Tu[1]
  [1]*Lung Hwa University of Science and Technology, Taiwan*

- **Exact Evaluation of a Two Sourcing Supply Chain with Order Splitting and Information Sharing**
  Mehdi Sajadifar[1], Amir Mahdi Hendi[1], Rasoul Haji[2]
  [1]*University of Science and Culture, Iran*
  [2]*Sharif University of Technology, Iran*

- **Realizing Instant Customerization Through Proactively Enhancing Demand Visibility**
  Zhongjun Tang[1], Xiaohong Chen[1], Jing Xiao[1]
  [1]*Central South University, China*

- **A Method of Bottleneck Control in Build-to-order Supply Chain**
  Yimin Xu[1], Shihua Ma[2]
  [1]*Huazhong University of Science and Technology, Guangdong University of Technology, China*
  [2]*Huazhong University of Science and Technology, China*

Supply Chain Management 5

12/11/2008 11:00 - 12:30
Room: Jupiter 2

Chairs: Carman Ka Man Lee
Ming-Der May

Abstracts: see page 95

- **Coordinated Production Planning in Supply Chains**
  Richard Lackes[1]
  [1]*Technische Universität Dortmund, Germany*

- **A Review of Planning and Scheduling in the Pulp and Paper Supply Chain**
  Mohsin Malik[1], Min Qiu[1]
  [1]*University of Western Australia, Australia*

- **The Impact of Uncertain Environment on Rice Supply Chain Performance in Northeast Thailand**
  Phatcharee Thongrattana[1], Peter Robertson[2]
  [1]*Kasetsart University, Thailand*
  [2]*University of Wollongong, Australia*

- **Research on the Subdivision of Transaction Cost in Supply Chain Based on Analysis of Enterprises Relation**
  Xing-hui Lei[1], Ke Zhang[1]
  [1]*Tongji University, China*

- **A Supply Chain Disturbances Classification**
  Ana Paula Barroso[1], Virginia Machado[1], Virgilio Cruz-Machado[1]
  [1]*UNIDEMI, FCT-UNL, Portugal*

- **A Simulation Study on the Impact of Forecasting Methods on the Bullwhip Effect in the Supply Chain**
  S. Kamal Chaharsooghi[1], HamidReza Faramarzi[2], Jafar Heydari[1]
  [1]*Tarbiat Modares University, Iran*
  [2]*Wilfrid Laurier University, Canada*

Global Manufacturing and Management 1

12/11/2008 09:00 - 10:30
Room: Jupiter 3

Chairs: Jiafu Tang
Anil Verma

Abstracts: see page 96

- **Alternative Value Creation Strategies in the Footwear Industry: Exploring the Role of Production Offshoring**
  Antonio Verdu-Jover[1], Jose Maria Gomez-Gras[1], Ignacio Mira-Solves[1], Jesus Martinez-Mateo[1]
  [1]*Miguel Hernandez University, Spain*

- **Evaluating the Performance of Global Telecom Operators**
  Wen-Min Lu[1], Shiu-Wan Hung[2], Chih-Jou Chen[2]
  [1]*National Defense University, Taiwan*
  [2]*National Central University, Taiwan*

- **An Exploration of the Pre-development Phase in New Zealand Small-to-medium Enterprises**
  Warren Baier[1], Aruna Shekar[2]
  [1]*Hansen Products (NZ) Limited, New Zealand*
  [2]*Massey University, New Zealand*

- **Research on Procedures and Model of Flexible Selection of Manufacturing Strategy Competitive Priorities**
  Fengjing Han[1], Chun-sheng Shi[2]
  [1]*Harbin Institute of Technology, Heilongjiang Institute of Science and Technology, China*
  [2]*Harbin Institute of Technology, China*

- **Developing a Feedback Model of Brand Development - A Case in Point of the Laptop Computer Industry in Taiwan**
  Chun-Fu Chen[1], Chin-Huang Lin[2], Hsin-Yun Hu[3]
  [1]*Nanya Institute of Technology, Taiwan*
  [2]*Chung Hua University, Taiwan*
  [3]*Hsin Sheng College of Medical Care and Management, Taiwan*

- **SOCRADES: a Framework for Developing Intelligent Systems in Manufacturing**
  Alessandro Cannata[1], Marco Gerosa[1], Marco Taisch[1]
  [1]*Politecnico di Milano, Italy*

Global Manufacturing and Management 2

12/11/2008 11:00 - 12:30
Room: Jupiter 3

Chairs: Ralph Riedel
Chengter Ho

Abstracts: see page 97

- **Comparative Investigation on Green Supplier Selection of the American, Japanese and Taiwanese Electronics Industry in China**
  Cherng-Ying Chiou[1], Chia-Wei Hsu[2], Wei-Yi Hwang[3]
  [1]*The Overseas Chinese Institute of Technology, Taiwan*
  [2]*National Taipei University of Technology, Taiwan*
  [3]*National Chung Hsing University, Taiwan*

- **Operational Competitiveness Research of Chinese High-Tech International Manufacturing Company in Global Context**
  Shubin Si[1], Josu Takala[2], Yang Liu[2], Rayko Toshev[2], Zhi Tang[2]
  [1]*Northwestern Polytechnical University, China*
  [2]*University of Vaasa, Finland*

- **Partial Chain based GA for Joint Inventory and Delivery Scheduling with Vehicle Rent Way**
  Jiafu Tang[1], Xinggang Luo[1], Jun Zhang[1]
  [1]*Northeastern University, China*

- **Resource-Configurations for Manufacturing Networks: Matching Plant Capabilities to Product Value**
  I-Chen Wang[1]
  [1]*University of Illinois at Urbana-Champaign, United States*

- **Knowledge Sharing for Strengthening Manufacturing Operation and Business Performance**
  Tsu-Te Huang[1], Rodney Stewart[1], Le Chen[1]
  [1]*Griffith University, Australia*

Human Factors 1

12/11/2008 09:00 - 10:30
Room: VIP Room

Chairs: Masahiro Aruga
David de la Fuente

Abstracts: see page 98

- **A Qualitative Study in Consumer Behavior of Skype Internet Phone**
  Chia-Chen Yen[1], Jih-Shih Hsu[1]
  [1]*National Yunlin University of Science and Technology, Taiwan*

- **Research on Cooperative Game Model of Ship Owner and Seafarer**
  Xu Zhao[1], Shuang Zhang[1], Wei Zhang[1], Weihong Zou[1]
  [1]*Dalian Maritime University, China*

- **A Multi Objective Approach for Selecting Solutions to Improve Job Satisfaction - An Empirical Case Analysis**
  Vahid Baradaran[1], Shohreh Ghadami[2], seyyed ehsan malihi[3]
  [1]*Islamic Azad University Tehran North Branch, Iran*
  [2]*Sazeh Gostar Saipa, Iran*
  [3]*Tarbiat Modares University, Iran*

- **Automatic Feature Extraction from Front and Side Images**
  Yueh-Ling Lin[1], Mao-Jiun Wang[1]
  [1]*National Tsing Hua University, Taiwan*

- **Risk Bayesian Assessment Approach to HOF-based Ship Operation in Harbour**
  Shenping Hu[1], Cunqiang Cai[1], Quangen Fang[1]
  [1]*Shanghai Maritime University, China*

- **Japanese Tourists' Perceptions of Shopping at Taiwan Night Markets**
  Chia-Ching Tu[1], Dian Yan Liou[2]
  [1]*National Changhua University of Education, Taiwan*
  [2]*Yu Da College of Business, Taiwan*

Human Factors 2

12/11/2008 11:00 - 12:30
Room: VIP Room

Chairs: Vahid Baradaran
Mohammad Khadem

Abstracts: see page 99

- **An Ergonomics Intervention Study of Reducing Health Complaints among Office Employees**
  Ashraf Shikdar[1], Mohammad Khadem[1], Salim Al-Harthy[1]
  [1]*Sultan Qaboos University, Oman*

- **A Human Factor Fault Tree Analysis Method For Software Engineering**
  Yanyan Zheng[1], Renzuo Xu[1]
  [1]*Wuhan University, China*

- **Rating Consistence of Color Combinations for Aesthetic Preference, Legibility and comfort for Small Icons**
  Shih-Miao Huang[1]
  [1]*National Formosa University, Taiwan*

- **The Consideration of the Partial Differential Equations and the Information Transmitting Structure as the Background of the ABR Derivation and Characteristics**
  Masahiro Aruga[1], Shuichiro Ono[1], Kiyotaka Takagi[1], Tsukasa Sato[1], Shuichi Kato[2]
  [1]*Tokai University, Japan*
  [2]*Teikyo Heisei University, Japan*

- **Ordinal Logistic Regression for Affective Product Design**
  Feng Zhou[1], Du Wu[2], Xi Yang[1], Jianxin(Roger) Jiao[1]
  [1]*Nanyang Technological University, Singapore*
  [2]*Tianjin University, China*

- **Management of Working Shifts Using The Constraint Programming Paradigm**
  David de la Fuente[1], Jesus Lozano[1]
  [1]*University of Oviedo, Spain*

Intelligent Systems

12/11/2008 09:00 - 10:30
Room: Venus 3

Chairs: Carman Ka Man Lee
Iraj Mahdavi

Abstracts: see page 100

- **Ensemble ANN-Based Recognizers to Improve Classification of X-bar Control Chart Patterns**
  Adnan Hassan[1]
  [1]*Universiti Teknologi Malaysia, Malaysia*

- **Prior Training with Jittered Series for Time Series Forecasting**
  Tung-Chen Huang[1]
  [1]*Leader University, Taiwan*

- **Using RFID Technology on Clinic's Pharmacy Operation Management and Development of Intelligent Medicine Dispensing Cabinet**
  Shien Chii Shieh[1], Chang-Ching Lin[2], TaiFu Yang[1], Gu-Han Tu[1]
  [1]*Tung Nan University, Taiwan*
  [2]*St. John's University, Taiwan*

- **Product and Process Configuration : A Constraint Based Approach**
  Michel Aldanondo[1], Elise Vareilles[1], Meriem Djefel[2], Claude Baron[3]
  [1]*University of Toulouse - Mines Albi - CGI, France*
  [2]*University of Toulouse - Mines Albi - CGI, University of Toulouse - LATTIS - INSA, France*
  [3]*University of Toulouse - LATTIS - INSA, France*

- **Control of Robotic Manipulators Via Supervision of the Free Design Parameters and Sampling Rate**
  Manuel de la Sen[1], A. Almansa[1], J. C. Soto[1]
  [1]*Instituto de Investigación y Desarrollo de Procesos, Spain*

- **Reverse Engineering: a Methodology for Supporting Smart Free - Form Digitalization**
  Enrico Vezzetti[1], Antonio Zompì[1]
  [1]*Polytechnic of Turin, Italy*

Quality Control and Management 3

12/11/2008 11:00 - 12:30
Room: Venus 3

Chairs: Lianjie Shu
Wanbo Lu

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- **Study on Weight of the Assessment Criteria for Thailand Quality Award**
  Warapoj Meethom[1], Attakorn Kengpol[2]
  [1]*Mananakorn University of Technology, Thailand*
  [2]*King Mongkut's University of Technology North Bangkok, Thailand*

- **Bayesian Sequential Estimation and Evaluation of Process Capability Indices with Multiple Subsamples**
  Huiming Zhu[1], Keming Yu[2]
  [1]*Hunan University, China*
  [2]*Brunel University, United Kingdom*

- **Statistical Monitoring of Multivariate Linear Profiles**
  Abbas Saghaei[1], Rassoul Noorossana[2], Majid Eyvazian[2], Abolfazl Vaghefi[2]
  [1]*Islamic Azad University, Science and Research Branch, Iran*
  [2]*Iran University of Science and Technology, Iran*

- **Applying Six Sigma Techniques in Plastic Injection Molding Industry**
  Tarek Safwat[1], Aziz Ezzat[2]
  [1]*National Company for Packaging Industries NATPACK, Egypt*
  [2]*Arab Academy for Science and Technology, Egypt*

- **On Evaluating the Measurement Capability of High-quality Processes**
  JrJung Lyu[1], MingNan Chen[1]
  [1]*National Cheng Kung University, Taiwan*

- **Regression-Based Limits for Multivariate Poisson Control Chart**
  Tsen-I Kuo[1], Jing-Er Chiu[2]
  [1]*National Kinmen Institute of Technology, Taiwan*
  [2]*National Yunlin University of Science and Technology, Taiwan*

Poster Session 3

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Room: Venus 1

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Rui Zhu[1], Shijie Dai[1], Yonglu Zhu[1], Xinye Wu[1], Yinbiao Guo[1]
[1]*Xiamen University, China*

p.102 **Hybrid Management in a Hierarchy Organization**
Mani Tousi[1], Esmaeil Mesgarpourtousi[2]
[1]*McGill University, Canada*
[2]*Tehran-Boston Engieers, Iran*

p.102 **Research on Constructing the Framework of Urban Emergency Response System Based on Multi-Agent System**
Xia Wang[1], Chunjing Ge[1], Xianjun Guan[1]
[1]*Tongji University, China*

p.102 **A Coordination-Theory Driven Approach for Manufacturing Web Services Composition Process**
Meng Qian[1], Zhong Liu[1], Li Yao[1], Weiming Zhang[1]
[1]*National University of Defense Technology, China*

p.102 **Optimization of Emergency Logistics Delivery Model Based on Anti-bioterrorism**
Yudong Ke[1], Lindu Zhao[1]
[1]*Southeast University, China*

p.102 **The Study of Factors Impacting on Organizational Innovation in Financial Holding Company**
Chih-Chung Chen[1], Yung-Her Yang[1], Shi-Ting Hsiung[1]
[1]*Aletheia University (Matou campus), Taiwan*

p.102 **Co-creation Value with Customers and Firm's Capabilities**
Xiang Zhang[1], Guoxin Wang[1], JingChang Shangguan[1], Yanqiu Xiao[1]
[1]*Beijing Institute of Technology, China*

p.102 **Knowledge Sharing Behavior, Antecedent and its Influence Towards the Company's Innovation Capability**
Hilmi Aulawi[1], Iman Sudirman[1], Kadarsah Suryadi[1], Rajesri Govindaraju[1]
[1]*Bandung Institute of Technology, Indonesia*

p.103 **Factors and Variables Affecting the Adoption and Practice of Knowledge Management: an Exploratory Study in the Life Insurance Companies in Taiwan**
Ching-huai Peng[1]
[1]*China University of Technology, Taiwan Central University, Taiwan*

p.103 **How an Incubating Network Works? Review and Evidence**
Dechang Lin[1], Zhuoxin Li[1], Hong Yin[1], Qiang Lu[1], Hongwei Wang[2]
[1]*Shenzhen Graduate School, Harbin Institute of Technology, China*
[2]*Zhejiang University, China*

p.103 **Tie Strengths of Interfirm Network, Market Uncertainty, and Innovation: A Case Study**
Xinmin Peng[1], Guoqing Yan[2], Yuan Sun[3], Haibo Zhang[2]
[1]*Zhejiang University, Zhejiang Wanli Universiy, China*
[2]*Zhejiang Wanli University, China*
[3]*Zhejiang University, China*

p.103 **Pleiotrophy Analysis of a Technology System: An Empirical Case of iPod**
Sanna Puha[1], Saku Makinen[1]
[1]*Tampere University of Technology, Finland*

p.103 **Periodic Preventive Maintenance Policy for Finite Horizon with an Adaptive Failure Law**
Jeremie Schutz[1], Nidhal Rezg[1], J. B. Léger[2]
[1]*University of Paul Verlaine, France*
[2]*President of PREDICT, France*

p.103 **On the Supervisory Control of Marked Graphs**
Zied Achour[1], Alexandre Sava[1], Nidhal Rezg[2]
[1]*LGIPM / INRIA, France*
[2]*University of Paul Verlaine, France*

p.103 **Optimal Policy for a Manufacturing System Subjected to Random Failure and Calling Upon Several Subcontractors**
Sofiene Dellagi[1], Nidhal Rezg[2], Ali Gharbi[3]
[1]*Universitry of Metz, France*
[2]*University of Paul Verlaine, France*
[3]*ETS, Canada*

p.103 **Economic Design of Acceptance Control Charts**
Fatemeh Mohammadian[1], Kamran Paynabar[2]
[1]*Azad University North branch of Tehran, Iran*
[2]*Amirkabor University of Technology, Iran*

p.104 **Supporting Decision-making for Secure Resource Sharing between Coworkers Using an Affective-based Trust Evaluation Model**
Tsung-Yi Chen[1]
[1]*Nanhua University, Taiwan*

p.104 **Optimal Construction Sequencing for Secant Pile Wall**
Jieh-Haur Chen[1], Li-Ren Yang[2], Mu-Chun Su[1], Jia-Zheng Lin[1]
[1]*National Central University, Taiwan*
[2]*Tamkang University, Taiwan*

p.104 **Risk Based Maintenance Decision on Power Station High Press Feed Water System**
Yuliang Dong[1], Yujiong Gu[1], Kunliang Chen[1]
[1]*North China Electric Power University, China*

p.104 **Application of the Fuzzy Comprehensive Evaluation Method Based on Entropy Weight and AHP in Maintenance Mode Decision of the Power Plant equipment**
Kun-liang Chen[1], Yu-jiong Gu[1], Kun Yang[1]
[1]*North China Electric Power University, China*

p.104 **Study on Evaluation System for Economic Effectiveness of Safety Resources Based on Data of Accounting**
Enzhu Li[1], Xueyi Zhu[2]
[1]*Shandong University of Finance, China*
[2]*China University of Mining & Technology, China*

p.104 **Economics Analysis on Relations of Safety Cost and International Trade Competition Ability**
Wei Liu[1], Zhenduo Liu[2]
[1]*North China Institute of Science and Technology, Beijing Research for Science of Science, China*
[2]*North China Institute of Science and Technology, China*

p.104 **Study on Multi-agent Based Maintenance Decision Support System Used for Power Plant Equipment**
Yu-jiong Gu[1], Xiao-feng Dong[1], Jian-jun Wu[1], Kun Yang[1]
[1]*North China Electric Power University, China*

p.105 **Testability Demonstration Method of Electronic Equipment Based on Hypergeometric Distribution**
Yanheng Ma[1], Jiuqiang Han[1], Gang Li[2]
[1]*Xi'an Jiaotong University, China*
[2]*Ordnance Engineering College, China*

p.105 **Optimization of Bridge Elements Maintenance Strategy**
Ying-Hua Huang[1], Hsun-Yi Huang[1]
[1]*National Yunlin University of Science and Technology, Taiwan*

p.105 **An Empirical Study on Inexperienced Online Consumer's Window Shopping Behavior: a Trust-cost-behavior Model**
Fue Zeng[1], Hua Zhang[2]
[1]*Wuhan University of China, China*
[2]*City University of Hong Kong, Hong Kong*

p.105 **Formal Semantics for Component Assembly Pattern of Software Architecture**
Wei Guo[1], Sheng Xu[1], Renzuo Xu[1]
[1]*Wuhan University, China*

p.105 **Research of Time-of-Use Electricity Pricing Models in China: A Survey**
Shaolun Zeng[1], Jun Li[2], Yulong Ren[3]
[1]*Chongqing University, Sichuan University of Science & Engineering, China*
[2]*Sichuan University, China*
[3]*Chongqing University, China*

p.105 **Value Estimation for Software Product Management**
Samer Mohamed[1], Ayman Wahba[1]
[1]*Ain Shams University, Egypt*

Abstracts

Session	Technology and Knowledge Management 1
Date	12/9/2008
Time	11:00 - 12:30
Room	Venus 2
Chairs	Kah Hin Chai, Young C. Park

A Small World in the Patent Citation Network
Shiu-Wan Hung[1], An-Pang Wang[1]
[1]*National Central University, Taiwan*

The goal of this report is to characterize the small world phenomenon in the patent citations network by analyzing the data of TFT-LCDs patents. The empirical results suggest that the patent citation network can indeed be characterized as "small world". Additionally, the patent citation network resembles the power-law connectivity distribution and exhibits preferential connectivity behavior. Furthermore, as a patent with high betweenness centrality is removed from the citation network, 50.6% of the patent knowledge communication will be limited. The result of this analysis will provide a specific way for managers to map their own patent networks and derive insight into the best ways to navigate within such networks.

Technological Complexity: a Support to Management Decisions for Product Engineering and Manufacturing
Giovanni Tani[1], Barbara Cimatti[1]
[1]*University of Bologna, Italy*

Complexity is a topical interdisciplinary subject debated in different scientific circles. Complexity is difficult to univocally define as it isn't a physical quantity simple to measure but an abstract concept for which different definitions can be given.
This paper deepens technological complexity applied to engineering and industrial manufacturing, focusing the related aspects that can affect a product and a production system and investigating the different measurement approaches proposed in literature, classifying them into five categories.
Technological complexity is significant in product engineering development, where designers have to consider this aspect to create a functional and reliable product.
Technological complexity measures are important in order to support manufacturing enterprises management in decisions concerning selection of new products to be manufactured and their production. Once a technological complexity level is defined for each product, it is possible to develop feasibility studies in order to check the plant capability to produce it.

Empirically Detecting the Hype Cycle with the Life Cycle Indicators: An Exploratory Analysis of Three Technologies
Heini Jarvenpaa[1], Saku Makinen[1]
[1]*Tampere University of Technology, Finland*

Hype Cycle is a hugely popular graphic representation of the level of maturity, adoption and business application of a technology, originally introduced by Gartner Research's Jackie Fenn. Despite its popularity, the verification or relation to theoretical frameworks is to a large extent missing in current research literature. This paper presents some possible theoretically based conceptualizations and definitions regarding the Hype Cycle. In addition, a bibliometric study of the existence of the Hype Cycle in terms of technology life cycle indicators, specifically in applied research and application phases, was carried out.

Fostering Entrepreneurship through Technical Education for Sustainable Growth of Small and Medium Enterprises in India
Rajesh Jaware[1], V.P. Wani[2], Mukes Kumar Pandey[3]
[1]*Sinhgad Institute of Business Administration & Computer Applications, India*
[2]*National Institute of Technology, Kurukshetra, India*
[3]*Rajiv Gandhi Proudyogiki Vishwavidyalaya, India*

The major challenges that have faced countries seeking to transform from centrally planned into market-based systems is the need to develop micro, small and medium enterprises (MSMEs), as wider process of social and economic restructuring. The development of entrepreneurship amongst engineers will be an effective mechanism of luminous renaissance in technology innovations, to remove the regional imbalance and sustainable growth of MSMEs. An engineer, through self- employment as a career, can bring about a technical revolution to meet the challenges of the emerging economies with competition. Initiatives like ED cells, STEPs, STED, to develop entrepreneurship in the young engineers will be effective in building interaction among entrepreneurs, students, academic experts to inculcate entrepreneurial culture. This paper discusses the strategies for developing entrepreneurial vision amongst engineers, the necessity of the engineer as entrepreneur in the growth of small and medium enterprises.

Likelihood of Acquisition by Private Equity Fund in Semiconductor Packaging Industry
Chengter Ho[1], Hsi-Che Teng[2]
[1]*National Kaohsiung University of Applied Sciences, Taiwan*
[2]*Taiwan IC Packaging Co., Taiwan*

One of the biggest news in Taiwan semiconductor industry between 2006 and 2007 is the proposed acquisition of Advanced Semiconductor Engineering (ASE) by private equity fund. Although the price-to-earnings ratio is probably the most widely known yardstick, Businessweek used a price-to-cash flow ratio as another valuation tool to measure the attractive under-valuated companies. However, among those under-valuated companies, ASE is the only company got the attention of private equity fund. We propose another value model, Enterprise Value and Earnings Before Interest, Taxes, Depreciation and Amortization, to measure the attractiveness of those companies to the private equity fund. This model was used on ASE case first to set the standard. The rest of the companies are also examined by the same model to check the validity of this model.

Research on Conflicts between Task Design and Execution in Knowledge Worker Team under Temporal Framing Effect
Guo Fang Yuan[1], Gang Zhang[1]
[1]*Zhejiang University, China*

Aiming at the conflicts that exist between task design and execution, this paper introduced an important contextual factor: "temporal framing effect" to build a new type of conflict management mechanism for knowledge worker team. A new perspective on conflict management research is provided. By constructing a conceptive theory model: "temporal framing effect—conflict between task design and execution—knowledge worker team performance", this paper developed a new logical thought and theoretical tool for conflict management research in order to pursue effective management patterns in managing conflicts between task design and execution in knowledge worker team.

Session	Technology and Knowledge Management 2
Date	12/9/2008
Time	13:30 - 15:00
Room	Venus 2
Chairs	Chengter Ho, Shieuhong Lin

The Role of Knowledge Sharing and Transactive Memory System on Condition Based Maintenance Policy
Javid Koochaki[1], Inge Bouwhuis[1]
[1]*University of Groningen, Netherlands*

Today, Condition Based Maintenance (CBM) has reached a sophisticated level in industry and the advantages of predictive maintenance are accepted globally. However, although lots of effort has been put into improving methods and techniques in CBM, most of predictive maintenance programs fail to achieve their predefined goals, which make them financially unjustifiable. In this paper, we argue that organizational factors play a crucial role in CBM implementation by their influence on knowledge sharing processes and the organizational Transactive Memory System (TMS). This proposition has been corroborated by means of a case study within an industrial process plant.

KMS Adoption in Organizations
Arman Kaldi[1], Abdollah Aghaie[1], Farid Khoshalhan[1]
[1]*K. N. Toosi University of Technology, Iran*

In order for an organization to fully realize its knowledge management related objectives, it requires a knowledge management system to support it. The organization faces various challenges regarding this system, including whether or not to adopt it, as well as in case of the former, whether users would accept to work with it. Therefore, adoption of knowledge management systems occurs in both organizational level, and individual level. The decision to adopt knowledge management systems for the organization is influenced by many factors, including perceived characteristics of the system, adopter characteristics, firm characteristics, and environmental turbulence. Users' acceptance is also influenced by a number of factors and of course the level of acceptance, in turn, influences the effectiveness of the knowledge management system itself. The influential factors concerning knowledge management systems acceptance can be categorized as individual factors, organizational factors, and system characteristics.

Process-Centered Knowledge Model for Continuous Process Improvement
Kwan Hee Han[1], Jun Woo Park[1], Young Hyo Jo[1]
[1]*Gyeongsang National University, South Korea*

Since knowledge is created and utilized during the execution of business processes, knowledge itself separated from the business process context does not lead to the ability to take the right action towards target performance. Proposed in this paper is the framework of process-centered knowledge model for context-rich knowledge storage and retrieval during the task execution. Enterprise knowledge object of knowledge model is classified into two types: process knowledge and task support knowledge. In the enterprise ontology which represents major enterprise concepts and relationships among them, all domain concepts are related to "process" concept directly and indirectly. To show the applicability of the proposed framework, process-centered KMS was developed which is classified into 3 parts: 1) Project management sub-system based on process knowledge. 2) Knowledge management sub-system for maintaining task support knowledge. 3) Infrastructure sub-system which supports the above two sub-systems.

R&D Resource Allocation and Linkage with Business Strategies-A Technology Lifecycle Perspective
Sheng-Shyr Cheng[1], Hwey-Chyi Lee[1]
[1]*Chang Jung Christian University, Taiwan*

This study modifies Scholefield's (1994) dynamic R&D resource allocation concept and discusses the relationships with business strategies. We substitute original measures with the degree of business leverage (DBL) and the degree of R&D leverage (DRL). These two measures are more useful and objective than those of Scholefield's. In addition, DBL and DRL can combine the concepts of product and technology lifecycle and technology adoption firmly. Managers can use DBL and DRL to help them make optimal R&D resource allocation and business strategy decisions.

An Integrative Framework of Knowledge Management Enabled Supply Chain Management
R. Kant[1], M.D Singh[1]
[1]*Motilal Nehru National Institute of Technology, Allahabad, India*

Supply chain management (SCM) is a cross-functional phenomenon. It creates value to the customers and achieves differential advantages for supply chain (SC) organizations. This paper provides an insight of how knowledge management (KM) affects SCM as well as management of an organization. KM is encouraging individuals for capturing, organizing, and sharing knowledge across the SC organizations. This paper proposes an integrated framework that shows the relationship among the critical success factors (CSFs), KM, knowledge development (KD) and SCM. It further discusses the implications of this framework. This framework provides differential advantages for the SC and its linkages by reducing the costs and investments, and by improving customer services.

A New Approach to Innovation Management in SMEs
Andrew Wait[1], Rainer Seidel[1], Manuel Seidel[1]
[1]*The University of Auckland, New Zealand*

This paper presents a new approach to innovation management in Small and Medium sized Enterprises (SME). The unique Holistic Innovation Framework (HIF) and Value Generation Model (VGM) support and extend the unique New Product Development (NPD) process in SMEs. These processes were found to be primarily dependent on the owner/manager of the SME. The approach externalizes the tacit process of the owner/manager, so that it can be applied by a wider management team. It diverges from existing large organizational NPD theory by taking a capability perspective rather than a project process perspective. The approach was developed using action research in a range of case studies. The application of the approach has identified a range of benefits at an organizational, industry and policy level.

Session	Technology and Knowledge Management 3
Date	12/9/2008
Time	15:30 - 17:30
Room	Venus 2
Chairs	Alan Pilkington, Barbara Cimatti

Performance Analysis for Enterprise Resource Planning Systems
Shin-Guang Chen[1], Yi-Kuei Lin[2]
[1]*Tungnan University, Taiwan*
[2]*National Taiwan University of Science and Technology, Taiwan*

An Enterprise Resource Planning (ERP) system is a complex network composed of various business processes. This paper proposes methods based on stochastic-flow network model to analysis the capacity sensitivity of persons with respect to the performance of an ERP system. The nodes in the network denote the persons responsible for the business tasks during the processes. The arcs between nodes denote the process precedence relationships in the ERP system. The performance of an ERP system is then related to the flow of the documents through the network. To analyze the person's impact against the system performance, the increasing-capacity contributivity analysis and the decreasing-capacity impairment analysis are conducted. Some interesting findings are obtained. For example, the strategy of increasing capacity will not promise to contribute performance. However, the strategy of decreasing capacity will also not always to impair performance. Numerical examples for these analyses are illustrated in this paper.

Innovation Problems Associated with the Dynamic Growth of Chinese University Spin-outs: A Conceptual Framework
Yuan Zhou[1], Charles Hampden-Turner[1]
[1]*University of Cambridge, United Kingdom*

This research aims to develop a capabilities-based framework, in order to study the stage-specific innovation problems associated with the dynamic growth of University Spin-outs (hereafter referred to as USO) in China. Based on existing literature and five pilot cases, this study attempts to explore the innovation problems in search of their entrepreneurial capabilities (e.g. alliances, venture finance, corporate governance, etc) to acquire, mobilize and re-configure key resources at different firm-growth stages. In addition, this study also attempts to generalize the strategic patterns to solve innovation problems for academic entrepreneurs. There is limited research that investigates entrepreneurial innovation problems associated with dynamic growth processes and transitions in order to better explain growth facilitators and obstacles for academic entrepreneurs. Studies that recognize the heterogeneity of USOs (especially in China) in terms of resources and capabilities that may influence growth processes also remain sparse. Addressing this research gap will be of great interest to entrepreneurs, policy makers, and venture investors.

A Tool for Understanding and Measuring End-User e-Business Competency
Chui Young Yoon[1], Keon Myung Lee[1]
[1]*Chungbuk National University, South Korea*

We developed measures for an end-user e-Business competency are developed from major components of general competency. By performing factor analysis and reliability analysis on the developed measurement items through a pilot test, we proposed a 16-item tool that can measure an end-user's e-Business competency in an e-Business environment. We confirmed the successful application of the tool was confirmed by applying it to measuring e-Business competency of end-users in an enterprise with an e-Business environment.

Constructing On-line Knowledge Sharing Model for R&D Staff: an Empirical Study in Taiwan
Chung-Hsiung Fang[1], Chao-Tan Ko[1], Ya-Chin Kang[1], Guan-Li Chen[1]
[1]*National Taiwan Normal University, Taiwan*

The number of enterprises implementing knowledge management (KM) has grown dramatically in recent years. However, few companies could achieve their target and successfully implement KM, especially in Taiwan. There are several factors that need to be considered while developing or implementing knowledge sharing system. This paper is intended to specify factors which effect knowledge sharing as perceived by R&D engineers. The study conducted a questionnaire survey along with literature review. Confirmatory factor modeling approach was used to assess the fitness between the model and data. Based on the results, two conclusions were made as follows. First, Six aspects composed factors affecting one to share knowledge on-line, which were organizational culture, base construction of discussion board, rewards, job stress, knowledge sharing design, and willingness of sharing knowledge. Second, among the six aspects, the factor of knowledge sharing design influenced most, and then organizational culture, rewards, base construction of discussion board, job stress, and willingness of sharing knowledge orderly.

Performance Index and Productivity Analysis for National R&D Funding in Science and Technology
So Young Sohn[1], Jin Young Choi[1]
[1]*Yonsei University, South Korea*

Existing studies on performance analysis of R&D funding have focused only on the object of measurement, and have not considered potential relations among various influential factors. In this paper, we developed performance indices to investigate further at individual company level. Empirical analysis was performed using the performance survey data for the Science and Technology Promotion Fund in Korea. The results of performance analysis could be used to provide the individual companies with insightful feedback information for improving their productivity. We hope this study contribute to better management of national R&D funding.

The Classification of Information Technology on the Perspective of Obtaining Competitive Advantage and Information Technology Capability
Yiming Xiang[1], Yonggang Shu[1]
[1]*Zhejiang Gongshang University, China*

It is not all the IT that can bring the competitive advantage for the enterprises; also it is not all the IT which produces significant influence to the competition that will certainly be able to bring the competitive advantage for the enterprises. To the former, this paper classifies the IT apply on enterprises value chain on the perspective of obtaining competitive advantages, namely, support type ,tool type, function type, flow type and inter-enterprises type, also differentiates their possible influence to competition. To the latter, this paper induces two key policies for enterprises obtaining competitive advantages by applying IT: improving the level of alignment of IT strategy and business strategy, training and applying IT capability.

The Determinants of the Growth of Absorptive Capacity Based on an Open Innovation Perspective: A Case Study
Jin Chen[1], Wangfang Li[2], Wim Vanhaverbeke[3], Zijun Jiang[1]
[1]*Zhejiang University, China*
[2]*Hasselt University, Eindhoven University of Technology, Belgium*
[3]*Hasselt University, Belgium*

Open innovation provides a framework how firms can benefit from external sources of knowledge. Absorptive capacity explains how firms can create and capture value from in-sourcing external knowledge. Therefore, absorptive capacity and open innovation should be linked to each other. In this study, we provide theoretical model and evidence from a case study how innovating firms in rapidly developing economies have to develop absorptive capacity through a combination of exploitation of the existing knowledge base, R&D investments, learning initiatives, and a open innovation network. This model, gives a better understanding how absorptive capacity is developed.

Innovative Strategies for Intelligent Robot Industry in Korea
So Young Sohn[1], Man Jae Kim[1]
[1]*Yonsei University, South Korea*

In the 21st century, the robot is rapidly emerging in the general public. In particular, the intelligent robot will play important roles in the future by strengthening the global competitiveness. In this paper, strategies to improve the utilization of the intelligent robot were investigated using a Structural Equation Model (SEM). The relation among various factors that have a potential influence on robot utilization is explored. According to the results of our study, the current government policies are not effective on revitalization of the robot industry, mainly due to excessive policies implemented simultaneously by the Korean government. However, a Robot Utilization Expectation Index of 75.86 indicates that many people expect a robot as useful in their daily life. These results are expected to contribute to stimulating the robot industry in Korea.

Session	Operations Research 1
Date	12/9/2008
Time	11:00 - 12:30
Room	Jupiter 1
Chairs	Yuri Popkov, Alireza Haji

Mathematical Programming Approach for Routing Home Care Nurses
Bouazza Elbenani[1], Jacques A. Ferland[2], Viviane Gascon[3]
[1]*Université Mohammed V-Agdal, Morocco*
[2]*Université de Montréal, Canada*
[3]*Université du Québec à Trois-Rivières, Canada*

Nowadays more patients need to receive medical treatments at home. Sequencing home care nurses visits shows similarities with the multiple vehicle routing problem with time windows (MVRPTW). Additional constraints make this problem much more complex. These refer to medical requirements and to the importance of continuity of care. In this paper, we present a mathematical model describing the problem of determining routes for home care nurses which takes into account constraints from the MVRPTW along with medical and continuity of care constraints. We also provide some numerical results.

A DSS for Stochastic Multistage Portfolio Optimization in the Mexican Market
Maria A. Osorio[1], Erika Jimenez[1], Abraham Sanchez[1]
[1]*Universidad Autonoma de Puebla, Mexico*

We present the main elements for a decision support system for portfolio management in the Mexican market, including the financial investments consideration for a database, the uncertainty representation in scenario trees and the requirements for a portfolio optimization model. We used a stochastic programming approach to formulate the multistage optimization model, modified with new constraints and solved it with a Simulated Annealing procedure. The scenario tree was generated by a simulation and clustering process. The solution of multiple mean/variance problems is used to build efficient frontiers. Some examples are presented to show the performance of the proposed procedure.

An Improved Numerical Method for Solving a Class of Continuous-time Linear Programming Problems
Ching-Feng Wen[1], Chien-Shih Huang[2]
[1]*Kaohsiung Medical University, Taiwan*
[2]*National Kaohsiung University of Applied Sciences, Taiwan*

In this paper we consider a class of infinite-dimensional linear programming problems, called continuous-time linear programming problems (CLP). In our previous paper [16], we presented a discrete approximation method for solving (CLP) and established the estimation for error bounds of searched numerical solutions. However, the computation times involved can be very large as a result of solving a very large finite-dimensional linear program. We will focus on a special class of (CLP) and provide improved methods to overcome the computational bottleneck.

Fuzzy Multilevel Multiobjective Programming Problems with Fuzzy Domination Structures
Hitoshi Yano[1]
[1]*Nagoya City University, Japan*

In this paper, we focus on fuzzy multilevel multiobjective programming problems with fuzzy domination structures where multiple decision makers in a hierarchical organization have the membership functions for their own objective functions and the corresponding fuzzy domination structures. After introducing decision powers and the solution concept based on the α-level sets for the fuzzy convex cones which reflect fuzzy domination structures in membership space, we propose an interactive fuzzy decision making method to obtain the satisfactory solution which reflects not only the hierarchical relationships between multiple decision makers but also their own preferences for their membership functions. An interactive process is demonstrated by means of an illustrative numerical example.

Analyzing Total Knee Arthroplasty Using Surgical Volume of Different Hospital Levels
Yu-Tien Cheng[1], Ching-Hsue Cheng[1], Jr-Shian Chen[2]
[1]*National Yunlin University of Science and Technology, Taiwan*
[2]*Hungkuang University, Taiwan*

The purpose of this research is to discover valuable medical facts by mining TKA (total knee arthroplasty) surgical volume of three different hospital levels from Taiwan NHI (National Health Insurance) database. In this paper, there are three main objectives provided: (1) to build up the learning curves using the patients' outcomes of three different hospital levels; (2) to characterize whether TKA surgical volume correlates with infection rate and mortality rate; and (3) to examine whether there are differences in the infection rate and mortality rate pair-wise comparisons among medical center, district hospital, and local hospital.
After building up the learning curves, the results of Z-test confirm the differences between these three observed levels. For verification, we've interviewed five specialist surgeons with a semi-structure questionnaire containing some close questions and some open-end, and the investigative results are consistent with the results from data analysis.

A Simple and Effective heuristic for Periodic Vehicle Routing Problem
Ahmad Reza Pourghaderi[1], Reza Tavakkoli-Moghaddam[1], Mehdi Alinaghian[1], Behnam Beheshti-pour[1]
[1]*University of Tehran, Iran*

The periodic vehicle routing problem (PVRP) consists in establishing a planning of visits to clients over a given time horizon so as to satisfy some service level while optimizing the routes used in each time period. A new, simple and effective heuristic algorithm has been developed for the PVRP that is a tour construction type procedure with an embedded improvement procedure. Computational results obtained from the test problems taken from the literature indicate that the algorithm compares well in terms of accuracy and execution time with other existing algorithms, finding a larger number of best solutions.

Session	Operations Research 2
Date	12/9/2008
Time	13:30 - 15:00
Room	Jupiter 1
Chairs	Jacques A. Ferland, Tiefeng Zhang

Data and GP Modeling Framework for Manpower Planning: The Case of Fixed-length Duties
Sydney Chu[1], Minyue Zhu[1]
[1]*University of Hong Kong, Hong Kong*

In the context of manpower planning in general, and with respect to fixed-length shift-duties in particular, Goal Programming (GP) is often useful as an optimization modeling technique for generating shift-duties of worker schedules. A (regular-time) fixed-length duty consists of a fixed number of contiguous hours of work in a day, with a meal/rest break somewhere preferably around the middle of these working hours. It is such properties that enable the straightforward, yet flexible modeling and computation. Such an optimization modeling is built upon the essential foundation of a detailed data modeling and its analysis for all the driving parameters and demand/supply input necessary for numerical computations. Hence data model and GP model form two integral components of this project. Results reported here illustrate the case of baggage service agents planning at the Hong Kong International Airport. Finally, implementation as DSS is briefly described.

Bottleneck Adjacent Matching 3 (BAM3) Heuristic For Re-Entrant Flow Shop With Dominant Machine
Salleh Ahmad Bareduan[1], Sulaiman Hasan[1]
[1]*Universiti Tun Hussein Onn Malaysia, Malaysia*

This paper presents a scheduling heuristic to minimize the makespan of a re-entrant flow shop using bottleneck analysis. The heuristic is specifically intended for the cyber manufacturing centre (CMC) which is an Internet-based collaborative design and manufacturing between the Universiti Tun Hussein Onn Malaysia and the small and medium enterprises. The CMC processes scheduling resembles a four machine permutation re-entrant flow shop with the process routing of M1,M2,M3,M4,M3,M4 in which the first process at M1 has high tendency of exhibiting dominant characteristic. It was shown that using bottleneck-based analysis, an effective constructive heuristic can be developed to solve for near-optimal scheduling sequence. At strong machine dominance level and medium to high job numbers, this heuristic shows slightly better makespan performance compared to the NEH. However, for smaller job numbers, NEH is superior.

Bottleneck Adjacent Matching 4 (BAM4) Heuristic For Re-Entrant Flow Shop With Dominant Machine
Salleh Ahmad Bareduan[1], Sulaiman Hasan[1]
[1]*Universiti Tun Hussein Onn Malaysia, Malaysia*

This paper presents the second version of scheduling heuristic to minimize the makespan of a re-entrant flow shop with dominant characteristic at first process. The processes scheduling resembles a four machine permutation re-entrant flow shop with the process routing of M1,M2,M3,M4,M3,M4 in which the first process at M1 has high tendency of exhibiting dominant characteristic. The BAM4 is developed based on the bottleneck correction factor algorithm introduced to the makespan computation using bottleneck approach. It was shown that using bottleneck-based analysis, an effective constructive heuristic can be developed to solve for near-optimal scheduling sequence. At strong machine dominance level and medium to high job numbers, this heuristic shows slightly better makespan performance compared to the NEH. However, for smaller job numbers, NEH is superior.

An Algorithm for Optimal Cyclic Scheduling in a Robotic Cell with Flexible Processing Times
Pengyu Yan[1], Chengbin Chu[2], Ada Che[3], Naiding Yang[3]
[1]*Northwestern Polytechnical University, Universiteé de Technologie de Troyes, France*
[2]*Universiteé de Technologie de Troyes, France*
[3]*Northwestern Polytechnical University, China*

This paper describes an exact algorithm for the optimal cyclic scheduling in a robotic cell with flexible processing times and a material handling robot. The problem is formulated with the prohibited intervals of the cycle time based on the capacity constraints of the machines and the robot. After the analysis of the developed mathematic model, the problem is transformed to enumerate the non-prohibited intervals for the cycle time. An efficient branch and bound algorithm is proposed to complete this enumeration procedure. Computational results on randomly generated test instances indicate that the algorithm is effective.

A Heuristic Procedure Based on Column Generation to Solve a Cutting Stock Problem
Ya Liu[1], Chengbin Chu[2], Kanliang Wang[3]
[1]*Université de technologie de Troyes, France*
[2]*Université de technologie de Troyes, Xi'an Jiaotong University, France*
[3]*Xi'an Jiaotong University, China*

This paper focuses on a real life cutting stock problem first investigated by Chu and Antonio (1999). In this model, the constraints as well as the objective function are more complex compared with the traditional cutting stock models where some technical parameters are not considered. In this paper, we first apply column generation to this complex cutting stock model. Because of the concavity of the cutting cost with the packet size, the lower bound obtained by column generation is far from reality. This is a new discovery compared with the traditional view: the lower bound obtained by the column generation is tight. To solve the problem, a heuristic procedure is proposed based on this loose lower bound. It is fast and yields the near-optimal solutions. The computational results show that this heuristic procedure based on column generation improves by 10% the performance of the partner company.

Scatter Search for Multi-mode Resource-constrained Project Scheduling Problems
Ahmad Reza Pourghaderi[1], Seyed Ali Torabi[1], Jafar Talebi[1]
[1]*University of Tehran, Iran*

In this paper the multi-mode resource-constrained project scheduling problem is considered. Activities are non-preemptable, resources are renewable, and the objective is to minimize the project duration (or makespan). A local search metaheuristic-scatter search is proposed to solve this strongly NP-hard problem. A comprehensive computational experiment is described, performed on a set of instances based on standard test problems constructed by the proGen project generator. The performance of this scatter search algorithm is compared with the performance of other published algorithms for multi-mode resource-constrained project scheduling problem, the results are analyzed and discussed and some conclusions are given.

Session	Operations Research 3
Date	12/9/2008
Time	15:30 - 17:30
Room	Jupiter 1
Chairs	Sydney Chu, Pengyu Yan

Analysis of the Positive Dynamic Systems with Entropy Operator: Application to Image Restoration from Projections
Yuri Popkov[1]
[1]*Institute for Systems Analysis, Russian Federation*

The PDSEO-concept consists of three parts: the general process in the system is a combination of the slow and fast processes, the slow process is deterministic one and the fast is stochastic one, the fast process is a sequence of the local-stationary states, each of which is described by the entropy operator. The general single-valued entropy operator is considered. For such type of the entropy operator the condi-tions of continuity, smoothness and the estimation of the Lipschitz constant are obtained. The conditions of boundedness of the PDSEO's-trajectories is formulated. These results is used for forming of the dynamic procedure of the entropy image restoration from projections.

Markov Chain with Fuzzy States: Application to Queuing Decision Models
David de la Fuente[1], Maria Jose Pardo[2]
[1]*University of Oviedo, Spain*
[2]*Basque Country University, Spain*

In this paper, we design a queuing system by calculating the best policy to be implemented regarding publicity decisions by using Markov chains with fuzzy states. To this end, first we calculate the steady-state probabilities when the states of the Markov Chain become fuzzy, and next we illustrate by an example the theoretical results previously obtained. In the example, we apply the linear programming solution to the Markovian decision process.

Solving Two Dimensional Layout Optimization Problems with Irregular Shapes by Using Meta-heuristic
Kumaran Ramakrishnan[1], Julia Bennell[1], Mohamed K. Omar[2]
[1]*University of Southampton, United Kingdom*
[2]*Multimedia University, Malaysia*

There are two main approaches popular with researchers to solve two dimensional layout optimization problems that involve irregular shapes, where the objective is to find an arrangement of the irregular pieces in order to minimize waste material. In this paper we have grouped them into iterative constructive heuristics (ICH) and those heuristic which search over the physical layout (SOL). Both approaches are competitive and each new publication brings better results with respect to the benchmark data sets. Although this can be credited to better algorithm design, it could also be argued that researchers are getting better at customizing their algorithms to suit the available benchmark data sets. We intend to investigate these two approaches and establish some principles of the strengths and weaknesses of each approach with respect to data type. The experimental results provide an insight into the desirable solution approach given the variability in input data

Project Scheduling for Maximum NPV with Variable Activity Durations and Uncertain Activity Outcomes
Stefan Creemers[1], Roel Leus[1], Bert De Reyck[2], Marc Lambrecht[1]
[1]*Katholieke Universiteit Leuven, Belgium*
[2]*University College London, United Kingdom*

The literature on project scheduling with uncertain activity durations is still in its burn-in phase. We examine project scheduling with net-present-value objective and exponential activity durations by means of a backward stochastic dynamic programming recursion. We examine the particular setting in which the individual activities carry a risk of failure, and where an activity's failure results in the project's overall failure. In the project planning and scheduling literature, this technological uncertainty has typically been ignored and project plans are developed only for scenarios in which the project succeeds.

Optimal Control with DAE Constraints
Zhihui Yang[1], Wenjuan Cui[1], Yun Tang[2]
[1]*North China University of Technology, China*
[2]*Tsinghua University, China*

In this paper we discuss a kind of optimal control problems with restricted control variables, and the state equations of which are depicted by differential-algebraic equations(DAEs). Through analyzing characters of the optimal control model with DAE constraints, the model can be transformed into a functional extreme value problem. Then by means of the variational principle, we present necessary conditions of optimality for the functional extreme value problems. In addition, a minimum condition of optimality is given based on the necessary conditions. Those theoretical results also provide an analytical way for solving optimal control problems(OCPs). Finally, a well-known chemical engineering model is shown to explain our results.

Assessing the Performance of Distribution Lines Based on Data Envelopment Analysis
Tiefeng Zhang[1], Jinsha Yuan[1], Xiaozhi Li[1]
[1]*North China Electric Power University, China*

This paper proposes a quantificational assessment method to explore the performance of distribution lines based on data envelopment analysis (DEA). In this method the input and output factors are set from the viewpoint of input-output and the utilization efficiency of these distribution lines is calculated and evaluated by DEA, and empirical results are: the utilization efficiency of these distribution lines, the gaps between realism and optimal conditions of inefficient lines, the population distribution of technical efficiency and redundant statistics of input factors. Based on these results, the decision-makers can adopt pertinent measures to improve distribution line situation, meanwhile these results can be used for reference of policy-making in distribution investments and tariff structure.

Developing a Partial Backlogging Deteriorating Inventory Model with Selling Price Dependant Demand Rate and Cycle Length Dependant Selling Price
Alireza Haji[1], Hamed Sabahno[1], Rasoul Haji[1]
[1]*Sharif University of Technology, Iran*

In this paper, we develop an inventory model with price dependant demand rate, under time value of money and inflation, finite time horizon, exponential backlogging rate and exponential deterioration rate with the objective of maximizing the present worth of the total system profit. Using a dynamic programming based solution algorithm, we are able to find the optimal sequence of the cycles and also to obtain different optimal selling prices and optimal order quantities for the cycles with unequal lengths, which have never been done before for our model. We also use a proper numerical example to show accuracy of the solution procedure.

Session	Quality Control and Management 1
Date	12/9/2008
Time	11:00 - 12:30
Room	Jupiter 2
Chairs	Zhang Wu, Rassoul Noorossana

Economic Influences on Customer Satisfaction: Variation by Product Function

Bjoern Frank[1], Takao Enkawa[1]
[1]*Tokyo Institute of Technology, Japan*

Based on longitudinal customer satisfaction data from three durable goods industries in Japan, this study analyzes how economic processes influence customer satisfaction and how these effects vary by product function. Our research hypotheses are based on a conceptual extension of the disconfirmation of expectations theory of customer satisfaction formation. Using principal component and regression analyses, we show that customer satisfaction is positively influenced by economic growth and negatively by economic expectations. These effects, especially the influence of economic expectations, are much stronger for customer satisfaction with peripheral product functions than with core product functions. Quality managers should be aware of misinterpretations when measuring customer satisfaction to evaluate business performance. Variations in customer satisfaction are not only caused by variations in corporate performance but also by external economic influences.

Quality Control of Fan Beam Scanning Data Processing with in Vitro Material

Jan Pieter Clarys[1], Steven Provyn[1], Joanne Wallace[2], Aldo Scafoglieri[1], Thomas Reilly[3]
[1]*Vrije Universiteit Brussel, Belgium*
[2]*Vrije Universiteit Brussel, Liverpool John Moores University, United Kingdom*
[3]*Liverpool John Moores University, United Kingdom*

In vivo assessment of human body composition quantities from imaging/scanning systems in clinical research and public health has led to proliferation of indirect methods and techniques that deliver approximating values. The systems are based on morphological or biochemical models and assumptions. Since the development of Dual-Energy X-Ray Absorptiometry (DXA) for the bone density, mineral content and the detection of osteoporosis, it assesses lean tissue and fat also. This study conducts a quality control of DXA variables using direct dissection of 14 porcine hind legs as the criterion method. Results show good to excellent correlations between DXA and dissection data (r2 =0.75 to 0.99), but absolute indirect DXA and direct dissection values were significantly different (P<0.05). In addition DXA provides erroneous values for bone density and the data dimensions are morphological, not chemical values as claimed by the manufacturer. Validation and accuracy studies with intact whole bodies are advised.

Analysis of Consumers' Requirements for Data/Information Quality by Using HOQ

Keqin Wang[1], Shurong Tong[1], Lionel Roucoules[2], Benoit Eynard[3]
[1]*Northwestern Polytechnical University, China*
[2]*University of Technology of Troyes, France*
[3]*University of Technology of Compiegne, France*

Data/information quality (DQ/IQ) has great impact on data consumers' decisions. In order to provide high quality data/information, data consumers' requirements for DQ/IQ have to be analyzed and identified. Right requirement identification is fundamental to data quality control activities including DQ/IQ measurement, evaluation, improvement, etc. Quality function deployment (QFD) and the house of quality (HOQ) are effective tools to translate consumers' requirements into specific DQ dimensions for DQ improvement. This work briefly introduces QFD, HOQ and their constitutive elements. Data consumers are also examined. A methodology of applying HOQ in DQ/IQ, which includes five major steps, is described in details. Then an example of product design information quality is presented. By using the methodology, the weak points of DQ in industrial firms can be identified in the form of DQ dimensions in order to take actions to improve data/information quality.

An EWMA Control Chart for Monitoring the Mean of Skewed Populations Using Weighted Variance

Michael Boon Chong Khoo[1], Abdu Mohammed Ali Atta[1]
[1]*Universiti Sains Malaysia, Malaysia*

This paper discusses the use of weighted variance (WV) in setting up the limits of the exponentially weighted moving average (EWMA) chart for the monitoring of the mean of a process from a skewed population. This chart, called the WVEWMA chart hereafter, reduces to the standard EWMA chart when the underlying distribution is symmetric. The Type-I and Type-II errors of the WVEWMA chart are compared with that of the existing charts for skewed populations. Simulation results show that the new method gives a considerable improvement over the existing methods when the underlying distribution is skewed.

Dynamic Benchmarking Methodology for Quality Function Deployment

Hendry Raharjo[1], Aarnout Brombacher[2], Kah-Hin Chai[3], Bo Bergman[1]
[1]*Chalmers University of Technology, Sweden*
[2]*Eindhoven University of Technology, Netherlands*
[3]*National University of Singapore, Singapore*

A competitive advantage, generally, can be gained if a firm produces a product that not only addresses what the customer values most, but also performs better than its competitors in terms of quality, cost, and timeliness. However, these two factors, namely, the customer needs and competitors' performance, change over time, and yet most product design processes seem to have oversimplified this fact. This paper aims to address this issue, that is, how the dynamics of these two factors along with their interaction can be integrated into a QFD analysis. This proposed methodology essentially comprises of two novel technical approaches. First, it is the use of an exponential smoothing based forecasting technique to model the trend of the importance rating values and the competitive benchmarking information. Second, it is a strength-weakness-opportunity-threat (SWOT) based competitive weighting scheme, which at the same time serves as a more systematic way to substitute the traditional QFD customer competitive target setting and sales point value determination.

Markov Chain Approximation to the Performance of Adaptive CUSUM Procedures

Lianjie Shu[1], Wei Jiang[2], Zhang Wu[3]
[1]*University of Macau, Macau*
[2]*Stevens Institute of Technology, United States*
[3]*Nanyang Technological University, Singapore*

This paper proposes using a Markovian-type mean estimating procedure in the conventional cumulative sum (CUSUM) control scheme to update its reference value in an adaptive way. This generalizes a class of Markovian adaptive CUSUM (ACUSUM) schemes to achieve the aim of providing an overall good performance over a range of future expected but unknown mean shifts. A comparison of run length performance of the proposed ACUSUM scheme and other control charts is shown favorable to the former.

Session	Quality Control and Management 2
Date	12/9/2008
Time	13:30 - 15:00
Room	Jupiter 2
Chairs	Michael Boon Chong Khoo, Huiming Zhu

Identifying the Time of a Step-change with MEWMA Control Charts by Artificial Neural Network

Farzane Ahmadzade[1], Rassoul Noorossana[2]
[1]*Islamic Azad University of Karaj Branch Graduate School, Iran*
[2]*Iran University of Science and Technology, Iran*

Quality control charts have proven to be very effective in detecting out of control signals. It is very important to practitioners to determine at what point in the past the signal was initiated. If a control chart signals a change in the process parameter, identifying the time of the change will substantially help the signal diagnostics procedure since it simplifies the search for special causes. In this paper the researchers propose the observations following a multivariate normal distribution. They have used Multivariate Exponentially Weighted Moving Average (MEWMA) control chart to detect signals. This research provides two ways to detect the change point, first MLE, and then neural network is used to identify the time of the change in the parameters (mean) in the past. The researchers intended to assess the performance of two approaches and compare them through computer simulation experiments. The results show that neural network performs effectively and equally well for the whole process dimensions while shift magnitudes are considered. Thus, the neural network provides process engineers with an accurate and useful estimate of the actual time of the change in the process mean.

Optimization of Injection Molding Process for Automobile Headlamp Brackets

Li-Chang Chao[1]
[1]*Diwan University, National Chiao Tung University, Taiwan*

This study discusses the variant of weight in injection molding of automobile headlamp brackets. The purpose of this study expects to use the minimum number of experiment to get the optimum combinations of factor-level for injection molding process. This study utilizes the parameter design of quality engineering to carry on the experiment and data analysis. The effect maps of factors are utilized to choice the optimum combination of factor-level. The analysis of variance and confirm experiment are utilized to verify the correction of experiment results. The factors and levels of this study are appropriate if the confidence intervals of quality characteristics that are applied to confirming experiment fall in 95%.

A Theory of Thermal Growth Control Techniques for High Speed Spindles

Ching-Feng Chang[1], Ching-Yi Chao[1], Chao-Shi Ling[2], Jin-Jia Chen[1], Tsair-Rong Chen[1]
[1]*National Changhua University of Education, Taiwan*
[2]*Da Yeh University, Taiwan*

A motorized high speed spindle has very complicated dynamics consisting of non-stationary and speed-related thermal characteristics. Many studies have been reported with different designs to control or monitor spindle's thermal growth with limited results, whereas the application of High Speed Machining (HSM) demands "zero tolerance" no matter the range of speed or material to be machined. This paper proposes a direct displacement measuring system, which is a considerable improvement as compared with many taking inaccurate readings through a traditional thermo coupler, to accurately monitor and compensate the thermal growth associated with motorized high speed spindles. This direct displacement measuring system optimizing a high speed synchronous feedback system will meet the tolerance and performance expected in HSM applications. Based on the introduction of Foucault current, a design for an accurate thermal growth is outlined.

An X-Bar Control Chart Economic Design Sampling Strategy for Non-normally Distributed Data under Gamma (λ, 2) Failure Models

Feng-Chia Li[1], Cho Hua Yeh[2], Peng-Kai Wang[3]
[1]*National Tsinghua University, Taiwan*
[2]*Jen Teh Junior College of Management, Taiwan*
[3]*Hwa Hsia Institute of Technology, Taiwan*

This study compares an x-bar control chart economic design with a variable sampling interval (VSI) and a fixed-length sampling (FSI) for non-normal data under Gamma (λ, 2) shock models. In earlier investigations, constant sampling intervals were widely employed by the control chart's designers and users because of their administrative simplicity. Most control chart economic designs assumed the failure mechanism, which belongs to the Poisson distribution. However, this is not usually pragmatic. Banerjee and Rahim (1993) presented a cost model using VSI under a process-failure mechanism that followed a Gamma (λ, 2) model with an increased hazard rate. These subgroup measurements were assumed to be normally distributed when designing control charts. However, that assumption may not be tenable in this research. Hence, this study employs a numerical example to indicate the solution procedure and to implement the sensitivity analysis while comparing the results of using various sampling interval approaches in non-normally distributed data.

An Adaptive CUSUM Chart with Exponential of Mean Shift

Zhang Wu[1], Mei Yang[1]
[1]*Nanyang Technological University, Singapore*

This article studies a new feature of the ACUSUM chart related to the exponential w of the sample mean shift in (xt – μ0)w. The testing cases reveal that the chart outperforms the earlier ACUSUM chart, works as well as the combined schemes consisting CUSUM and/or charts, but is easier to design and implement. In addition, a general-purpose optimization algorithm is proposed. It can significantly improve the performance of many CUSUM charts over the entire process shift range.

The Effect of Non-normality on the Performance of Linear Profile Monitoring

Rassoul Noorossana[1], Abolfazl Vaghefi[2], Mehdi Dorri[1]
[1]*Islamic Azad University South Tehran Branch, Iran*
[2]*Iran University of Science and Technology, Iran*

Interpretation of quality control charts is usually based on the assumption that successive observations are independent and identically distributed over time. In most statistical process control (SPC) applications, it is assumed that the quality characteristic or vector of quality characteristics of interest follows a univariate or a multivariate normal distribution, respectively. However, in certain cases this assumption may not be realistic. In this paper, we study the effect of non-normality when the quality of a process or product is characterized by a linear profile. Skewed and heavy-tailed symmetric non-normal distributions are used to evaluate the results numerically. The results reveal that non-normality has a significant effect on monitoring linear profile when the process is statistically in-control.

Session	Engineering Economy and Cost Analysis
Date	12/9/2008
Time	15:30 - 17:30
Room	Jupiter 2
Chairs	David de la Fuente, Gyutai Kim

On the Applicability of the Kelly Criterion to Engiineering Economics
Gyutai Kim[1]
[1]*Chosun University, South Korea*

This paper is concerned with studying the potential application of the Kelly criterion to the Engineering Economics world. It is about calculating how much to bet or invest for maximizing the long-term growth rate of the reaped plays of a given game. This criterion has been extensively tested and exploited in the gambling world and used to allocate an optimal amount of the total investment fund to each security to achieve the objective in a financial market. However, based on my extensive survey research, I realized that there was no research done about applying the Kelly criterion in the Engineering Economics world. Therefore, we will show the applicability of the Kelly criterion to the short hypothetical problems of Engineering Economics and briefly to discuss the difficulty in employing it in the Engineering Economics world.

The Influence of Structural Complexity on Product Costs
Stefanie Braun[1], Udo Lindemann[1]
[1]*Technische Universitaet Muenchen, Germany*

A linkage between a product's structural complexity and its costs cannot be denied - even if it is not measurable. This contribution presents an approach developed to analyze the correlation between the structural assembly of mechatronic products and the composition of their development and production costs.
Basic cost-drivers of multidisciplinary products are identified in a field study. On that basis, guidelines for cost-efficient design - as they are well-known for mechanical design - should be deduced for mechatronic product design.
The approach does not focus on specific component features but on the product's overall structural assembly. By the means of DSM analyses these structures are searched for characteristic criteria expected to correlate with characteristics of the cost structure.
The procedure of the analysis and first findings about the correlation of structural criteria in the product and cost structure are presented. On this basis statements for cost-efficient design of mechatronic products can be developed.

Applying Performance Management on Semiconductor Design Processes
Neele Hinrichs[1], Erich Barke[1]
[1]*Leibniz Universität Hannover, Germany*

Measuring performance of business processes is emerging as a significant utility in order to maintain and improve competitive advantages. In this paper the first steps to build up performance measures for semiconductor design processes are presented. An existing framework of a Performance Management System is adapted to the demands of chip design. Furthermore, company-specific and general factors, which have to be considered, are described to define Key Performance Indicators. In times of technological changes and product variety increase it is of particular importance for every semiconductor company to keep up with the shrinking time-to-market windows. Managers have to make the right decisions concerning the workload-manpower mix.

Using Historical Data for Forecasting S-curves at Construction Industry
Mohhammad Taghi Banki[1], Behzad Esmaeeli[1]
[1]*Amirkabir University, Iran*

Cash flow forecasting and control are essential to the survival of any contractor. Therefore, contractors require simpler and quicker techniques which would enable them to forecast cash flow with reasonable accuracy. The paper is based on classifying projects into groups and producing a standard curve for each group simply by fitting one curve into the historical data A sample of data from 7 projects was collected which all of them were harbor construction project in Iran. S-curves were fitted into each using the logit transformation technique. Errors incurred when fitting these curves were measured and compared with those associates in fitting individual projects. Results showed that the difference between these errors was not significant. The results of the model developed in this paper were compared with previous models and evaluated. It is concluded that the model produced more accurate results than existing value and cost models.

Analysis of Software Quality Cost Modeling's Industrial Applicability with Focus on Defect Estimation
Lars Karg[1], Arne Beckhaus[1]
[1]*SAP Research, Germany*

The majority of software quality cost models is by design capable of describing costs retrospectively but relies on defect estimation in order to provide a cost forecast. We identify two major approaches to defect estimation and evaluate them in a large scale industrial software development project with special focus on applicability in quality cost models. Our studies show that neither static models based on code metrics nor dynamic software reliability growth models are suitable for an industrial application.

A Production Economics Model for Predictive Cost Assessment in Manufacturing
Q.Z. Yang[1], R.S. Ng[1], B. Song[1]
[1]*Singapore Institute of Manufacturing Technology, Singapore*

Economic assessment of manufacturing processes evaluates the effects of engineering-economics factors on the current and expected future cost performances in manufacturing. The relationships between those factors are usually specified in production economics models. In this study, a production economics model has been developed to predictively assess the cost effectiveness of liquid forging process. The model consists of the economic relations and influences of engineering parameters, production properties, and economic conditions on manufacturing cost of liquid forged parts. Five critical cost drivers are identified from the liquid forging economics model. The effects of these cost drivers are analyzed through case studies. The proposed model provides a new way to gain insights into the cost behaviors for identifying cost reduction potentials of manufacturing processes.

Digital Technical Documentation Development: Migration of Paper based Support Systems within Submarine Periscope Engineering
Robbie Thomson[1], John Lynn[2]
[1]*Thales Optronics, United Kingdom*
[2]*Glasgow Caledonian University, United Kingdom*

This paper presents the issues and benefits experienced in the migration from a paper based Technical Publications process to a Multimedia interactive DVD based format. The paper aims to present the benefits of using such a format as a future strategy to replace the paper system. It also attempts to address the financial and time gains should such a format be adopted.

Session	Production Planning and Control 1
Date	12/9/2008
Time	11:00 - 12:30
Room	Jupiter 3
Chairs	Hans Otto Guenther, Duy Long Ha

Identification of Implicit Strategies In Production Control
Gunther Reinhart[1], Tobias Gyger[1]
[1]*Technische Universität München, Germany*

In an increasingly turbulent environment, convincing methods of production planning and control are required. Discrete event simulation has proven to be a suitable tool to fulfill this demand. However, as flows of materials are often influenced by ad-hoc decisions of workers, the quality of simulation models depends on the conformance of real-word decision strategies to the ones simulated. This article proposes a method for identifying dynamic workflows caused by decisions of human workers using methods of pattern recognition. For this purpose, underlying data from production data acquisition (PDA) shall be analyzed to identify patterns and to recognize human strategies and provide them for an automated generation of simulation models.

Optimal Balancing of Multi-Objective U-Shaped Assembly Lines using the TSGA Method
Supaporn Suwannarongsri[1], Deacha Puangdownreong[1]
[1]*South-East Asia University, Thailand*

This paper proposes a hybrid intelligent approach to solve such the U-shaped assembly line balancing (UALB) problems. The TSGA method consisting of the tabu search (TS) and the genetic algorithm (GA) is used to identify solutions for the UALB problems. The multiple objectives including the workload variance, the idle time, and the line efficiency, are proposed and set as the objective function of search process. With the proposed approach, the TS can well address the number of tasks assigned for each workstation of the U-shaped line, while the GA can also assign the sequence of tasks for each workstation according to precedence constraints. The proposed approach is tested against three UALB problems from a survey of literature. Obtained results are compared with results obtained from the single-objective approach. As results, the proposed multiple-objective approach based on the TSGA method gives better solutions for all UALB problems.

Multi-Objective Assembly Line Balancing via Adaptive Tabu Search Method with Partial Random Permutation Technique
Supaporn Suwannarongsri[1], Deacha Puangdownreong[1]
[1]*South-East Asia University, Thailand*

This paper proposes a novel intelligent approach for solving the assembly line balancing (ALB) problems. The adaptive tabu search (ATS) method and the partial random permutation (PRP) technique are combined to provide optimal solutions for the ALB problems. In this work, the ATS is used to address the number of tasks assigned for each workstation, while the PRP is conducted to assign the sequence of tasks for each workstation according to precedence constraints. The multiple objectives including the workload variance, the idle time, and the line efficiency, are proposed and set as the objective function. The proposed approach is tested against three benchmark ALB problems and one real-world ALB problem. Obtained results are compared with results obtained from the single-objective approach. As results, the proposed multiple-objective approach based on the ATS and the PRP is capable of producing solutions superior to the single-objective.

Scheduling Incompatible Job Families on A Single Machine: A Two-Level Heuristic Approach
Mohamed K. Omar[1], Yasothei Suppiah[1], Siew Chein Teo[1], Julia Bennell[2]
[1]*Multimedia University, Malaysia*
[2]*University of Southampton, United Kingdom*

We introduce a two-level heuristic approach for solving jobs originated from incompatible job families that aims to minimize the total weighted tardiness. At the first level, an apparent tardiness cost with setups (ATCS) for a single machine is developed. The second level, a Tabu Search (TS) heuristic is developed that uses the initial solution obtained by the ATCS and provides a better solution if it exist. Real industrial data is used to test and validate the proposed methodology. The results indicate that the suggested approach can provide solution in a reasonable good time that can be of use for the decision maker.

Effects of Organizational Innovations on Firm's Production Performance
Gunduz Ulusoy[1], Gurhan Gunday[1], Lutfihak Alpkan[2], Kemal Kilic[1]
[1]*Sabanci University, Turkey*
[2]*Gebze Institute of Technology, Turkey*

In the literature, various papers investigate the effects of the technological (product and process) innovations on firms performance. However, research on the effects of organizational innovations is rare. Furthermore, the performance of the firms is usually measured in terms of financial criteria such as the return on assets or equity and the research on the effects of innovations on production performance is limited. The objective of this paper is to explore the role of different innovation types as well as the organizational innovations on the firm's production performance based on an empirical study covering 184 manufacturing firms in the Northern Marmara region within Turkey. A significant positive relationship between organizational innovations and the firm's production performance is determined.

Case Based Polishing Process Planning with Fuzzy Set Theory
BKK Ngai[1], George Q. Huang[1], Yingfeng Zhang[2], Xin Chen[3], Victor Lo[1]
[1]*The University of Hong Kong, China*
[2]*The University of Hong Kong, Xi'an Jiaotong University, China*
[3]*Guangdong University of Technology, China*

It is difficult to make optimal process planning for polishing product because of the complex processes and the multi-criteria, attributes and vagueness of process parameters. To solve this problem, this paper combines the methodologies of Case Based Reasoning (CBR) and fuzzy Set Theory (FST) to support process planners in planning processes and making decisions effectively for polishing product. Moreover, various mathematical models are designed and integrated to the Web Based Portal System (WBPS) which supports the optimization computation of process parameter settings and case reasoning for polishing product. Finally, some cooker samples from the collaborating company have been collected to demonstrate the effectiveness of Case Based Process Planning (CBPP) model.

Session	Production Planning and Control 2
Date	12/9/2008
Time	13:30 - 15:00
Room	Jupiter 3
Chairs	Adam T.S. Ng, Kenneth Sörensen

A Genetic Algorithm-based Approach to Job Shop Scheduling Problem with Assembly Stage
Felix. T. S. Chan[1], T. C. Wong[2], L. Y. Chan[1]
[1]*University of Hong Kong, Hong Kong*
[2]*Hong Kong Polytechnic University, Hong Kong*

Assembly job shop scheduling problem (AJSSP) is an extension of classical job shop scheduling problem (JSSP). AJSSP first starts with a JSSP and appends an assembly stage after job completion. Lot Streaming (LS) technique is defined as the process of splitting lots into smaller sub-lots so that successive operations of the same lot can be overlapped. In this paper, the research problem is divided into SP1 and SP2. SP1 refers to the determination of LS conditions for all lots and SP2 is the optimization of AJSSP after LS conditions have been determined. To solve the problem, we propose an innovative Genetic Algorithm (GA) approach. To investigate the impacts of LS on AJSSP, several system conditions are examined. To justify the proposed GA, Particle Swarm Optimization (PSO) is the benchmarked method. Computational results suggest that equal size LS is always the best strategy and GA can outperform PSO for all test problems. Some major negative impacts of LS are the increase of work-in-process inventory and total setup cost if the primary objective is the minimization of total lateness cost.

An Approach for Home Load Energy Management Problem in Uncertain Context
Duy Long Ha[1], Minh Hoang Le[1], Stéphane Ploix[1]
[1]*INPGrenoble, France*

This paper focuses on Energy Management problem applied to residential sector. The optimizing procedure of energy management is based on the available prediction (weather prediction, user's habit etc..) which contains the uncertainty and imperfect knowledge. This uncertainty can be modelled as interval model. An approach composing three steps is proposed. Multi-parametric programming is used to calculate the family of a optimal solution. Two examples are proposed to illustrate this approach.

Scheduling on Identical Machines with Batch Arrivals in Semiconductor Testing House
Tsui-Ping Chung[1], Ching-Jong Liao[1], L. H. Su[2]
[1]*National Taiwan University of Science and Technology, Taiwan*
[2]*Chung-Yuan Christian University, Taiwan*

In the scheduling literature, it is often assumed that jobs arrive either simultaneously or individually. However, this assumption is invalid in most practical situations because jobs usually arrive in batches, e.g., the final testing house in the manufacturing of semiconductor. The concept of batch arrivals has been mentioned in some studies, but it has not been explored from an operational viewpoint. This paper first addresses an identical parallel machine problem with batch arrivals to minimize the total completion time. Since the problem is NP-hard, a heuristic based on binary integer program is proposed. Computational results show that the proposed heuristic can efficiently obtain good solutions with an average percentage error of 0.41.

A Heuristic For Parallel Machine Scheduling With Machine Preference For The Electroetching Of Aluminium Foil
Chien-Wen Chao[1], Ming-Chou Chuang[1], Ching-Jong Liao[1]
[1]*National Taiwan University of Science and Technology, Taiwan*

This paper considers a scheduling problem in the manufacturing of anodic electroetching aluminum foil. To reduce cost and increase efficiency, the manufacturer of aluminum foil usually designs the equipment for electroetching of aluminum foil into specialized equipment that is dedicated to produce high voltage or medium voltage aluminum foil based on the range the aluminum foil can bear. Nevertheless, high voltage equipment can be used to produce medium voltage aluminum foil with longer processing time, and vice versa. The problem is to schedule jobs on the high and medium voltage equipment, each having several pieces in parallel, with setup times to minimize to the total completion time. In this paper, we propose a three-stage heuristic for this problem and computationally evaluate the performance of the heuristic relative to the solution obtained using a branch-and-bound algorithm.

Process Sequence Optimization Based on Constraint Matrix
Yujin Hu[1], Zhengyi Zhang[1], Ling Ling[1], Xuelin Wang[1], Weijun Huang[1]
[1]*Huazhong University of Science and Technology, China*

The sequence of manufacturing process should meet process constraints during the Process Planning Optimization. The qualitative constraints are represented implicitly as geometry relationships, process rules and manufacturing environment, it is difficult to apply in the process optimization. A constraint matrix is established to express process constraints; transfer rules and regulation are also designed to ensure the reliability and the veracity when the qualitative constraint message is transferred into matrix. Based on constraint matrix, a process sequence optimization model is set up and Genetic Algorithm is used to obtain the optimal process sequence. An example is presented to indicate that the constraint matrix not only ensure the process optimization's veracity but also enhance the performance efficiency.

Towards a Learning Curve Theory for Batch Production
Anna Chatzimichali[1], Vassilios Tourassis[1]
[1]*Democritus University of Thrace, Greece*

Consumer attitudes and fashion trends often impose severe constraints in manufacturing. When market needs for varied product designs lead to product competition for a place in the production schedule, batch size and available production time are depressed. Due to frequent set-ups and retooling, quality issues arise that hold back the line from a full ramp up. Consequently, the major advantage of quality through learning in mass production is often compromised. In this paper, we stipulate that in batch production the process of industrial learning becomes more complex and thus the archetypal exponential or power curve is not sufficiently rich to describe it. Specifically, we demonstrate that the learning phenomenon appears in double guise: both within and between batches. Actual production data from the fashion-conscious ceramic tile industry provide sufficient support for our premise about the dynamic nature of learning in batch production.

Session	Production Planning and Control 3
Date	12/9/2008
Time	15:30 - 17:30
Room	Jupiter 3
Chairs	George Q. Huang, Kemal Kilic

The Block Planning Approach: a Case Study Application from the Beverage Industry
Hans-Otto Günther[1]
[1]*Berlin Institute of Technology, Germany*

Block planning is a specific concept for the development of production schedules based on the definition of setup families and the production of product variants in a pre-defined sequence. In process industries, e.g. in the pro-duction of beverages, there is often a natural sequence in which the various products are to be produced in order to minimize total changeover time and to maintain product quality standards. In this type of industry, the predominant type of production system is "make-and-pack", i.e. the final bottling and packaging lines determine the output rate of the entire production system. A mixed-integer linear optimiza-tion (MILP) model is proposed that determines the size and the time phasing of the individual production lots while ob-serving capacity constraints of the various production lines and assuring the coverage of daily demand elements.

Human Resource Planning with Worker Attendance Uncertainty
Adam T.S. Ng[1], Huei-Chuen Huang[1], Junyong Ng[1]
[1]*National University of Singapore, Singapore*

We consider a human resource supply planning problem where the staffing levels of different workforce types to fulfill a set of job demands need to be determined, a priori to full knowledge of the attendance rates of the workers. The objective is to find the optimal staffing levels that minimize the hiring costs while maintaining a high certainty of fulfilling all the jobs. We propose six different approaches for generating solutions to the problem. Computational experiments are conducted to evaluate the performance of the approaches. Our experimental results show that two approaches: one based on stochastic programming and the other based on robust optimization using an ellipsoid uncertainty set, outperforms the other approaches consistently in various performance measures.

Integrated Production Planning for the Multiple-machine Sheet Metal Shop with Laser Cutting and Air Bending
Bart Verlinden[1], Kenneth Sorensen[1], Dirk Cattrysse[1], Herman Crauwels[2], Dirk Van Oudheusden[1]
[1]*Katholieke Universiteit Leuven, Belgium*
[2]*Lessius Hogeschool - De Nayer Instituut, Belgium*

To compete with alternative production methods, sheet metal working firms need to improve continuously. Improvement efforts do not solely focus on the production processes, but also on other aspects of the production chain. Production planning is one of those aspects that need to be optimized. The presented research focuses on production planning optimization for sheet metal shops with a cutting stage and a bending stage. The combination of the production plans of the individual processes does not result in a globally optimal production plan. Consequently, both processes need to be integrated for production planning. In this paper, an integer programming formulation is presented for the multiple-machine two-stage sheet metal shop production planning problem. Numerous real-life test cases are used to benchmark the approach against the current way of planning. To limit the computational time, a dedicated variable neighborhood search procedure is presented.

A Two-Stage Method with Mixed Integer Quadratic Programming for Unit Commitment with Ramp Constraints
Ran Quan[1], Jinbao Jian[1], Haiyan Zheng[1], Linfeng Yang[1]
[1]*Guangxi University, China*

A two-stage algorithm based on branch-and-cut is proposed to solve the unit commitment (UC) problem. At first, the primal UC problem is reformulated as a simple mixed integer quadratic programming (MIQP), then the MIQP is solved by the commercial software CPLEX. In stage I of the implementation of the algorithm, a mixed integer linear programming is solved to get its optimal or feasible solution. In stage II, the MIQP is solved starting from the solution obtained in stage I. The computation time of solving MIQP can be saved remarkably with our two-stage method than with the direct method. The simulation results for 6 systems from 10 to 100 units show that the proposed method is efficient for large scale UC problems. Especially, the proposed method can achieve good near-optimal solutions.

Minimization of Weighted Tardiness and Makespan in an Open Shop Environment by a Novel Hybrid Multi-objective Meta-heuristic Method
Reza Tavakkoli-Moghaddam[1], Hadi Panahi[1], Mojtaba Haydar[2]
[1]*University of Tehran, Iran*
[2]*Islamic Azad University South Tehran Branch, Iran*

This paper considers an open shop scheduling problem that minimizes bi-objectives, namely makespan and weighted tardiness. This problem, due to its complexity, is ranked in a class of NP-hard problems. In this case, traditional approaches cannot reach to an optimal solution in a reasonable time. Thus, we propose an efficient meta-heuristic method by hybridizing a multi-objective simulated annealing and ant colony optimization in order to solve the given problem. Two efficient local searches are also designed and applied to improve solution quality. Finally, we compare our computational results with a well-known multiobjective genetic algorithm, namely NSGA II. Comparisons are made in single objective case as well. The outputs show encouraging results in the form of solution quality.

Affection of Transmission Line Limits on Dynamic Behavior
Mu Lin[1], Zhihui Yang[2], Yun Tang[1]
[1]*Tsinghua University, China*
[2]*North China University of Technology, China*

Power plants with much strength may make use of the restriction of circuitry-transmission capacity to increase their market profitability. Based on a three-node network, this paper mainly discusses the influence of the restriction of transmission line limits on the power plants' decision-making. The equilibriums and the limit sets of the iteration process are considered, and the bifurcation figure is given. The analysis is well supported by numerical simulation.

Performance Evaluation of Workflow Scheduling Strategies Considering Transportation Times and Conveyor Failures
Munir Merdan[1], Thomas Moser[1], Dindin Wahyudin[1], Stefan Biffl[1]
[1]*Vienna University of Technology, Austria*

Workflow simulation is an effective approach to investigate dynamic workflow scheduling strategies and evaluate system performance. In this paper we report on a series of performance tests run on our workflow scheduling and quality measurement system. Traditional calculations for workflow scheduling strategies focus only on machine service duration; however, in some contexts the variation of transport time is a significant scheduling factor. In this paper we augment the scheduling calculations to explicitly consider the transportation durations between the machines. In addition, we introduce scenarios with failures of the transport system, e.g., conveyors, which influence the variation of transport durations and evaluate the robustness of workflow scheduling strategies regarding these variations.

Session	Decision Analysis and Methods 1
Date	12/9/2008
Time	11:00 - 12:30
Room	Mercury 1
Chairs	Songlin Chen, Shi-Woei Lin

Multi-criteria Selection of Alternatives for Sustainable Urban Transportation

Orhan Feyzioglu[1], Mehmet Sakir Ersoy[1], Gulcin Buyukozkan[1]
[1]*Galatasaray University, Turkey*

The uncontrolled growth in urbanization and motorization generally contributes to an urban land use and transportation system that is socially, economically, and environmentally unsustainable. Thus a major challenge for transportation policy makers is to identify alternatives that will result in a sustainable transportation system. Various bus technologies are considered in this paper for land transportation and different decision-making groups performed the multiple attribute evaluation of alternative vehicles with sustainability point of view. In our case, an important concern is the dependency of decision criteria, in other words compromise solutions are preferred and unilateral satisfaction of a criterion is not enough. To reflect this situation, Choquet integral based aggregation is proposed and compared with other multi-criteria methods. The results show that criteria dependency is a significant point for the selection of sustainable transportation system.

Comparison of Feature Selection Approaches based on the SVM Classification

Feng-Chia Li[1], Fei-long Chen[1], Gwo-En Wang[2]
[1]*National Tsinghua University, Taiwan*
[2]*Junior Medical College of Jen-Teh, Taiwan*

The credit scoring has been regarded as a critical topic. Creating an effective classificatory model will objectively help managers instead of intuitive experience. This study proposed four strategies combining with the SVM (support vector machine) classifier for features selection that retains sufficient information for classification purpose. Different features preprocessing steps were constructed with four strategies of conventional Linear discriminate analysis (LDA), Decision tree, Rough set and F-score models to optimize feature space by removing both irrelevant and redundant features. The accuracy of four models are compared and nonparametric Wilcoxon signed rank test was held to show the significant difference between these models. Our results suggest that hybrid credit scoring models can mostly classify the applicants as either good or bad clients that are robust and effective in finding optimal subsets and are a promising method to the fields of data mining.

Developing a Fuzzy ANP Model for Selecting the Suitable Dispatching Rule for Scheduling a FMS

Soheil Sadinejhad[1], Hosein Didehkhani[2], S.M. Seyedhosseini[2]
[1]*Industrial Management Institue, Iran*
[2]*Islamic Azad University, Science and Research Branch, Iran*

The scheduling of production in flexible manufacturing systems has been extensively researched over the past years. There are many models such as MODM and heuristics, have been developed by researchers for scheduling a FMS. Scheduling a FMS is a MCDM problem contains many criteria. Also there are many dispatching rules for scheduling. In this paper we develop a model for selecting the best dispatching rule with respect to criteria and system conditions. In most conditions there some inner dependencies among criteria so we cannot use AHP. In this paper we develop an ANP model to consider the inner decencies among criteria. Finally, we apply the proposed model to prove the applicability of the model.

A Fuzzy Group Decision-making Approach to Evaluate a Mobile Technology for Logistics Industry

Gulcin Buyukozkan[1], Jbid Ani Arsenyan[1]
[1]*Galatasaray University, Turkey*

Efficient logistics and supply chain management are enabled through utilization of efficient information technologies. A personal digital assistant (PDA) is a handheld computer that is used for mobile data applications in different industries to improve the effectiveness of the organizations. The objective of this paper is to aid decision makers to identify the most appropriate PDAs especially for logistics companies. To achieve this, several evaluation criteria have been identified and existing leading PDAs have been investigated. An axiomatic design based fuzzy group decision making is adopted to evaluate PDA alternatives. Finally, a case study is given to demonstrate the potential of the methodology.

A Two Phase Fuzzy Decision Making Methodology for Bridge Scheme Selection

S. M. Mousavi[1], Hooman Malekly[2], Hassan Hashemi[3], S. M. H. Mojtahedi[1]
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[3]*Sazeh-Ara Research Center, Member of Young Researchers Club, Iran*

Bridge Scheme Selection (BSS) which includes superstructure types is a complex project engineering that is built up in the present paper. By presenting some novel criteria and considering a fuzzy decision making process, we propose a new hybrid Quality Function Deployment (QFD) for TOPSIS approach and applied to BSS project. At last the best type of scheme is obtained.

An Optimization Framework for Multistage Production-distribution Networks Using Genetic Algorithms

Kim Teng Lai[1], Lee Luong[1], Romeo Marian[1]
[1]*University of South Australia, Australia*

Research in the optimal design of multi-echelon production-distribution networks has been focusing on two-echelon models, which comprise the location-allocation of plants and Distribution Centers subject to specific constraints. Research in two-echelon models could be for two-stage or three-stage optimization model. Currently, almost all the research is in the two-stage model. A three-stage model which integrates DC and plant location-allocation decisions with vendor allocation decisions is, however, a more accurate abstraction of the real world, since the prices and transportation costs of raw materials can vary significantly amongst the vendors, depending on their locations viz-a-viz the plants to be opened. This problem is NP-complete and consists of a large number of variables. This paper provides a solution methodology using genetic algorithm for the optimization of a three-stage, two-echelon, multi-product, capacitated single sourcing production-distribution model.

Session	Decision Analysis and Methods 2
Date	12/9/2008
Time	13:30 - 15:00
Room	Mercury 1
Chairs	Hwey-Chyi Lee, Chih-Cheng Chen

Can Cooke's Model Sift Out Better Experts and Produce Well-Calibrated Aggregated Probabilities?
Shi-Woei Lin[1], Chih-Hsing Cheng[1]
[1]*Yuan Ze University, Taiwan*

In decision and risk analysis, Cooke's classical model is considered one of the most widely used methods for aggregating experts' probability estimates. However, this model's averageprobability scoring rule may enable experts who dishonestly report their quantile estimates to obtain higher scores and, hence, to receive greater weights. In this study, we adopt the leave-one-out cross-validation technique to perform an out-of-sample comparison of Cooke's classical model, the equal-weight linear pooling method, and the best-expert approach. Our results indicate that while the performance of the classical model is much poorer after using an out-of-sample analysis, but Cooke's performance-weight aggregation scheme still significantly outperforms the equal-weight linear pooling method or the best-expert approach. However, the equal-weight approach is more robust than the classical model on the whole.

The Predictive Accuracy of Feed Forward Neural Networks and Multiple Regression in the Case of Heteroscedastic Data
Mukta Paliwal[1], Usha Anantha Kumar[1]
[1]*Indian Institute of Technology-Bombay, India*

During the last few years, several comparative studies for regression analysis and neural networks have been published. Our paper contributes to this stream of research by comparing the performance of feed forward neural network and multiple regression when heteroscedasticity is present in the data. Datasets are simulated that vary systematically on various dimensions like sample size, noise levels and number of independent variables to assess the consequences of deviations from underlying assumptions of homoscedasticity on the comparative performance of regression analysis and neural networks. Comparative analysis is carried out using appropriate experimental design and the results are presented.

Structural Metrics for Decision Points within Multiple-domain Matrices Representing Epc Processes
Matthias Kreimeyer[1], Matthias Gürtler[1], Udo Lindemann[1]
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When reengineering or improving an engineering process, it is important to systematically examine the process for possible weak spots. Complexity metrics, which describe how "complex" a possible part of a process is, are a means of doing so. Using them, every single element of a process (e.g. activities, resources,…) or groups of elements can be reviewed, and those exhibiting distinctive features can be further considered for improvement. Such metrics are especially of interest if no quantitative data is available but only the qualitative process architecture is at hand, e.g. as a process chart. In this paper, different metrics from software and workflow engineering (McCabe Complexity, Control-flow Complexity, Activity / Passivity) are used on a qualitative model of a process incorporating decision points. The process model is based on a Multi-Domain Matrix extended to comprise Boolean operators that are typical for process models (i.e. AND, OR, and XOR).

A Strategic Analysis of Intangible Factors in Technology Investment
Lilian Borges[1], Kim Tan[1]
[1]*Nottingham University, United Kingdom*

Investing in Manufacturing Technologies (MT) is vital to companies' competitiveness. However, many associated pros and cons are intangible by nature, harder to quantify or estimate. Increased flexibility, improved manufacturing control, better working conditions have often been overlooked within the MT justification process. This research proposes a balanced intangible framework and process to MT justification. The aim is to provide a framework to assist managers in identifying and 'quantifying' intangible factors, and a 'balanced' MT justification allowing intangible factors to be incorporated into the decision-making. This paper introduces the proposed framework and process, and describes the preliminary outcomes from an initial case study. Finally, the research implications and directions for future research are discussed.

Using DEMATEL to Explore the Interaction Effect of Team Innovation Factors
Lien-An Hsu[1], Hsu-Feng Hung[2], Ting-Chun Lu[2]
[1]*National Chengchi University, Taiwan*
[2]*National ChengChi University, Taiwan*

As a frequently referenced model for analyzing team innovation, the input-process-output (IPO) model is utilized to distinguish the relations and the levels between critical factors of team innovation. Six critical determinants of team innovation, including team member diversification, team member ability, team member complementary ability, team leadership efficacy, knowledge sharing, and team climate for innovation, were identified in a previous study and used for this study. The relations of these six factors are straightened out by DEMATEL method. The result is helpful for future studies as being a good reference for researchers to construct their relational models of team innovation. Both organization and team leaders can enhance the team innovation though improving the cause factors and control the entire team innovation process through monitoring central factors.

Exploration of Intelligent System in Decision Making - Relationship of Fuzzy Error Logic Decomposition Word T^f and Connotative Antithesis ┼nhdl
Qiwei Guo[1], Qinruo Wang[1], Kaizhong Guo[1]
[1]*Guangdong University of Technology, China*

With the developing of fuzzy systems, more and more advanced control algorithms are being used, in order to make the fuzzy systems more intelligence. Among these advanced control algorithms, the systems always have more or less errors and demerits in them, which will cost the system a lot to reduce. In the worst situation, these errors and demerits can ruin the whole system. The major aim of this paper is to explore the conditions, methods and rules of the fuzzy system errors change or transformation, we mainly discuss the relationship of fuzzy error logic decomposition word T^f and connotative antithesis ┼nhdl. Then, we can get theorems 4.1, 4.2, 4.3, and 4.4, which can be widely used in fuzzy system errors eliminating. By studying this theory, the errors in the fuzzy system can maximally be eliminated.

Session	Decision Analysis and Methods 3
Date	12/9/2008
Time	15:30 - 17:30
Room	Mercury 1
Chairs	Soheil Sadinejad, Yves De Smet

A Model for Evaluating the Performance of the Strategic Plan Using an Analytic Approach

Abbas Toloie Eshlagy[1], R. Radfar[1], M. Bahrampour Kivi[1]
[1]*Islamic Azad University Science & Research Branch, Iran*

Evaluation of the performance of the strategic plans of the organization has been suggested as a tool for controlling the realization of the organizational strategies and goals. In this article, the estimation of the performance has been viewed as a collective decision-making phenomenon, and an estimation model with the gap analysis approach. A hierarchical chart has been used in order to determine the relation among the elements of the strategic programming, and the SMART method has been used in order to determine the weights of the strategies as well as the weights of the observance indices of strategies. In the end, a relation is used which illustrates the relation of the ideal status (the required change) to the predicted status of each index in order to specify the indices with and without priority that should be improved.

A Study of Degrees of Technology Leverage – In-House R&D versus Imported Technology

Hwey-Chyi Lee[1], Sheng-Shyr Cheng[1]
[1]*Chang Jung Christian University, Taiwan*

This study extends the work of Lia, Hsieh, and Chen (2004) and Lee and Cheng (2007) by presenting a theoretical derivation of degree of technology leverage (DTL). DTL is empirically used to examine the performance of technology strategy for to make (in-house R&D) or buy (external technology) decisions for 332 Taiwanese manufacturing and high-tech firms. The empirical results suggest that imported technology may not be riskier than in-house R&D in terms of DTL. Using external technology as a leverage is beneficial in creating economic profits for firms; however, firms need to use other market competitive strategies in combination with their technology strategies to reap the greatest benefit from new technologies.

Formulating a Robust Strategy Using Scenario Programming with a Fuzzy Logic Approach

Reza Radfar[1], A. Toloie Eshlaghy[1], N. Vartanyans[1]
[1]*Islamic Azad University Science & Research Branch, Iran*

Future is unpredictable, but the point is organizations can prepare to encounter it which will result in the creation of competitive advantages. For this situation, organizations should leave their unidimensional view toward the future, and consider the probable events in the future in planning, using a multi-dimensional viewpoint. The methodology of this paper is combines the general method of formulating strategies with the two common tools that are used to fight uncertainty, scenario planning and fuzzy logic. Using the uncertain elements that exist in the environment, this method embarks on designing possible scenarios facing the organization, and with use of fuzzy information, it sets to select the most robust strategy of the organization. In this paper, we compare the common method of strategy formulation with the formulation of strategy through robust methodology, and examine the results from both methods in an organization.

Priority of strategic plans in BSC model by using of Group Decision Making Model

Javad Dodangeh[1], Javad Jassbi[2], Morteza Mousakhani[1], Mohammad Anisseh[3], Rosnah Binti Mohd. Yusuff[4]
[1]*Islamic Azad University Qazvin Branch, Iran*
[2]*Islamic Azad University Science & Research Branch, Iran*
[3]*University Electrical & Computer Research Center, Iran*
[4]*University Putra Malaysia, Malaysia*

Strategic planning is especially important for organization's success and creation of competitive advantage in a competitive and complicated environment, and on the other hand achievement and implementation of strategies can perform an important role for the purpose of organizations' success, balanced scorecard is a new tool for designing operational strategies. One of BSC's problems is the abs use of priority in strategic plans' performance. So, in this article by using proposed model, using the consensus of organization's managers and experts' opinions, measures of four perspectives and general objectives are determined in BSC, and then using experts' opinions and taking the relative importance of decision makers' opinions into consideration , by using Borda method that it is one of Group Decision Making Model , the performances of strategic plans are prioritized in BSC model .
The introduced method is used in a study and extracted results from it are analyzed from different points of view. In this article Initiatives is called strategic plans.

Critical Factors of Team Innovation Ranked by SAW, TOPSIS, and GRA

Lien-An Hsu[1], Hsu-Feng Hung[2], Ting-Chun Lu[2]
[1]*National Chengchi University, Taiwan*
[2]*National ChengChi University, Taiwan*

Sustained innovation is the key to the long-term survival and growth of organization. Exploring determinants of team innovation within organization is thus an important research effort. There are more than 20 determinants of team innovation identified in relevant literatures. The purpose of this study is to rank those proposed determinants by SAW, TOPSIS, and GRA methods, based on opinions of panels of academic and business executives, to recommend a simplified set of critical factors of team innovation. The parsimonious framework of team innovation will be helpful for future researches and promoting team innovation.

Analysis of Brownfield Redevelopment by Evolutionary Game

Yanhua Liang[1], Peng Guo[1], Junfei Hu[1]
[1]*Northwestern Polytechnical University, China*

With the increasing appeal of environmental protection, brownfields have received more and more attendances. The authors analyze the developers' costs and profits of two different strategic choices of project sites and then discuss the interaction of the developers' strategic chooses by evolutionary game. It is concluded that the government's policies and regulations have mutual influence with the strategic choices of the developers' project sites. To promote brownfield redevelopment, the government must take efficient measures to lessen the costs of the brownfield developers.

A Fuzzy Regression Approach To Hierarchical Evaluation Model for Oil Palm Grading

Arbaiy Nureize[1], Junzo Watada[1]
[1]*Waseda University, Japan*

Measurement of quality is an important task in the evaluation of agricultural products. The inspection process is normally pursued on visual inspection basis according to the ripeness standards of the crop, and this grading is subject to expert knowledge and interpretation. Therefore, the quality inspection process of fruits needs to be conducted properly to ensure that good quality fruit bunches are selected for production. Moreover, it needs to be considered during the evaluation that human subjective judgments make the fruit grading inexact. Hence, the objectives of this paper are to build a fuzzy hierarchical evaluation model that characterizes criteria of oil palm fruits, and to decide the fuzzy weights of these criteria based on a fuzzy regression model. A numerical example is included to illustrate the computational process of the proposed model.

Session	Reliability and Maintenance Engineering 1
Date	12/9/2008
Time	11:00 - 12:30
Room	Mercury 2
Chairs	Lesley Walls, Gopinath Chattopadhyay

Optimal Preventive Maintenance for a Device submitted to Random and Deteriorating Failures
Han Bao[1], Deepa Jaishankar[1]
[1]*Old Dominion University, United States*

A Markov model is used to characterize the performance of a continuously operating device that is subject to random failure as well as failure generated by deterioration. The optimum preventive maintenance of this device is determined by maximizing its availability with respect to the mean time to minimal preventive maintenance. An example is provided to illustrate the method. The computational work is performed through Matlab® software. The results indicate that, as deterioration rate decreases, availability increases and total cost of maintenance decreases, but the respective increase/decrease occurs in a non-linear way. On the other hand, as random failure rate decreases the respective increase in availability and decrease in total cost of maintenance occurs in almost a linear way. Thus it is concluded that preventive maintenance is more sensitive to the range of deterioration failure rates than that of random failure rates.

Evaluation of Technical Vs Economic Decisions in Rail Grinding
Venkatarami Reddy[1], Gopinath Chattopadhyay[2], Per-Olof Larsson-Kraik[3], Turgut Allahmanli[1]
[1]*GHD Pty Ltd, Australia*
[2]*Central Queensland University, Australia*
[3]*Swedish National Rail Administration, Sweden*

Rail is a significant capital asset for railway companies. It contributes more than half of the capital assets of railway infrastructure. Recent rail inspection data using Ultrasonic rail testing has shown increasing number of rail defects, failures and causing disruptions to rail services. This cost can be further increased when the track quality is poor. In recent years, railroads have been purchasing over 500,000 tons of rails per year at an estimated total cost of US $1.25 billion for replacement of worn out and degraded rails. Rail grinding is considered as viable means in reducing the impacts of rail defects and failures. Rail grinding can result in improved curving performance (wheel/rail interaction) and prevents crack initiation and propagation of surface cracks due to RCF. This paper focuses on analysis of rail degradation process, development of mathematical models considering technical and economic decisions to rail infrastructure owners.

Optimize a RFID-based Turbine Maintenance Model - a Preliminary Study
JrJung Lyu[1], Tung-Liang Chen[1]
[1]*National Cheng Kung University, Taiwan*

To consolidate the balance of sustained generator and diminished maintenance cost in the power plant is one of the most desired goals of a plant administrator. This goal, in fact, can be fulfilled by a proper turbine maintenance policy. This study presented the use of total productive maintenance and the development of turbine prevention maintenance models can enhance the efficiency of equipments. The probabilistic failure analysis model can determine the maintenance cycle and best maintenance time of turbine by data analysis. In addition, it is shown that applying the radio frequency identification (RFID) in a prevention maintenance operational model could generate cost-saving effectiveness.

Availability Analysis of Rubber Preparation System a Subsystem of a Tube Manufacturing Plant Under Preemptive Resume Priority Repair
Pardeep Gupta[1], A. Jayant[1], A. Goyal[2]
[1]*Sant Longowal Institute of Engineering & Technology, India*
[2]*National Institute of Technology, India*

An availability model of the gradually deteriorating Rubber Preparation System, a part of a cycle rubber tube manufacturing plant is presented in this paper for improving its availability. The methodology for determining the availability of the system under preemptive resume priority repair discipline is based on Markov Modeling. The system undergoes for preventive maintenance (PM) and corrective maintenance (CM) on its transition to degraded and failed states respectively. The effect of repair error in preventive maintenance on most vulnerable items of the system is examined to realize the highest level of performance. The failure and repair rates of the different subcomponents of the system are taken as constant. Probability considerations at various stages of the system give differential equations which are solved using Laplace Transform to obtain the state probabilities. Performance analysis of the system has been carried out which helped in identifying the critical factors and assessing their impact on the system availability.

Stability of a General Repairable Human-Machine System
Houbao Xu[1], Weihua Guo[2], Lina Guo[3]
[1]*Beijing Institute of Technology, China*
[2]*Zhengzhou University of Light Industry, China*
[3]*Beijing Institute of Information and Control, China*

Availability is an important index of repairable human-machine system. Both dynamic availability and steady availability of the system is investigated in this paper. To study the relationship between dynamic and steady availability, an integral-differential mathematical model is constructed. With this model, the paper shows that dynamic availability and steady availability of the system is existent and unique. Furthermore, by the method of functional analysis, the paper shows that the dynamic availability of the system converge the steady availability as time tends to infinity. That is, such repairable human-machine system is asymptotic stability.

Reliability Centered Maintenance for Rolling Stock: A Case Study in Coaches' Wheel sets of Passenger Trains of Iranian Railway
Seyed Mohammad Rezvanizaniani[1], Mahmoud Valibeigloo[1], Mahdi Asghari[1], Javad Barabady[2], Uday Kumar[3]
[1]*RAJA Passenger Trains Co, Iran*
[2]*Tromsø University College, Norway*
[3]*Luleå University of Technology, Sweden*

Historically, most of the maintenance tasks in rolling stock companies are devoted to Preventive Maintenance which leads to some problems such as erroneous maintenance work, unnecessary maintenance tasks, etc. Therefore, it is essential to develop effective maintenance strategies to deal with these problems. While the safety is a significant factor in rolling stock industries, the most well known and widely applied maintenance optimization strategy is so called Reliability Centered Maintenance (RCM). The aim of this paper is to discuss the implementation of RCM to make maintenance of rolling stock of the Raja Passenger Train Corporation more cost effective. Therefore, the paper presents RCM implementation for the wheel sets which is the most critical subsystem from the rolling stocks reliability point of view. Finally, it recommends a modified maintenance plan which is able to improve the maintenance productivity by decreasing downtimes of passenger coaches.

Session	Reliability and Maintenance Engineering 2
Date	12/9/2008
Time	13:30 - 15:00
Room	Mercury 2
Chairs	Venkatarami Reddy, Om Prakash Yadav

A Simple Bayesian Estimation of the Gumbel Distribution
Wanbo Lu[1]
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Practical use of Bayesian estimation of two-parameter Gumbel distribution often requires a two-dimensional joint prior distribution of the Gumbel parameters. It is particularly difficult to convince practitioners to believe any results from their subjective prior distribution. This paper obtains Bayesian estimation of two-parameter Gumbel distribution by using a simple Bayesian estimation procedure proposed by Kaminskiy and Vasiliy [4]. The prior information can be presented in the form of the interval assessment of the reliability function, which is generally easier to obtain. Based on this prior information, the procedure allows constructing the continuous joint prior distribution of Gumbel parameters as well as the posterior estimates of the mean and standard deviation of the estimated reliability function (or the cumulative density function) at any given value of the exposure variable. A numeric example is discussed as an illustration.

Auxiliary Acceleration Factor for Sequential Accelerated Life Tests: A Case Study
Xiao Liu[1], Loon Ching Tang[1]
[1]*National University of Singapore, Singapore*

Accelerated Life Testing (ALT) has been extensively used in manufacturing industry so as to quickly obtain information about product reliability. However, when stress levels are low, failures can still be elusive. To mitigate this problem, a common remedy is to specify a minimum number of failures which may result in long test time and/or excessive extrapolation. In this paper, an auxiliary acceleration factor, with its effect well defined, is adopted to amplify the failure probability at low stress levels. Particularly, it is proposed that an auxiliary stress be applied under a step-stress loading pattern so that the initial stress level will not be too harsh for the product. Based on Weibull failure time and time censoring (type-I) scheme, we demonstrate an approach for embedding an auxiliary acceleration factor into the design of sequential constant-stress ALT through a case study.

Optimal Software Release Policy with Change-Point
Shinji Inoue[1], Shigeru Yamada[1]
[1]*Tottori University, Japan*

Testing-time when a characteristic of a software failure-occurrence or fault-detection phenomenon is observed is ordinarily called change-point. The effect of such phenomenon on software reliability growth process influences on accuracy of the software reliability assessment based on SRGMs which have been developed under the assumption that the stochastic characteristic of the software failure-occurrence or the fault-detection phenomenon is not changed throughout the testing. In this paper, we discuss a framework for software reliability growth modeling with change-point as one of the solutions to incorporate such phenomenon above into software reliability assessment, and also discuss its application to an optimal software release problem with change-point, which would be one of the interesting issues for project management of software development. Finally, we show numerical examples of our model and derived software release policy by using actual data.

Most Reliable Age Replacement Policy; A New Hazard Rate Analyzing Mathematical Model
Mohamad Mahdavi[1], Mojtaba Mahdavi[1]
[1]*Islamic Azad University Najafabad Branch, Iran*

This paper represents a new development on the basic classical age replacement policy, heuristically using the reliability function. First, an applied mathematical model of reliability function is obtained, and then based on this model; optimal preventive age replacement policy will be determined to maximize the reliability of the system. For the special systems which meet exponential density function with constant hazard function, a different simple decision making model will be proposed to choose optimal replacement policy based on the reliability function. A real case study will be reviewed on the maintenance data collection of two different industrial machines that one of them meets the Weibull density and other one has Exponential density function as life time pattern.

Reliability and Availability of a Continuous Casting Plant
Syed Rizwan[1], A G Mathew[1], Manik Majumder[2], K P Ramchandran[1]
[1]*Caledonian (University) College of Engineering, Oman*
[2]*NIT Durgapur, India*

The continuous casting (CC) technique accounts for more than 60% of total liquid steel in the world. The main advantages of steel processing through the CC route are higher yield, lower energy consumption, elimination of primary mills. Since the CC plant is an integral part of most steel plants, therefore, the need for failure analysis of such a system wherein a CC plant is operating round the clock. The real data of a CC plant for four equipments viz. ladle handling crane 01, 02 and billet handling crane 01, 02 have been used for the purpose. Any one equipment failure brings the CC plant to a complete halt and stops the production. The critical equipment fails due to any one of the five types of failure as categorized in the data. The paper outlines the modeling strategy embedded by the types of failures actually depicted in the data and important reliability indices such as the mean time to system failure and steady state availability are obtained using semi-Markov processes and regenerative point techniques. Graphs are essentially established to interpret the results.

Session	Reliability and Maintenance Engineering 3
Date	12/9/2008
Time	15:30 - 17:30
Room	Mercury 2
Chairs	Pardeep Gupta, Shinji Inoue

A Function Failure Analysis Method for Improving Reliability of the Product Based on Go-flow Methodology
Zhonghang Bai[1], Xiangdong Li[1], Runhua Tan[1], Benning Lian[1]
[1]*Hebei University of Technology, China*

Reliability and quality of product is not established completely in detail design process, but is brought out essentially in the course of conceptual design. Flow and operation are the two basic element of function structure network. The failures of flow and operation will transfers in function structure network. Failure analysis is an important technology in product reliability and quality's guarantee. Anticipatory flow failures and anticipatory operation failures are determined by analysing function structure of product. Probability of function failure, sensitivity of function failure, arithmetic mean of failure probability and standard deviation of failure probability are gained by the function failure analysis of the function structures using the GO-FLOW methodology. A function failure analysis method for improving reliability of the product in the stage of conceptual design is introduced in this paper. This method introduces reliability design to conceptual design of product, even the functional design, so reliability and quality of product can be improved effective in the top of product design.

The Technical Reliability of Electrical Power Objects in the Formulation of Management Accountancy
Grazyna Dabrowska-Kauf[1]
[1]*Wroclaw University of Technology, Poland*

This article conducts an identification of the relationship between technical reliability of electrical objects and management accountancy, with regard in particular this characterizing the economics of enterprises in the electrical sector, in which the given electrical object is exploited and is and fix asset. The cause effect relationship, which manifests itself between the reliability of technical object and economic activity of enterprise manageress enables management this analyze technical issues in the aspect of financial results of enterprise. They example of such and decision, relating this the purchase of electrical object offered he market in different prices and different profiles of technical reliability, it will become apparent, that they should create criteria linking technical - economical aspects, using tools from two fields: reliability and management accountancy.

Challenges of Asset Management in Power Transmission Network
Lutfiye Allahmanli[1], Gopinath Chattopadhyay[1], Gary Edwards[2]
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[2]*Powerlink Queensland, Australia*

Managing Assets in capital intensive industries such as Power Transmission has been becoming more complex due to uncertainties with long asset life, inspection and maintenance in remote places, environmental factors, statutory requirements along with deregulation and competition in the open market. In this paper, the possible challenges are explained with illustrative examples. Asset management principals for power transmission network companies are emphasized. The hierarchal levels within asset management approach are shown with highlighting the importance of relationship between each level.

A PCA-GA Approach for Weighted Voting System Optimization Based on Reliability, Cost and System Output Analyses
Vahid Ebrahimipour[1], Ali Azadeh[1], Shahrzad Faghih Roohi[1], Ehsan Shojaei[2], Amin Aalaei[3]
[1]*University of Tehran, Iran*
[2]*Islamic Azad University Abhar Branch, Iran*
[3]*Mazandaran University of Science and Technology, Iran*

The objective of this paper is to present a model for optimization of Weighted Voting Systems (WVS). To achieve this objective, a comprehensive study was conducted to recognize economic and technical indicators (indices) which have great influences upon system performance. These indicators are related to components' reliability, operation costs, repair and maintenance costs and total expected output. Principle Component Analysis (PCA) is employed to provide insight on the importance of performance indices and to determine their weights. We formulate the problem of finding structure of parallel WVS (including choice of system elements) in order to achieve a desired level of system output by the minimal cost and maximum reliability. A genetic algorithm is introduced and applied as the optimization technique for the model formulated. A numerical example is presented to illustrate the ideas.

Resource Allocation: Sequential Design for Analyses Involving Several Types of Data
Christine Anderson-Cook[1], Todd Graves[1], Michael Hamada[1]
[1]*Los Alamos National Laboratory, United States*

In analyzing the reliability of complex systems, several types of data from full-system tests to component level tests are commonly used. After a preliminary analysis, additional resources may be available and we wish to identify the best new data to collect to maximally improve the prediction of system reliability. In this paper we present methodology for determining what new data should be collected to improve our understanding of the response. Issues discussed including a metric for assessing improvement, discrepancies between data sources and incorporating cost into a comparison of different data types.

Extended Warranty Policies with Warranty Options
Alagar Rangan[1], Vahidhossein Khiabani[1]
[1]*Eastern Mediterranean University, Turkey*

We consider a repairable system subject to two types of failures; minor and major requiring minimal repair and replacement respectively. Extended warranty models for the system that includes a free replacement period and an extended warranty period will be analyzed. Consumers have several warranty options during the extended warranty period. Explicit expressions for the manufacturer's long run average profit per unit time under these options are obtained. We also consider case of demand as a displaced log linear function of the product price, fixed warranty period and the extended warranty period. A numerical illustration is provided to demonstrate optimal product pricing and warranty period.

A Modified Imperfect Preventive Maintenance Policy under Reliability Limit
Mingchih Chen[1], Min Wang[1], Yu-Hung Chien[2]
[1]*Chaoyang University of Technology, Taiwan*
[2]*National Taichung Institute of Technology, Taiwan*

With the growth in complexity of modern systems, the cost of purchasing new systems becomes higher ever than before. Surprisingly, little attention in the literature has been paid to the failure replacement in these preventive maintenance models. However, in practice most systems incur increasingly expensive down time costs when the systems suffer the unexpected failures. The major changes to the standard maintenance model in this research are the addition of a failure replacement cost for a failed system and the reliability limit for which system has to be replaced. The objective of this research is to propose an efficient algorithm to obtain the optimal maintenance policy. The optimal maintenance policy is investigated with incorporating the costs of minimal repair, imperfect preventive maintenance, failure replacement and preventive replacement. The number of imperfect preventive maintenance and the control limits of the optimal maintenance policy are calculated under the expected average cost rate criterion.

Session	Service Innovation and Management 1
Date	12/9/2008
Time	11:00 - 12:30
Room	Mercury 3
Chairs	Kay Chuan Tan, Tianbiao Yu

Crisis Response: the Message Strategies and Media Coverage Model
Jianxin Shi[1], Minglu Yu[1]
[1]*Harbin Institute of Technology, China*

This paper adopted crisis life-cycle model and media coverage, based on different message strategies, set up a new model named Message Strategies and Media Coverage Model (MSMC model), to establish the relationship between the communication and message strategies the enterprises used in response to the crises and media coverage, and to discuss the impacts of media reports on enterprises in crises. With the Norton manslaughter and Rising manslaughter case, which resulted lots of computer systems paralyzed in China, this paper will verify the validity of the model, and analyze the different message strategies Symantec Corporation and Rising company adopted.

An Integrated Method of Kano Model and QFD for Designing Impressive Qualities of Healthcare Service
Chuang-Chun Chiou[1], Ya-Sheng Cheng[2]
[1]*Dayeh University, Taiwan*
[2]*National Taichung Institute of Technology, Taiwan*

Healthcare service industry is one of the fast growing service sectors in Taiwan. Customer satisfaction and patient-oriented service are becoming important issues and playing significant roles on establishing sustainable strategies. Due to lack of a systematically effective method of identifying patients' needs and voice, in this paper, we present an integrated methodology of Kano model and Quality Function Development (QFD). Firstly, Kano model is applied to identify customer needs, and calculate customer satisfaction coefficient that helps the manager to prioritize the importance of service qualities that can increase customer satisfaction. Then, by following the same procedures for product design the four phases of QFD are used to translate the voice of the patients' needs into the regular service planning. With this methodology, managers can straightforwardly identify and prioritize what customers need. The steps described here are practical procedures for improving and upgrading healthcare service. Furthermore, the results can facilitate the managers to develop sustainable strategies.

Analysis of Key Features in IPTV Service Quality Model
Kwang-Jae Kim[1], Wan-Seon Shin[2], Dae-Kee Min[3], Hyun-Jin Kim[1], Jin-Sung Yoo[2], Hyun-Min Lim[4], Soo-Ha Lee[4], Yong-Kee Jeong[4]
[1]*Postech, South Korea*
[2]*Sungkyunkwan University, South Korea*
[3]*SK Telecom, South Korea*
[4]*KT Technologies Labs, South Korea*

This paper develops an IPTV service quality model which consists of three layers of features, namely, QoE, QoS and NP. The key features and their relationships are identified via two-phase quality function deployment. The issues on the improvement of the IPTV service quality are also presented.

Service Quality, Homebuyers' Regret and Dissatisfaction in China Real Estate Market
Jiang Tao Chen[1], Eddie C.M. Hui[2], Zhong Ming Wang[3]
[1]*Zhejiang University, The Hong Kong Polytechnic University, China*
[2]*The Hong Kong Polytechnic University, Hong Kong*
[3]*Zhejiang University, China*

Surveys continuously revealed that many homebuyers suffer regret and dissatisfaction in China real estate market. Previous researches on residential satisfaction had focused on attributes of houses and individual characteristics, but the effects of service quality on post-purchase regret and satisfaction were largely ignored. This paper demonstrated that service quality significantly impacts residential purchasers' regret and dissatisfaction by three studies. Moreover, regretful or dissatisfied homebuyers were found to be likely to engage in word of mouth (WOM) in virtual communities instead of their social network. This article also indicated that the effects of regret on online WOM, voice complaint and complaint to a third party were mediated via dissatisfaction. Finally, implications for real estate service innovation and management practice and limitations of the study were discussed.

Reengineering Radiology Transcription Process through Voice Recognition
Balagopal Gopakumar[1], Shengyong Wang[1], Mohammad Khasawneh[1], Davette Cummings[2], Krishnaswami Srihari[1]
[1]*State University of New York, Binghamton, United States*
[2]*Wilson Memorial Regional Medical Center, United States*

Quality and timeliness of radiology reports are critical in the patient care delivery process. Voice Recognition (VR) has been viewed as a tool that could revolutionize the traditional radiology report transcription process and simultaneously improve the report generation quality. This paper proposes several potential metrics that could be used to monitor the impact of VR on the operations of a radiology department. Self-editing of reports holds the key to the reduction in report turnaround time, as well as the reduction in transcriptionist needs. Through process mapping of the current system and the future system after VR implementation, it was identified that the self-editing of reports may co-exist with the transcriptionist-based editing of reports due to radiologists' preferences. A simulation study was conducted to gauge the level of impact of self-editing. The results showed that report turnaround time could reduce to 2 hours (from about 21 hours) with comprehensive (100%) self-editing.

A Complex Networks Analysis on the Service Businesses of VIP Customers of a Telecommunication Department
Jianmei Yang[1], Guangchao Huang[1], Jianyong Feng[1], Yufeng Lai[1]
[1]*South China University of Technology, China*

Due to lack of an analysis framework, usually, the studies of service businesses of the telecommunication customers are based on the attribute variables of customers and service business types respectively, but few on relational variables of them. The development of complex networks approach provides a simple and effective framework for the analysis of a large amount of data of relational variables. By using the real VIP customers data of a certain telecommunication department of Guangzhou, in this paper,several complex networks models, including Boolean bipartite network, weighted bipartite network and one-mode projection networks models ,are constructed first. Then through exploring the distributions of the important relational variables (the node degree, the node strength and the edge weight) and the topological properties of these models, we discuss the consumption characteristics of the VIP customers at using the service business types of the telecommunication department, and their management meaning.

Session	Service Innovation and Management 2
Date	12/9/2008
Time	13:30 - 15:00
Room	Mercury 3
Chairs	Kwang-Jae Kim, Krishnaswami Srihari

A Fuzzy Multi-objective Optimizing Scheduling for Operation Room in Hospital

Di Wang[1], Jiuping Xu[1]
[1]*Sichuan University, China*

Operating room (OR) is the most resource-intensive place in a hospital as well as the bottlenecks of resource and patient flow during treatment process. A reasonable operating room scheduling plan can help to develop the utilization of operating room and increase patients' satisfaction. But most of the domestic hospitals haven't inducted scientific administration methods to build their operating room schedules in real-life applications. In this paper, we develop a fuzzy multi-objective programming model to optimize the OR scheduling, so as to gain the optimal results in mathematics. And we also provide a numerical example to test the model.

Exploring Innovation Model Combine with the Green Marketing to Consumer's Behavior Influence - a Case Study of a TFT-LCD Company

James K. C. Chen[1], Che-Fu Wang[2], Wen-Hsuan Tsai[2], Sin-Yi Lin[2]
[1]*Asia University, National Chiao Tung University, Taiwan*
[2]*Asia University, Taiwan*

Taiwan is an area with highest TFT-LCD industry density around the world, even exceed Japan and Korea, with anticipating, Taiwan will continue occupying leading position of the whole world in the following several years. Because of economy grows vigorously, the issue seriously damages our environment from day to day, advocating the green industrial revolution becomes one of the main trends in the 21st century, green marketing becomes the crucial operational policy of scientific and technological industry. This research plans to use Bass diffusion model as the foundation structure, putting into the price parameter, setting up the model of revising, regard A company LCD as the case. The result of study finds out the model of this research both right ability and predicts ability is weak signification; demonstrate the sale of influence LCD that green marketing will be ineffective at the same time.

The Analysis of Relationship Between Burnout, Engagement and Firm Performance-- Case Study in Hospitality Industry in China

Lei Wu[1]
[1]*Hunan Normal University, China*

The aim of this study was to determine the relationship between burnout, engagement and firm performance of employees in the hospitality industry of Changsha city in china. A job demands-resources model was used. The results indicated (1) burnout mediated the effort of high job demands on firm performance,(2)work engagement mediated the effects of job resources on firm performance.

Meta-Service Oriented Collaborative Design Platform for Complex Product

Jia-qing Yu[1], Jianzhong Cha[1], Yiping Lu[1], Nan Li[1], Sha-sha Yao[1]
[1]*Beijing Jiaotong University, China*

Nowadays, design of complex product is becoming more important but more difficult to achieve it. The increasing complexity of products and services offered by online stores and electronic marketplaces makes the identification of appropriate solutions a challenging task. Customers can differ greatly in their expertise and level of knowledge w.r.t. such product assortments. The distributed collaborative design for complex product is a new mode based on concurrent engineering and multidisciplinary collaborative design, using various domain knowledges of CAX / DFX. At present, the most advanced collaborative technology in the world is based on the Service-Oriented Architecture (SOA). According to the theory of intelligent engineering, this paper presents a novel definition - meta-service system, whose core is meta-service resources. Based on meta-service system, this paper gives a distributed collaborative design platform for complex product. Take the design and development of the railway bogies as an example to demonstrate the application and advancement of the new platform.

Research of Networked Technical Service Oriented Production Process Based on Multi-agent

Tianbiao Yu[1], Jing Zhou[1], Kai Zhao[1], Ge Yu[1], Wanshan Wang[1]
[1]*Northeastern University, China*

In order to improve quality and efficiency of technical service oriented production process, shorten producing cycle of product, a new mode of the technical service is presented, which is networked technical service based on multi-agent. This new technical service paradigm is different from traditional technical service paradigm. It has property of cooperation, automation and intelligence. It can integrate dispersed manufacturing and service resources more efficiently, create more value for enterprises and customers, and better innovative technology. Function of the networked technical service system is analyzed and based on it a three-layer network architecture of the networked technical service system is researched. For the system developing, the technology of multi-agent and the technology of data sharing and transformation are studied. Base on these works a prototype system of networked technical service is developed. Results of the system running prove the theory is correctness and the technology is feasibility.

An Application of OR and IE Technology in Bank Service System Improvement

Xiaobing Pei[1]
[1]*Tianjin University of Technology, China*

In this paper, we discussed the application of OR and IE technology in the activity of improving bank service efficiency. Using queue theory, we studied how to arrange queues and service windows in order to get the most efficiency of the system and the least latency time. Then, we used the methods of the time study and the act study to reform the disposal of workchart, improve operating action, enhance efficiency and reduce work intensity of bank staffers.

Session	Service Innovation and Management 3
Date	12/9/2008
Time	15:30 - 17:30
Room	Mercury 3
Chairs	Chuang-Chun Chiou, Jinghua Li

New Service Development Using Gap-based Quality Function Deploment: Hall Service of Mobile Telecommunication Case
Lei Xu[1], Jinghua Li[1], Xin Liu[1]
[1]*Zhejiang Gongshang University, China*

Quality function deployment (QFD) is a customer-oriented structural development approach in manufacturing whereas the Gap model told us the truth of service psychological process. Along the gaps in the circle of service satisfaction, a new model of service quality function deployment (SQFD) has been established to develop new service. A Chinese mobile telecom case study (hall service) has been employed to verify and revise the model. We found that the Gap-based QFD model expands the investigative scope of Gap study from Gap 1 and/or Gap 5 to Gap 1 to Gap 5. It is a useful tool to develop new service using a reasonable and delicate combination of Kano model, SERVQUAL scales, and Gap circle. The limitations source from the integration of psychological process and engineering tool, and the informal process of service development. Therefore, the situation and methodolohy of this model need to develop more.

Utilisation of Product Lifetime Information Across Organizational Boundaries in the Development of Maintenance Services
Toni Ahonen[1], Ville Ojanen[2], Markku Reunanen[1], Marinka Lanne[1]
[1]*VTT Technical Research Centre of Finland, Finland*
[2]*Lappeenranta University of Technology, Finland*

Development of industrial services offers product manufacturers new possibilities for the utilisation of lifetime information in a more effective way. Product lifetime information has several purposes of use including the development, management and implementation of services. Additionally, the manufacturer providing services has the advantage of efficiently utilising the accumulated information in the product development. Service provider can create added value by processing, analysing and converting the gathered data into knowledge that can be utilised in providing better services. Thus, the asset owner will benefit from sharing the information by receiving better managed and implemented services resulting in improved equipment efficiency. Sharing relevant lifetime information calls for transparency from all parties involved. Building the kind of framework presented in this paper for the shared information content and procedures for the utilisation of the information will help in clarifying the common objectives in the relationship between the customer and service provider.

Research and Analysis of Enterprise Capability Elements Based on Customer Value
Mingli Zhang[1], Wei Jia[2], Chenliang Li[2]
[1]*Beijing University of Aeronautics & Astronautics, China*
[2]*Harbin Institute of Technology, China*

The competition advantage stems from value creation for customers. Focusing on logistics enterprises, customer value composition are identified and a three-hierarchy framework is presented from a view of creating and delivering superior customer value. A model of fuzzy comprehensive evaluation on service capability of logistics enterprises is built. The local level of evaluation: knowledge recognition, unite activity, logistics service capability and so on. Secondary evaluation: information integration, business process and relationship marketing. The article adopts the fuzzy synthetical evaluation to evaluate the capability of logistics enterprise and offer the theoretical foundation for improving enterprise capability.

The Industrial Services Reference Model
Marco Gerosa[1], Marco Taisch[1]
[1]*Politecnico di Milano, Italy*

The need to integrate service providers into an existing customer supply chain requires the collective know-how of the coordination mode, including the ability to synchronize interdependent processes, to integrate information systems and to cope with distributed learning. About this topic the EU-funded InCoCo-S project is developing a new standard business reference model with key focus on operation & integration of business related services in supply chains. Based on the requirement analysis concrete business processes have been developed to integrate services in the existing customer supply chain both on a strategic and operational level.

Predicting Bed Requirement for a Hospital Using Regression Models
Arun Kumar[1], Jianxin(Roger) Jiao[2], Sung Shim[3]
[1]*RMIT University, Australia*
[2]*Nanyang Technological University, Singapore*
[3]*Seton Hall University, United States*

High hospital bed occupancy levels have resulted into a shortage of beds to meet increasing demand. This paper describes a bed prediction model in aiding hospital planners to anticipate bed demand so as to manage resources efficiently. Through the regression models, it was found that the number of weekly mean occupied beds is related to both the rainfall and the data on Dengue cases as provided by the Ministry of Health. The regression models performed well for predicting average class B2 and class C occupied beds in the following week. Previous week's mean occupied beds, emergency admissions numbers, A&E attendances and special events on the week were found to be significant predictors of bed occupancy in class B2 and class C wards.

Workforce Planning in the Banking Sector - A Case Study
Veronique Limere[1], Hendrik Van Landeghem[1]
[1]*Ghent University, Belgium*

In this paper we describe the development of a planning tool for a department of commercial credit applications of a large player in the Belgian banking sector. The tool is created to cope with service level agreements (SLA) that put a limit on acceptable throughput times of credit requests. Currently, SLA requirements are not well met and customer satisfaction is low. Because of the highly variable process times and complex flows with rework loops, a deterministic scheduler is not appropriate. Simulation is therefore used to model the processes. Firstly, matching simulation results with real data reveals if the processes are lean, and fine-tuning can be done. Secondly, based on simulation results a tool can be developed representing expected throughput times and SLA impact for different degrees of capacity utilization. Consequently, different workforce allocations can be tested and deliberate choices can be made.

Analysis for Critical Success Factors of Energy Performance Contracting (EPC) Projects in China
Yang Zhang[1], Qingmiao Han[2], Changbin Liu[1], Jinying Sun[3]
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[2]*Harbin Institute of Technology, China*
[3]*China Architecture Design and Research Group, China*

The energy shortage and energy waste have created a bottleneck in economic growth in China. The energy performance contracting concept provides a solution to overcome the difficult. An investigation of "critical success factors of EPC projects in China" has been carried out in energy service company and research institute. This paper identifies 23 CSFs and analyzes the most important CSFs of them. The 23 CSFs are divided into internal and external factors. Based on the analysis, some suggestions of improving the level of EPC project was given.

Competitive Strategy of Enterprise Based on the Principle of Ecological Niche
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[1]*Hebei University of Science and Technology, Beijing Institute of Technology, China*
[2]*Beijing Institute of Technology, China*
[3]*Hebei University of Science and Technology, China*

Having borrowed ideas from the principle of ecological niche, this paper presents the concept of "ecological niche" of enterprise. In this paper, ecological niche theory is used to discuss the enterprise ecological niche and the effect on enterprises' existence, developing. Abided by the following principles during the formation of their ecological niches: the principle of adaptation, the principle of competition, the principle of reclamation and the principle of balance, which refers to three further competitive strategies of enterprise: the strategy of dislocation business, the strategy of ecological niche continuation and the strategy of dummy ecological niche.

Session	Poster Session 1
Date	12/9/2008
Time	10:30 - 11:00, 15:00 - 15:30
Room	Venus 1

The Determinant of the Strategic Value with Human Resource Management on Transnational Enterprises
Tyrone T. Lin[1], Chie-Bein Chen[2], Yi-Shin Chen[1]
[1]*National Dong Hwa University, Taiwan*
[2]*Takming University of Science and Technology, Taiwan*

This study utilizes the real options approach to construct the model of entering the international manpower market in order to effectively evaluate the potential value and obtain the optimal foreign exchange rate under the uncertain situation. That is, building the decision rule and threshold for entering the international manpower market can help evaluate the influence of hiring domestic or foreign manpower on the enterprise value.

Product Line Management for Health Care System: Theoretic Capacity Planning Over Various Resources
Guangfu Tai[1], Peter Williams[1]
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Hospitals can be viewed as service enterprises, whose products are specific sets of medical services provided to individual patients. It indicates that a hospital in theory has a product line as extensive as the number of patients it serves, however, each patient has certain diagnosis and therapeutic attributes in common with some other patients. Thus, patients with similar medical attributes could be 'processed' in a single 'product line', which means treatment process of these patients can be regarded as process of medical resource consumption at average level of this patient group. Based on this assumption, in this paper, we propose a model to analyze theoretic capacity balance and optimal investment allocation over various medical resources. This paper argues the mismatch between demand and provision of health care service is not only relevant to capacity lack, but also reflect inappropriate capacity allocation over various health care resources.

The Impact of Decision-making during Environmental Mutation - Substantial Change of Fuzzy Error System
Qiwei Guo[1], Kaizhong Guo[1], Qinruo Wang[1]
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Environmental mutations always happen around all the systems, according to the impact of these changes which seems to be innocuous, the decision makers may often neglect or considered less about them, so that these systems will often pay their price. Through the exploration for the mutation of fuzzy error system, the status and characteristics of its model can be analyzed. Therefore, the decision-maker can adopt corresponding tactics to handle the intensive change of decision-making environment. At the same time, by the study for the mutation of error, it can provide a quantitative tool for scientific decision making. The major aim of this paper is to give a foundation for the application of the mutation of fuzzy error system. It will have widespread application in the actual live. By studying this theory, the case that has significant change in decision-making courses can be solved.

A Study on the Water Resource Pricing Problem Based on the Recycling Economy Concept
Qing Tian[1], Yixiu Cui[2], Xue Zheng[1]
[1]*Harbin Institute of Technology Shenzhen Graduate School, China*
[2]*Guangdong Institute of Science and Technology, China*

In order to establish a scientific and reasonable price of water resources and to exploit water resources reasonably, on the basis of literature reviews, this paper proposes a full cost water resource pricing model, points out the method to determine the water supply price, opportunity costs, external costs and the water resource price ceiling, and develops the water resource dynamic price model at the same time. Finally the paper takes Shenzhen as a case to test the validity of the model. The results indicate the reasonability of the method.

The Optimal Pollution Technical Standard Model with the Environment Economy
Tyrone T. Lin[1], Jing-Hong Huang[1]
[1]*National Dong Hwa University, Taiwan*

This study attempts to analyze what kind of environmental pollution technical standard to transform the new technology will have the maximum economic efficiency, and to decide when it is the best timing for transforming the environmental pollution processing technical standards.

A New EOQ Model for the Life Inventory of Tools
Chao Xu[1], Baozhi Xie[1]
[1]*Southeast University, China*

The traditional inventory model is on the assumption that the goods or materials in the inventory are lifeless. It is weak for the traditional theories of inventory to give a substantial description for the kinds of goods with some applicable lifecycle such as tools and molds. In this paper, tool inventory is taken as the discussed topic and a new tool life inventory model with some self-digesting engine is presented. Based on the performance analysis of the inventory, a new EOQ model is worked out. The data simulation of the model shows that it is better to describe the practical behavior of the tool life inventory. The cost of the inventory varies with its recovering ability and will be lower than that of the traditional inventory in some range. The traditional lifeless inventory model is just a special case of the economic life inventory model.

Cost Elasticity Analyzing Model of Construct Project
Dongbing Huang[1], Wen Zhang[1]
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To solve project cost control problem, the concept of project cost elasticity is introduced and the model of project cost elasticity analysis is proposed. Case study shows that the cost elasticity model is useful and helpful to control project costs. Finally, a road map is provided for stockholders to use cost elasticity model to control project costs.

Evalua-Test: a Random Test Generator
Teresa Alvarez[1], Eduardo Sanz[1], Estefania Sastre[1], Mohamed Bolajraf[1]
[1]*University of Valladolid, Spain*

Evalua-Test is an Internet tool that allows students to examine on-line their knowledge of certain subjects using a web application. It has been programmed using Java for the users' interface and Scilab for the mathematical calculations. Process Control and Communication Systems subjects taught at the Computer Science Engineering Degree by our department have been chosen for testing the tool.

Study on Personality Traits and Key competence of R&D Staff: An Empirical Analysis in Taiwan
Chung-Hsiung Fang[1], Ya-Chin Kang[1], Guan-Li Chen[1], Yu-Shan Cheng[1]
[1]*National Taiwan Normal University, Taiwan*

In the environment with sharp market competition, the enterprise could achieve the absolute advantage in technology, maintain the status of its product and establish the base of sustainable existence only by the continuous research and development. This study uses the reliability, validity, descriptive statistic, T test, and ANOVA. The objective of this study includes: finding and confirming the competence that an outstanding R&D staff should be provided by the conclusion of relevant domestic and foreign literatures and the interview with the industrial supervisors, and the discovery of this study could be used by the organization as the reference and suggestion in talent selection, performance evaluation, training, development, guidance negotiation and even the individual career plan in the future.

Development of Shop Floor Control System and Performance Indicators for Plastic Injection Manufacturing
Parames Chutima[1], Nonticha Nimsaard[1]
[1]*Chulalongkorn University, Thailand*

The objective of this research is to develop shop floor control systems and performance measurement indicators suitable for plastic injection manufacturing in Thailand. This research collects primary data from several factories and uses a systematically designed questionnaire to interview both experts and practitioners in the field. The shop floor control system represented by IDEF0 technique is then developed. Furthermore, the performance indicators (PI) of the production operations that conform to the real operations occurring on the shop floor are created. The results from the research can be used as a guideline for entrepreneurs in order to produce continuously and fully utilize the production capacity. In addition, they could use the selected performance indicators to assess the efficiency of their organizations and could benchmark against other entrepreneurs in order to find the ways for productivity improvement.

A Simulation Optimization Approach for Facility Layout Problem
Guoxin Wang[1], Yan Yan[1], Xiang Zhang[1], JingChang Shangguan[1], Yanqiu Xiao[1]
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In order to response effectively to the changes in product mix and volume, manufacturing facility need to be changed frequently. So the facility layout design becomes critical. In the paper, a simulation optimization methodology is proposed to resolve the facility layout problem. Firstly, candidate facility layout schemes are suggest by GA that automatically guides the system towards better solutions. Secondly, Simulation models are used to evaluate the performance of candidate facility layout schemes, the results of evaluation are returned to the GA to be utilized in selection of the next generation of candidate facility layout schemes to be evaluated. This process continues until a satisfactory solution is obtained. Finally, a case study is presented to illustrate the application of the proposed approach.

Research on the Driving Forces of Born Globals' Internationalization: Cases from Developing Country
Ying Zhou[1], Chang Li[2], Songting Pan[1]
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Born global (BG) is the new ventures with fast internationalization soon after its foundation. Constrained by resources limits, BG has to rely on network and resources to promote internationalization. This paper constructs a driving force framework composed with network and key resources to internationalization based on the view of network and resources. After defining key resources, this paper illuminates the networks' direct effects by forming trust and reciprocal and indirect effects by acquiring key resources on BG's internationalization with the multi-case research on enterprises from high-tech and traditional manufacturing industries in developing country.

Study on Activities of Daily Living of Human Body
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Study on Activities of Daily Living(ADLs) can be used in many research fields, but it is very complex. In this paper 40 basic ADLs were summarized by collecting and analyzing all the ADLs of human body. Then the experiments on 9 healthy adults who performed these 40 activities were conducted. All the procedure was recorded by using a digital vidicon. As a result 17 typical basic actions were obtained by disassembling and abstracting each ADL. These basic actions can substitute for ADLs when we research on the ROM in motion measurement of human body and other research fields, such as study on safety ergonomics of the living space for the aged and disabled, evaluating an individual's ability to perform ADLs etc. Experiment efficiency can be improved greatly with the results of this paper.

Association Rule Mining for Affective Product Design
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Affective product design implies a gradual shift of design focus from functional aspect to affective/emotional aspect. It evolves as an interdisciplinary research topic between human factors, industrial design and many other disciplines. This paper applies association rule mining to reveal the mapping relations between customer affective needs and configuration of design elements. Generic affective dimensions of truck cab design were identified by clustering analysis. A goodness criterion was introduced to refine association rules. A case study of Volvo truck cab design was conducted based on the proposed methods.

How to Design and Process Brand Identity through an Integrated Innovative Approach
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[3]*King Mongkut's University of Technology North Bangkok, Thailand*

Presently, the leather goods industry in Thailand is facing a severe competition. According to customers the quality and image of products from Thailand are dissatisfying. Thai products often not meet customer satisfactions and requirements mainly due to lack of identity. The research aims to evaluate the brand identity to semantics and presence of design elements, and to validate the perceived message according to what is expressed in product advertising associated with the perception of customers. This paper focuses on the analysis of customers' perception after the detailed design of the product. It includes 2 phases. The first phase aims to explore the customers' perception to product visual form of luxurious brand. The second phase aims to explore the design elements with express brand identity. This approach will lead further study in order to improving the design expression through specific design elements.

An Administrative DSS for the South-to-North Water Division Based on Multi-agent
Chunlai Chai[1], Jingchun Feng[2]
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The South-to-North Water Division Project is by far the world greatest key water conservancy project under the direct leadership of the State Council of China. The administrative decision-making is very important for Construction and Management regulatory agencies. However the decision-making procedure has been low efficient for the past few years. An administrative DSS based on multi-agent technology is proposed in this paper, which improves the decision-making effectiveness and efficiency through the distributed collaboration of different decision-making agents. With rapid development of computer science, this decision-making support system may act as a new paradigm for the administrative decision-making.

A Technology Roadmap on SOA for Smart Embedded Devices: Towards Intelligent Systems in Manufacturing
Alessandro Cannata[1], Marco Gerosa[1], Marco Taisch[1]
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Intelligent systems, composed of devices with embedded computing capability, sensors and actuators to interact with the environment, will enhance and support manufacturing in the future. SOCRADES (Service-oriented cross-layer infrastructure for distributed smart embedded devices) is a European research project that focuses on the development of a platform for next-generation industrial intelligent systems, exploiting SOA paradigm. Within SOCRADES a Technology Roadmap is being developed. Its aim is to provide inputs for the orientation of technological research to achieve the long term objectives required for the enhanced and pervasive exploitation of intelligent systems for manufacturing support. We present the Expected Features of Technology Areas (EFTAs) identified within SOCRADES Technology Roadmap. Then we show how the outcome of SOCRADES Technology Roadmap addresses important needs such as those pointed out by the Strategic Research Agenda

developed by ARTEMIS (European Technology Platform for Embedded systems).

Study on Motion Measurement of Human Upper Limb Based on Electromagnetic Tracking System
Jianguo Zhang[1], Haiyan Song[1], Qiang Xue[1]
[1]*Tianjin University of Science &Technology, China*

The measurement and analysis of human motion is widely used in rehabilitation, athletics, ergonomics, diagnosis, bionics and computer graphics etc. We have developed a motion measurement and analysis system for human upper limb based on PolhemusTM electromagnetic tracking system in this paper. According to the skeleton structure of human, the joint coordinate systems were built in shoulder, elbow and wrist joint. Then put forward an improved algorithm to calculate motion parameters of upper limb based on above-mentioned model, and successfully programmed the algorithm with Visual C++ which can calculate the range of seven DOF in motion with data collected by the electromagnetic sensors. Finally, basic actions of human arm in ADLs were measured using this system, and the range of seven DOF in motion were got .The test shows it is an accurate and easy way for motion measurement of upper limb.

A Differential Evolution Approach for Machine Cell Formation
Yucheng Kao[1], Jin-Cherng Lin[1], Jian-Kuan Wu[1]
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This paper presents a new approach based on differential evolution algorithms to solve cell formation problems. The proposed approach handles the problem in a way of data clustering and can form machine cells and part families concurrently. Differential evolution is simple to implement and has fewer parameters needed to set. The proposed approach applies differential evolution to find machine cluster centers and part cluster centers at the same time. A number of test problems had been selected from literature and the experimental results reveal that the proposed approach is able to solve cell formation problems effectively.

The Responsiveness of Order Fulfillment in BTO: Five Cases of Chinese Automotive Manufacturers
Xiang Zhang[1], Rongqiu Chen[2], Guoxin Wang[1], Yanqiu Xiao[1], JingChang Shangguan[1]
[1]*Beijing Institute of Technology, China*
[2]*Huazhong University of Science and Technology, China*

Responsiveness is one of the key factors for the success of build-to-order (BTO) strategy. This paper aims to analyze the responsiveness of order fulfillment of BTO strategy in the Chinese automotive industry. Using the data collected at five Chinese automotive manufacturers, we find that the optimization of order processing is the key point to shorten the total OTD time. In addition, we obtained the time distribution of order-to-delivery process of BTO, including the order processing stage, producing stage and outbound logistics stage.

An Improved Particle Swarm Optimization for Pre-denoise at the Exhaust Pipeline Design Stage
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[2]*Xi'an Jiaotong University, China*

Optimization pre-denoise at the exhaust pipeline design stage based on an improved particle swarm optimization (IPSO) is presented in this paper. Particle swarm optimization (PSO) is easily understood and realized, and used as a problem-solving method to many complex engineering problems. Cloud model is used to standard PSO to improve the global search ability and make the convergence faster. In the IPSO, cloud model is used to initialize the particle swarm and update the velocity equation. Inertia weight nonlinearly decreases with iteration time process in the improved velocity equation. The improved particle swarm optimization is applied to pre-denoise by optimizing at the exhaust pipeline design stage. The calculated results show that IPSO outperforms standard PSO in solving the pre-noise problem.

Process Capability Analysis for Life Cycle Application
Angus Jeang[1], Chien-Ping Chung[1], Chiao-Ju Hung[1]
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Process capability analysis was used to measure and control the quality level of a process in real exercises for an on line quality management. There is a deficiency in this type of management, namely the defects which occurred in the production process were only detected and modified afterward, and passively. Generally, improvement by the correction of defects is very costly and inefficient. Hence, there is an attempt to broaden the time frame of process capability analysis from the end of process planning or product design, i.e., on line application, to the beginning of process planning or product design, i.e., off line application. In this regard, the present research develops a process capability analysis for the application covering pre-production stage, on-production stage, and post-production stage. The new process capability analysis is extended from conventional Cpm with consideration of the balance between production cost and quality loss.

New Model and Hybrid Genetic Algorithm for Component Placement of Multi-head Gantry Mount Machine
Xuan Du[1], Zongbin Li[1]
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The mechanism and placement process of multi-head gantry mount machine (MHGM) is analyzed. Based on the engineering analysis, the optimization problem of placement process is decomposed to component grouping, component group pickup and component group placement problems, an integrated optimization model of MHGM is formulated, the minimum displacement of arm is objective. The component size, nozzle change and different component arrangement strategy in slots is considered. Combined with heuristic method and genetic algorithm (GA), a hybrid GA (HGA) is adopted to optimize the placement process. In the individual chromosome, the feeder index and slot index describe the arrangement sequence and position of component types in the slot. The HGA use improved order crossover, adaptive mutation and local search and contains a parallel structure. The component placement sequence and the feeder arrangement are optimized simultaneously to improve the assembly efficiency.

Study on a Design Model for the Combined Functional Periodicity Obtaining Process
Peng Zhang[1], Zhonghang Bai[1], Fang Liu[1], Runhua Tan[1]
[1]*Hebei University of Technology, China*

The obstacle is that functional periodicity is difficult to obtain when Complexity Theory based on Axiomatic Design is used to eliminate system's complexity. There are several kinds of characteristics in the complex problem. It is the key for the characteristics to help designers obtain the simple functional periodicity. But if the features are not obvious or the simple functional periodicity obtained by the characteristics can not eliminate the complexity, the combined functional periodicity should be introduced to eliminate the system's complexity. This paper proposes a new design process which combines Complexity Theory with Theory of Inventive Problem Solving (TRIZ). The design process can help designers obtain combined functional periodicity of the system. A case study shows the application of the process.

Function-oriented Product Integrated Innovation
Fang Liu[1], Yu Yang[1], Peng Zhang[1], Runhua Tan[1]
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Functional integration is an effective approach to product innovation. The laws of needs evolution proposed by Petrov are introduced. The future needs of a product are forecasted by using the laws of needs evolution. Customer needs can be satisfied by functional integration. Three functional integration modes are proposed, and contradiction in functional integration is discussed, which can be solve by TRIZ. A process model of function-oriented product integrated innovation is put forward. A case study of heat meter illustrates the innovation process.

Coned Context DEA Model with Application to Mutual Funds Evaluation
Xiujuan Zhao[1], Wuyi Yue[2]
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This paper proposes a coned context-dependent DEA model by incorporating cone ratios into context-dependent DEA models. This allows for the input of experts knowledge and judgment in the production of rational scores that evaluate mutual funds relative attractiveness and progress. Based on this model, we make an empirical study of mutual funds in China and manage to draw some insightful management information. The paper shows that the coned context measure helps investors to select the best fund and helps fund managers to identify any potential competitors. The reason of performance differences and improvement venues are also analyzed.

Using Predicting Particle Swarm Optimization to Solve the Vehicle Routing Problem with Time Windows
Chun-Ta Lin[1]
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In this paper, the Predicting Particle Swarm Optimization (Predicting PSO) algorithm based on original PSO which modified by three new solution strategies has been proposed to solve the well known VRPTW problems. Predicting PSO algorithm not only can modify the variance between current status and memorial best status, but also can forward predict what the best status should be at next time status based on memory. The Predicting PSO algorithm has also been tested on Solomon's benchmark problems. The findings indicate that the proposed algorithm outperforms other heuristic algorithms.

Enterprise Systems Success Assessment: Viewpoints of IS Function Staff and End-users
Mikko Kaataja[1], Ilkka Kouri[1]
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The success of Enterprise Information System implementation has become a major management concern. Different methodologies have been proposed to evaluate En-terprise System (ES) success. Some researchers have empha-sized the need for evaluating the ES success from the view-points of several stakeholder groups. These stakeholders typically have several and often conflicting objectives and priorities. The goal of this study is to determine whether differences exist between two organizational stakeholder groups (IS function staff and end-users) concerning their evaluation of measures relating to the success of their Enter-prise System. Several differences were found. Some results support and some contradict previous studies. This study also proposes new dimensions and measures for the ES suc-cess assessment model. More research is needed to construct a more comprehensive ES success assessment model to in-clude the perspectives of all essential stakeholders.

Developing a Procedure-based Genetic Algorithm for Overlapping Flow Shop Scheduling
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[1]*Fu Jen Catholic University, Taiwan*
[2]*Huafan University, Taiwan*
[3]*National Taiwan University of Science and Technology, Taiwan*

This study makes an attempt to develop a procedure-based genetic algorithm, abbreviated as PBGA, heuristic for solving the scheduling problem of overlap manufacturing. In spite of the mathematical formulation-based GA approaches had received considerable attention; the tasks of developing the formulation and then converting into GA heuristic are still troublesome. Accordingly, the attempt uses the scheduling procedure directly in GA's heuristic to solve overlap flow shop scheduling problem. By avoiding the mathematical formulation, the proposed heuristic is expected to be more acceptable by the users in flow shop environments and helpful as an effective overlap scheduling tool for different interests.

An Integrated Scheduling and Automated Material Handling Approach for Complex Manufacturing Systems
René Drießel[1], Lars Mönch[1]
[1]*University of Hagen, Germany*

In this paper, we suggest an extension of the shifting bottleneck heuristic for complex manufacturing systems that takes an automated material handling system (AMHS) into account. We use the heuristic within a rolling horizon approach. Simulation experiments with models of manufacturing systems with process conditions similar to those found in semiconductor wafer fabrication facilities (wafer fabs) are performed.

Innovation Intermediary for Creating Regional Knowledge Capabilities in Knowledge Cluster
Chia-Han Yang[1], Chih-Jen Chen[1], Joseph Z. Shyu[1]
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This research aims to analyze the role of innovation intermediaries in regional knowledge clusters. Particularly, a service approach of innovation strategy, namely, the intermediary platform, is used as an analytical model to explain the business operation of innovation intermediaries and their interaction with knowledge clusters in regional innovation system. In this model, the concepts of industrial environment and technological system were adopted to represent the building blocks of knowledge cluster. Accordingly, the correlation between the firm-level operational resources of innovation intermediaries and industrial environment as well as technological system, would be constructed to discuss the necessary support of sectoral innovation system for fostering the development of innovation intermediaries .The result reveals that the regional innovation intermediaries could integrate their value activities and externalities effectively with the support of specific industrial environment and technological system, thereby facilitating the knowledge spillover and creating the regional knowledge capabilities in the sectoral innovation system.

An Approach to Numerical Modeling and Simulation of Cellular Foam Sandwich Structures in Commercial FE-Softwares
Joerg Feldhusen[1], Sirichai Torsakul[2], Alexander Brezing[1], Sivakumara Kannappan Krishnamoorthy[1]
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[2]*Rajamangala University of Technology, Thailand*

The difficulty in modeling and simulation of sandwich materials lies in its intrinsic anisotropy; non-homogeneity and choosing appropriate assumptions that allow proper joining of face sheets with the core material. The accuracy of simulation results depends on the modeling assumptions and capabilities which may vary from software to software. This paper describes the methods and strategies for 3D-modeling and simulation of sandwich beams using commercial FEM-Systems (ANSYS 10, ABAQUS 6 and ALGOR V18) and its interface with CAD-systems. The evaluation of the commercial FEM-Systems was carried out using the so called Use-Value Analysis suggested in Pahl/Beitz [1]. This could help a design engineer to choose appropriate software for sandwich design. The four-point bending test is performed in order to determine the load-deflection behaviour of a sandwich beam under static loading. The FEM results are compared with the results of experiments and the theoretical predictions. Results obtained by using the FEM have shown excellent agreement with the results of experiments and the theoretical predictions.

Key Factors of an Innovative Organization to Adapt to Changing Global Management
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[2]*Ching Kuo Institute of Management and Health, Taiwan*
[3]*Jinwen University of Science and Technology, Taiwan*

A top priority of global management is to manage change, which requires establishing an innovative organization to be responsive to change. Traditional and matrix organizations lack an effective horizontal structure to construct core elements required for organizational learning. An innovative organization is required to implement those core elements such as self-actualization, self-development, social acceptation, shared vision and transformational leadership. Managerial innovation is achieved by incorporating organizational learning within the innovative organization. The alignment of the core elements required for

organizational learning with the key factors of an innovative organization enables an environment inspiring individuals' passion and initiative to manage change. Factors critical to the successful deployment of an innovative organization are presented in this study in terms of volunteer assignment, multi-task competence, autonomous community, employee entrusted authority, floating authorization and peer-group decision making.

Research On Object Oriented Information Modeling In Manufacturing Planning for CAPP

Faping Zhang[1], Yanqiu Xiao[1], JingChang Shangguan[1], Houfang Sun[1], Shahid I. Butt[2]
[1]*Beijing Institute of Technology, China*
[2]*National University of Sciences and Technology, Pakistan*

Information modeling for tiered activities in CAPP is studied for the generation of manufacturing plan. Based on the systematic information modeling methodology, objects information activities and their relationship in manufacturing planning (MP) have been analyzed. The Object-oriented Systems Analysis (OSA) approach is used to describe the static and dynamic characteristics of information involved in MP. Therefore, the correlative relationships within the MP from part design to manufacturing plan can be properly described. A tri-level decision-making mechanism is employed to formulate the manufacturing planning model. So, the computer aided manufacturing planning (CAMP) under certain manufacturing resources has been realized. Finally, a case study of manufacturing planning is presented to verify the feasibility of the method

Managin Logistics Flows Through Enterprise Input-Output Models

V. Albino[1], Antonio Messeni Petruzzelli[1], O. G. Okogbaa[2]
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In the present paper, we propose the use of enterprise input-output (EIO) models to describe and analyse the logistics flows considering spatial and environmental effects associated with production processes. In particular, transportation is modelled as a specific production process, both at an aggregate and disaggregate level, then permitting to cope with more managerial or policy oriented problems. Moreover, the use of EIO models can be useful to represent and analyse logistics services markets, accounting and planning the demand and supply of transportation.

Regional Economic Effect and Ideal Economic Scale of Tourism

Keiichi Iso[1], Tsutomu Mishina[1], Yoshiaki Shimazaki[1], Takazumi Ishibashi[1]
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This study estimates the economic impact of local tourist spending through its multiplier effect and develops a method to estimate the ideal economic scale of local tourist industry. We conducted quarterly survey of tourist spending in Yuri, Akita during 2006. Using survey data, we first estimate the actual scale of tourist industry in Yuri, and find that it is approximately ¥20 billion. Further, we identify an ideal tourist, who spends relatively more than others, by regressing tourists expenditure on their various attributes. Assuming that all visitors are ideal tourists, we estimate the "ideal scale" of the economic impact. The result shows that the estimated ideal economic scale is about ¥40 billion, which is approximately twice the actual scale. The developed methodology is applicable to other region and will be useful for policymakers, who are interested in enhancing regional economy through tourism.

Selection of Optimum Maintenance Strategy for Power Plant Equipment Based on Evidential Reasoning and FMEA

Yuliang Dong[1], Yujiong Gu[1], Xiao-feng Dong[1]
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Aiming at the problem that it is difficult to select optimum maintenance strategy for power plant equipment, a method based on criticality evaluation and failure mode characteristic analysis is put forward. In the method, the uncertainty and incompletion of criticality evaluation factors are completely considered, qualitative and quantitative evidences are integrated and their acquisition and transformation method is put forward based on constructing criticality evaluation multiple-attribute decision tree. Then a decision tree criticality evaluation model is established, a corresponding evidential reasoning algorithm is deduced, and the equipment in power plant is ranked by criticality. Integrating the results of criticality evaluation and failure mode and effect analysis (FMEA), the decision model of selecting optimum maintenance strategy of power plant equipment is established and applied in a fossil-fired power station. It is shown by the instance that this method is feasible and effective, can select optimum maintenance strategy for power plant equipment.

Session	Technology and Knowledge Management 4
Date	12/10/2008
Time	11:00 - 12:30
Room	Venus 2
Chairs	Shin-Guang Chen, Hongyi Sun

Intellectual Capital and Firm Performance in Chinese Creative Industry Firms

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Most knowledge development efforts in intellectual capital and creative industries have focused on Western economies and companies. This study develops and tests empirically a theoretical model that focuses on how intellectual capital variables influence firm performance in developing countries under the conditions of knowledge economy. Based on the literature and in-depth interviews, the authors developed 7 research hypotheses and examined empirically these hypotheses using the data collected from 168 Chinese creative industry firms by means of "on-site" survey. The findings suggest that elements of intellectual capital including human capital, structural capital, intellectual property capital and relationship capital have almost positively direct effects on firm performance. However, control variables including external environment and firm size have negatively direct impacts on firm performance.

The Relationship on Information Technology Capability and Performance: An Empirical Research in the Context of China's Yangtze River Delta Region

Hao Jiao[1], I. C. Chang[1], Y. Lu[1]
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Information technology (IT) capability plays an important role in the rapidly changing environment. With the development of information technology and wide adoption of Internet access and services, the enterprise must build and enhance their information technology capability. Through reviewing relevant literature and case studies, we summarize the components of the information technology capability. Specifically, we use empirical study to verify that information technology capability is comprised of four dimensions, namely IT architecture and routine, IT infrastructure, human IT resource and IT relationship assets. Moreover, we designated an index system of information technology capability. Based on a large-scale questionnaire study, this paper examines the IT capability's contribution to enterprise performance based on 145 valid samples. The findings indicate that, IT capability is positively associated with the firm's performance. Among the IT capability's contribution to performance; the effects of different capabilities are different.

Performance Measurement System and Staff Perceptions of Learning: Empirical Evidence from China

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With the survey data from the 112 firms examined in China, the relationship between performance measurement system (PMS) and staff perceptions of learning is validated by empirical study. The result shows that those firms with higher maturity performance management systems report better outcomes of staff perceptions of learning. Concretely, PMS formalization has a significant positive impact on staff perceptions about opportunity to learn; PMS integration with other firm systems has a significant positive impact on staff perceptions about motivation and capability to learn; PMS utilization has a significant positive impact on staff perceptions about motivation, opportunity and capability to learn. The findings of the study show that a firm can facilitate staff learning by improving PMS maturity.

Challenging Work as a Mediator of the Relationship Between Time Pressure and Employee Creativity in R&D Organizations

Lien-An Hsu[1], Hsueh-Liang Fan[1]
[1]*National Chengchi University, Taiwan*

This study examines the effects of time pressure on R&D employees' creativity as well as whether challenging work mediates the positive relationship between time pressure and creativity. Longitudinal data are collected from 187 R&D employees at a national research institution in Taiwan across two periods of time. Results of path analysis using structural equation modeling indicate that time pressure retards employees creativity. Furthermore, when people perceive time pressure and make the job more challenging, there can be a positive relationship to employee creativity. Implications and suggestions for researchers and practitioners are provided in the end of this paper.

Research on Uniform Product Development Model

JingChang Shangguan[1], Yan Yan[1], Houfang Sun[1], Runhong Wang[1], Liqun Wang[1], Haitao Liu[2]
[1]*Beijing Institute of Technology, China*
[2]*Shandong Wuzheng Group Ltd. Co., China*

To improve knowledge management and service levels, and achieve integration of software used in the whole product development process are research purposes here. Existing problems in current researches of non-semantic and semantic models are analyzed. Product development process itself, i.e. origin of semantic information of product, is studied wholly as the research object. Through research on Design Methodology, existence of Uniform Product Development Model (UPDM) and its value is proved to be true. Two points about significance of the Ontology applied in engineering field is introduced, and adequate cause in using Ontology to express UPDM is given. Framework of UPDM, which includes two parts, i.e. Product Development Ontology Model (PDOM) and Product Development Evaluation Model (PDVM), is introduced in detail. PDOM and PDVM are constructed by using some concrete theories of Design Methodology and OWL (Web Ontology Language). This model has been successfully used in knowledge integration in a research institute.

The Evolution of Knowledge Network in Manufacturing Cluster: A Case in China

Jingjing Guo[1], Bin Guo[1]
[1]*Zhejiang University, China*

This article explores the evolution of knowledge network in manufacturing cluster based on the change of different actors' roles in each evolution stage of cluster knowledge network. The result shows that there are four types of firms in the knowledge network, which are the leading producers, second best producers, niche producers and suppliers, and each type plays different roles respectively at the start-up stage, formation stage, development stage and maturity stage of knowledge network in the clusters.

Session	Technology and Knowledge Management 5
Date	12/10/2008
Time	13:30 - 15:00
Room	Venus 2
Chairs	Chui Young Yoon, Wim Vanhaverbeke

Does Technological Performance Gap Drive Product Performance?: An Explorative Study of Personal Computer Gaming

Ozgur Dedehayir[1], Saku Makinen[1]
[1]*Tampere University of Technology, Finland*

In this paper we firstly develop a means to measure the technological performance disparity between evolving technological sub-systems of the PC (personal computer) system and subsequently employ this measure in the study of the GPU (graphics processing unit) and PC game sub-systems' evolutions. Secondly, the paper explores the connection between the observed temporal behavior of technological performance gap and the product performance of PC games, as measured by game ratings. Our findings suggest that the level of technological performance of the PC game sub-system trails that of the GPU sub-system within the analyzed timeframe with growing technological disparity. In addition, our exploratory study of the evolution of technological performance and its relationship with product performance does not highlight a noteworthy connection, implying that game developers are not assured of high performance of their products despite being first to develop products of higher technological performance.

Reach and Richness: Towards a Theory of Knowledge Sharing Mechanism Selection

Lizi Jiang[1], Kah-Hin Chai[1], Wenting Liu[1]
[1]*National University of Singapore, Singapore*

The paper proposes a framework which links knowledge mechanisms with the knowledge sharing process for better intra-firm knowledge sharing. We view knowledge sharing as a process that comprises awareness and transfer. Knowledge sharing mechanism determines in what forms the knowledge is represented and through what intermediate steps it flows from one end to the other. Two dimensions, namely "Reach" and "Richness" characterize the nature of knowledge sharing mechanisms. In this study, empirical evidence proves that mechanisms used at stage awareness are more likely to have a high degree of "Reach" while mechanisms used at stage transfer are more likely to have a high degree of "Richness". Additionally, it is hypothesized that using a mechanism with high "Reach" is more likely to be effective at stage awareness of knowledge sharing while at stage transfer, use of mechanisms with high "Richness" creates higher efficacy. Survey results gathered partially confirm the hypotheses.

Agent-based Tool To Support Collaborative KMS In Software Maintenance Process Environment

Mohd Zali Mohd Nor[1], Rusli Abdullah[1], Mohd Hasan Selamat[1], Masitah Ghazali[1]
[1]*University Putra Malaysia, Malaysia*

Software maintenance (SM) environment is highly complex, knowledge-driven and collaborative. Therefore, knowledge management system (KMS) is critical to provide an environment for sharing and sustaining knowledge among members of SM community of practice (CoP). One of the important but least available knowledge required by maintainers is the Domain Business knowledge and the relations to the application SM process knowledge. Several KM retrieval tools are compared to identify the areas that still requires human experts and a new tool based on an extended SM ontology and multi-agent system (MAS) is proposed to assist CoP members to get the right knowledge at the right time

Cluster Innovation Capabilities: Concept, Structure and Evolution

Jiang Wei[1], Min-fei Zhou[1]
[1]*Zhejiang University, China*

Based on capability-based view and evolutionary theory, this paper defines the connotation of cluster innovation capabilities (CIC), and constructs a conceptual model of CIC's structure, which involves both static/dynamic levels and contains five internal dimensions. Besides, the basic logic of CIC evolution is also presented. As a result, a preliminary theoretic framework of CIC is constructed based on the aforementioned works.

A Preliminary Study on the Current Status of New Product Development in Singapore

Han Tong Loh[1], Jie Sun[1], Wen Feng Lu[1], L. S. Nyeow[1]
[1]*National University of Singapore, Singapore*

New Product Development (NPD) is important to sustain the competitiveness of a company in facing the strong market competition. However, past studies on NPD in Singapore in year 2003 and 2004 revealed that only minority of the companies was engaged in NPD. To support the effort of moving Singapore to be a design hub that is internationally recognized, this work presents a preliminary study of the current status of NPD. A better insight into the status of NPD will be useful for the relevant institutions and companies in taking appropriate action to improve and encourage more NPD activities. By using a sample of 114 companies that responded to a survey conducted, this paper examines NPD activities from different aspects. Comparisons with past studies are made to provide a view on the changes in over the years. The results show that only minority of the companies are engaging in NPD. Nevertheless, a comparison with past studies suggests an increase in the level of sophistication of NPD involved.

Modelling the Diffusion of Innovation Management Theory using S-curves

Alan Pilkington[1]
[1]*University of London, United Kingdom*

This paper explores the suitability of using diffusion S-curves to describe and compare the diffusion of citations within the innovation management discipline. There is some debate as to how to extend the existing measures of bibliometrics and modelling instead of indexes is just one option being explored. The ISI Citation data on the ten leading journals in the innovation management field are modelled and compared using a wide range of distributions. The resulting grouping of journals appears to be a useful proxy for academic-practitioner involvement and warrants further investigation. The finding that the three-parameter Inverse Gaussian is the best fit to the data extends the understanding of this process.

Session	Technology and Knowledge Management 6
Date	12/10/2008
Time	15:30 - 17:30
Room	Venus 2
Chairs	Sheng-shyr Cheng, Jie Sun

Matching Niche Strategy and Technology Capability of Latecomer Firms: A Case Study
Guoqing Yan[1], Xinmin Peng[2], Ruyan Hong[3], Haibo Zhang[1]
[1]*Zhejiang Wanli University, China*
[2]*Zhejiang University, Zhejiang Wanli Universiy, China*
[3]*Zhejiang University, Hangzhou Normal University, China*

The dynamic matching mechanism between different niche strategy and technological capability is explored from the evolving perspective from the case of CHINT Group, which is a firm in China. The niche strategy can be categorized two kinds of product niche and process niche according to the different competitive position. The technological capability can be divided into duplicative imitation, creative imitation, and endogenous innovation in terms of evolving process. Finally, this paper propose that the latecomer firm's niche strategy should be process niche dominated, process and product niche coordinated and product dominated in turn according to the three development stages of technological capability.

The Application of Tools and Techniques in a Unified Service Design Theory
Qi Zhou[1], Kay Chuan Tan[1]
[1]*National University of Singapore, Singapore*

This research focuses on the execution-oriented back end of new service development. It reviews extensively existing theories of service design and the tools and techniques used at the design stage. Based on a review of several well-known service-research academicians, this research unifies the state-of-the-art thinking on service design by proposing three tracks of activities. To make the design process more effective and efficient, we also classify the tools and techniques identified in the literature according to the three tracks.

Design of Event Driven Digital Right Management by Using Theory of Inventive Problem Solving
Song-Kyoo Kim[1]
[1]*Samsung Electronics Co., Ltd, South Korea*

This paper deals with the practical approach of technology enhancement in mobile industry by using technology innovation tools. TRIZ (Teoriya Resheniya Izobretatelskikh Zadatch) that is also called TIPS (Theory of Inventive Problem Solving) is a methodology and model-based technology for generating innovative ideas and solutions for problem solving. In addition, it is also most practical technology innovation tool that have been originally designed by Genrich Altshuller. In the other hand, Digital Right Management (DRM) is considered as the target of applying the TRIZ for technology enhancement because DRM is one of most critical features in the mobile industries. DRM is the access control technology to be used by issuers and other copyright holders to limit usage of digital media or devices. Event driven Digital Right Management is the new DRM technology that has been designed by using TRIZ method. Unlike general right objects, event driven DRM controls the right object based on events. TRIZ methodology is applied for mobile technology enhancement in this paper.

Customers' Knowledge and Personal Attributes in Promoting Demand for Wood Pellet Heating Technologies
Aija Tapaninen[1], Marko Seppänen[1]
[1]*Tampere University of Technology, Finland*

Billions of Euros are spent developing a range of green technologies, including bio heating technologies, as part of a push into the renewable energy market. One technological alternative for an innovative domestic household is wood pellet heating system. Diffusion of wood pellet heating has been studied previously but only limited attention has been given to customer knowledge and personal attributes influencing adoption decisions. Hence, the purpose of this paper is to examine knowledge of this bio-fuel technology and the impact of the personal attributes and perceived knowledge of the innovation on its adoption in Finland. The results support existing theoretical models and provide evidence of significance of customer knowledge and personal attributes in demand creation. Finally, the managerial implications of the results are discussed.

Absorptive Capacity Moderates the Relationship between Knowledge Sharing Capability and Innovation Capability
Luciana Andrawina[1], Rajesri Govindaraju[1], TMA Ari Samadhi[1], Iman Sudirman[1]
[1]*Bandung Institute of Technology, Indonesia*

The research investigates the relationships between knowledge sharing capability, absorptive capacity, and innovation capability. We used statistical hypotheses and Structural Equation Modeling to study these relationships based on the data sampled from 114 companies of information and communication technology industry in Indonesia including telecommunication service provider, support service provider, network vendors, and consumer devices vendors. Four hypotheses will be tested in this study, to find out whether absorptive capacity is the intervening variable between knowledge sharing capability and innovation capability. The result shows that knowledge sharing capability has a significant influence to potential absorptive capacity. While realized absorptive capacity is significantly influenced by potential absorptive capacity.

Total Innovation Management competence and innovation performance in SMEs -An Empirical Study Based on SME Survey in Zhejiang Province
Qingrui Xu[1], Jin Chen[1], Litian Chen[1], Lu Jin[1], Dong Lou[1]
[1]*Zhejiang University, China*

Total innovation management (TIM), innovation competence and performance in SMEs are discussed in this paper. After brief introduction of TIM, this paper analyzes the key innovation management capabilities including strategy innovation capability, technological innovation capability, and marketing innovation capability, etc, which influence firm's performance greatly. Based on over more than 200 SMEs survey in Zhejiang Province and 2 case study, this paper shows that the innovation performance in SMEs is affected by Total Innovation Management competence. Then relevant policies and recommendations are presented.

Understanding the Advantages of Open Innovation Practices in Corporate
Wim Vanhaverbeke[1], Vareska Van de Vrande[2]
[1]*Hasselt University, Belgium*
[2]*Erasmus University, Netherlands*

Part of the advantages of using an open innovation (compared to closed innovation) in corporate venturing can be explained by applying the real options approach. Open innovation in risk-laden activities such as corporate venturing has the following advantages: i. benefits from early involvement in new technologies or business opportunities, ii. delayed financial commitment, iii. early exits reducing the downward losses, and iv. delayed exit in case it spins off a venture. We furthermore argue that these benefits do not automatically materialize. Innovation firms have to learn new skills and routines to develop the full 'real option'-potential of open innovation practices.

Session	Decision Analysis and Methods 4
Date	12/10/2008
Time	11:00 - 12:30
Room	Jupiter 1
Chairs	Abbas Toloie Eshlaghy, Min Wang

Rank Reversal in the PROMETHEE II Method: Some New Results
Bertrand Mareschal[1], Yves De Smet[1], Philippe Nemery[1]
[1]*Université Libre de Bruxelles, Belgium*

The aim of this paper is to study properties of multicriteria decision-aid ranking methods based on pairwise comparisons in regards to rank reversals. At first we introduce the notion of pair-wise rank reversal and we show that this notion is equivalent to rank reversal. Then we analyze more particularly the PROMETHEE II method and we clarify conditions under which the PROMETHEE II ranking might suffer from rank reversal problems. Finally, we prove that the PROMETHEE multicriteria net flow is the centered score that minimizes the sum of the squared deviations from the pair-wise comparisons of the alternatives.

A Decision Making Approach Based on Fuzzy Regression and Fuzzy Multiple Objective Programming for Advanced Manufacturing Technology Selection
Zeynep Sener[1], E. Ertugrul Karsak[1]
[1]*Galatasaray University, Turkey*

The use of advanced manufacturing technologies provides a great potential for improving manufacturing performance to compete in the global markets. This paper proposes a decision model based on fuzzy linear regression and fuzzy multiple objective programming for advanced manufacturing technology selection. Fuzzy regression is introduced in the model to assess the vagueness of functional relationships among decision variables and to account for inexact data. A flexible manufacturing system selection problem is presented to illustrate the application of the proposed decision methodology.

Newsvendor Problems with Interval Probabilities
Peijun Guo[1], Hideo Tanaka[2]
[1]*Yokohama National University, Japan*
[2]*Hiroshima International University, Japan*

In this paper, the uncertainty of the demand in newsvendor problems is characterized by interval probabilities. The characteristics of interval probabilities, the method for estimating interval probabilities from subject and decision criteria with interval probabilities are addressed. The newsvendor models under interval probabilities are proposed for obtaining the optimal order quantity.

A Group Decision Making Procedure for Fuzzy Interactive Linear Assignment Programming
Mahdi Bashiri[1], Hossein Badri[1]
[1]*Shahed University, Iran*

This Paper presents a new Decision Making tool when the decision data are not crisp data and the decision maker(s) want(s) to rank the alternatives during an interactive process. In this paper we propose an interactive method which uses qualitative data to calculate weights of criteria and rank the selected alternatives. Because of existence of linguistic terms in the decision matrix and the weight of each criterion, which can be expressed in trapezoidal fuzzy numbers, an Interactive Method is proposed for ranking of each alternative with proper weight for each criterion. By using the method, decision makers can provide and modify their preference information gradually within the process of decision making so as to make the decision result more reasonable. Finally a numerical example illustrates the proposed method.

Conceptual Design for Peristaltic Pump Based on TRIZ
Wei Liu[1], Xuan Liu[1], Runhua Tan[1], Guozhong Cao[1]
[1]*Hebei University of Technology, China*

Based on the research of relevant patents of peristaltic pump, several common problems and corresponding solutions in peristaltic pump design have been concluded. Furthermore we analyzed the patents with TRIZ, found out the stage of technology maturity of peristaltic pump and the lines of technological system evolution, then a clear design direction was showed up, the conceptual design has been made.

A Mean-Semivariance Model for Stock Portfolio Selection in Fuzzy Random Environment
Zhe Zhang[1], Jiuping Xu[1]
[1]*Sichuan University, China*

This paper discusses stock portfolio selection problem in fuzzy random environment. In the paper, the returns of each security are assumed to be fuzzy random variables, then following the ideas of mean-semivariance model in a fuzzy random environment is proposed. Based on the concept of semivariance of fuzzy random variable, a mean-semivariance model in is proposed. To solve the new model in general cases, a fuzzy random simulation based genetic algorithm is presented in the paper. Inaddition, a numerical example is presented to illustrate the proposed stock portfolio selection model and the effectiveness of the designed algorithm.

Session	Decision Analysis and Methods 5
Date	12/10/2008
Time	13:30 - 15:00
Room	Jupiter 1
Chairs	Yves De Smet, Vahid Ebrahimipour

Building an Effective ERP Selection System for the Technology Industry
Jia-Jane Shuai[1], C. Y. Kao[1]
[1]*Minghsin University of Science and Technology, Taiwan*

This paper models and analyzes the factors of Enterprise Resource Planning (ERP) system selection on the fast changing technology industry. With growing pressures for collaborative information systems partnerships, ERP system selection has been an important activity for improving supply chains efficiency in technology industries. However, ERP system selection is tedious and time consuming, and the criteria used for ERP evaluation are numerous and influence one another. In this paper, we explore the potential of applying the Decision Making Trial and Evaluation Laboratory (DEMATEL) approach. The DEMATEL not only can convert the relations between cause and effect of criteria into a visual structural model, but can also be used as a way to identify the key factors. A case study is used to illustrate the application of the proposed method.

R&D Project Portfolio Selection Model Analysis Within Project Interdependencies Context
Peng Guo[1], Junjun Liang[1], Yuming Zhu[1], Junfei Hu[1]
[1]*Northwestern Polytechnical University, China*

The existing models of R&D project portfolio selection considered rarely project interdependencies. This may make decision makers select wrong projects for the project portfolio. In general, project interdependencies include outcome, resource and technical interdependency. Considering three categories of interdependencies, a few researchers have developed a couple of project selection models which only determined one or two interdependencies. The paper puts forward four categories of project interdependencies: outcome, resource, technical and risk interdependency. A 0-1 nonlinear mathematic programming method base R&D project portfolio selection model is proposed, in which four categories of interdependencies and other conventional constraints are all considered. Finally, a numerical example is given to illustrate that this model is feasible and rather important for making the reasonable and right project portfolio selection decision.

Applying Fuzzy Linguistic Variable and ELECTRE Method in R&D Project Evaluation and Selection
Chen-Tung Chen[1], W. Z. Hung[1]
[1]*National United University, Taiwan*

In general, R&D project evaluation and selection is a group multi-criteria decision problem (GMCDM). There are many quantitative and qualitative factors will influence the R&D projects selection. A more realistic approach may be use linguistic assessments instead of numerical values to solve the problems. Therefore, decision-makers' opinions are described by 2-tuple linguistic variables which can be expressed in different types. In this paper, a transformation method will be presented to transform the non-homogeneous linguistic information to a standard linguistic term set. Then, a new decision method is proposed by combining 2-tuple linguistic variables with ELECTRE method to determine the ranking order of R&D projects.

Using Fuzzy DEMATEL to Develop a Causal and Effect Model of Hot Spring Service Quality Expectation
Chih-Cheng Chen[1], Ming-Lang Tseng[1], Yuan-Hsu Lin[1]
[1]*Ming-Dao University, Taiwan*

The evaluation service quality expectation criteria are usually evaluated in subjective and qualitative in nature described in linguistic information, it is very difficult for the customer to express the preferences using exact numerical values. This research applies a fuzzy DEMATEL method in linguistic information for group decision-making to gather group ideas and analyze the cause–effect relationship of complex social science problems in fuzziness environments. The detailed of the fuzzy DEMATEL in linguistic information procedures are presented. An empirical study with 265 respondents applies the fuzzy DEMATEL in linguistic information method to the evaluation of a hot spring hotel service quality perception in Taiwan. The results are discussed.

Facility Location Problem for Reconfigurable Manufacturing System with Multi-period Demand Changing
Donghwa Jeong[1], Yoonho Seo[1]
[1]*Korea University, South Korea*

In this paper, we focus on a new facility location problem, where the facility at each period can be reconfigured and closed or opened according to customer demand changing. For solving this problem, a mixed integer programming is developed and is programmed by Cplex 9.0. Instances are randomly generated to ensure multiplicity of experiment. To analysis the proposed model, experiments are performed with modification of the length of periods, number of objects, cost structure and customer demand, and results are analyzed.

Session	Project Management 1
Date	12/10/2008
Time	15:30 - 17:30
Room	Jupiter 1
Chairs	C.K. Kwong, Michael Ogembo Kachienga

Risk Control and Implementation Planning in IS Project
Jian Zhang[1], Suling Jia[1], Wenting Liu[2], Qiang Wang[1]
[1]*Beijing University of Aeronautics and Astronautics, China*
[2]*National University of Singapore, Singapore*

The cost and benefit of information system project are uncertain which brings high risk. Therefore, in order to carry out project planning under the pre-condition of controlling risk, it is important to identify the risk features of IS project. As a first step towards that goal, this article discusses the stochastic variations of cost and benefit of IS project and elaborates the mathematical description of them. Additionally, the risk-control model of IS project under uncertainty is built by applying dynamic programming. Finally, a project planning method considering appropriate risk-control with the time and cost limitation is proposed using integer programming method, whose feasibility and efficiency are validated by case study.

Managing Projects in Global Manufacturing Networks
Egon Mueller[1], Ralph Riedel[1], Marc Simon[1]
[1]*Chemnitz University of Technology, Germany*

In this paper the common standards of project management are discussed in the context of global manufacturing. In global manufacturing networks play a decisive role because the several activities of the value chain are distributed globally due to market, supply or cost issues. An extensive literature research shows that there is a need for incorporating human factors, especially cultural aspects, in the methodology for planning and control in international projects. Based on these theses some approaches are developed for the stronger consideration of culture in project management standards. The paper presents a completely new view on project management which will lead to a better understanding of intercultural projects and to an increase in the success rate of such projects.

The Effects of the Debt Financing Restriction in a Real Options Model
Michi Nishihara[1], Takashi Shibata[2]
[1]*Osaka University, Japan*
[2]*Tokyo Metropolitan University, Japan*

This paper derives the firm value and the investment strategy investment timing, debt financing, leverage, and endogenous default) when an entrepreneur makes a real investment with debt financing both in monopoly and in duopoly. In particular, we clarify the effects of the entrepreneur's financial constraint where a part of the investment cost must be financed by debt. The leverage and the credit spread of the constrained entrepreneur are higher than those of the unconstrained one. The investment timing of the constrained entrepreneur is later, which is consistent with the standard underinvestment theory. The financial restriction binds more tightly in duopoly than in monopoly. Surprisingly, however, in duopoly the financial constraint plays a role in moderating the preemptive competition and improving the firm value in equilibrium.

An Integrative Approach to Project Management in a Small Team Developing a Complex Product
Ronald Beckett[1]
[1]*University of Western Sydney, Australia*

This paper describes an approach to the management of a complex product/system development built around an interpretation of an ISO 9000 Quality Management System. One factor in making this choice was the orientation of the team towards excellence; others were the structure provided and the compatibility of the embodied Plan-Do-Check-Act cycle with the iterative developmental nature of the project. Some comparison is made with agile management ideas, and some knowledge management aspects of the project are discussed. It is noted that in this environment both people and structures are important, with traditional task management practices making a lesser contribution.

Exploring Impacts of Software Development Process Maturity on Project Risk
Chun-Hui Wu[1]
[1]*National Formosa University, National Yunlin University of Science & Technology, Taiwan*

The failure of IS projects is a common occurrence in many organizations around the world. One explanation for the high failure rate is that managers are not taking prudent measure to understand and manage the risks associated with IS projects. As organizations continue to invest substantial resources and efforts on IS projects, controlling the risks involved in such projects in order to increase their performance becomes critical. The Capability Maturity Model (CMM) is taken as a reference model for improving software development process maturity. Our study examined the impacts of software development process maturity level on project risk. A survey was conducted to the corporate IS managers and professionals in Taiwan. The results found that the more mature project's software development process should reduce project risk level.

A Fuzzy BOT Project Risk Evaluation Model in Iranian Power Plant Industry
Sadoullah Ebrahimnejad[1], S. M. Mousavi[2], S. M. H. Mojtahedi[2]
[1]*Islamic Azad University Karaj Branch, Iran*
[2]*Islamic Azad University South Tehran Branch, Iran*

Nowadays the most common approaches for project financing is called BOT (Build - Operate - Transfer). One of the most practical financing infrastructure by private capital, in which governmental strategic control is preserved. In spite of this advantage, BOT projects may be so riskful for private and public sectors. Therefore, risk identification and management is so important in BOT projects. In this paper, at first we identify some of the most important risks in BOT power plant projects; then we use some effective criteria and attributes assigned for risk evaluating in BOT approach. Afterwards the problem is defined via fuzzy Multi Attribute Decision Making (MADM) method. Therefore, a fuzzy LINMAP method is presented to evaluate the risk in BOT projects. Finally, a case study is used to illustrate the procedure of the proposed model at the end of paper.

Telecommunications Project Management – A Holistic Approach for Operations-Related Services
Thomas Frisanco[1], Norbert Anglberger[2], Rachel Ang[3], Stephen Onu[4]
[1]*Detecon International, Germany*
[2]*Siemens AG, Germany*
[3]*Ernst & Young, Germany*
[4]*Booz Allen Hamilton, United States*

Telecommunications industry is undergoing a rigorous paradigm shift and value migration from equipment sales towards operations related services, providing long-term, ongoing operations rather than one-time deployment and commissioning. With project complexity and lifetime constantly increasing, the nature of contracting and vendor-operator partnership changes. Research explores the degree to which executive sponsors' role and influence in the planning phase of the service project management lifecycle contribute to project performance. Organizations are embracing concepts of formal project management as a critical element of their organizational structure to increase efficiency, adopting dedicated service project management concepts to improve customer relationship and reduce non-conformance costs, and integrating the concept of the "implementation-oriented sales process", which provides a better basis for closing long-term, stable and profitable operations services transactions. In this paper, we propose a holistic approach to operations project management with the goal to reduce economic losses, improve resource allocations, and advance organizational learning.

Session	Supply Chain Management 1
Date	12/10/2008
Time	11:00 - 12:30
Room	Jupiter 2
Chairs	Flavio Fogliatto, Thomas Frisanco

Development of a Methodology to Improve the Source Process
Felix Wriggers[1], Philip Fronia[1], Sebastian Beck[1], Peter Nyhuis[1]
[1]*Leibniz University Hannover, Germany*

Companies have to satisfy a multitude of needs to thrive. Ensuing conflicts between targets have to be resolved in order to maximize the companies' market value, the decision field being of high complexity. On a regular basis decision makers have therefore to answer questions regarding the companies' performance in comparison to competitors and have to identify the part of their company in which strategic measures will exhibit the greatest impact on market value. Another strategic decision is to determine the measures to be implemented and how these will affect their companies' market value. Some methods existing today offer useful input to resolve this decision problem or at least parts thereof. Nevertheless several consulting projects for German companies completed by the authors ascertained demand for an easy to use decision support system which targets this optimization problem. This paper describes an easy to use decision support system for sourcing, which was successfully applied to resolve this problem, using an adaptation of SCOR as a basis. Ongoing research work to enhance this tool is described.

Analysis of an Inventory Model in Subscription-Based Rental Service with Two-Classes of Customers
Aussadavut Dumrongsiri[1], Apurva Jain[2], Kamran Moinzadeh[2]
[1]*Sirindhorn International Institute of Technology, Thammasat University, Thailand*
[2]*University of Washington, United States*

The paper offers a model and analysis of the rental process at a subscription-based business like Netflix. We analyze a priority scheduling scheme, currently in use, that gives priority to light renters over heavy renters and show that, in some situations, it may be more profitable for the firm to give priority to heavy renters. The optimal initial inventory decision is found for a simplified cases. Extensions are briefly discussed.

Inventory Management Performance in Indian Machine Tool SMEs: What Factors Do Influence Them?
N. Rajeev[1]
[1]*Indian Institute of Science, India*

These instructions give you basic guidelines for preparing papers for the IEEM 2008 Proceedings. Inventory Management (IM) plays a decisive role in the enhancement of efficiency for manufacturing enterprise competitiveness. Therefore, major manufacturing industries are following inventory management practices as a strategy to improve efficiency and achieve competitiveness. However, the spread of inventory management culture among Small and Medium Enterprises (SMEs) is limited due to lack of initiation, expertise and financial limitations in developed countries, leave alone developing countries. With this backdrop, this paper makes an attempt to ascertain the factors which influence the IM performance of SMEs in the machine tools industry of Bangalore, India. This issue is probed based on primary data gathered from 91 SMEs. The paper brings out that two sets of factors namely organizational support and external pressure have a positive impact on the inventory performance of SMEs.

A Feed-Back Model of Control Chart for Supplier
Jing Sun[1], M. Matsui[1]
[1]*The University of Electro-Communications, Japan*

In the supply chain system, prompt response of supplier to the feed-back trouble from the maker is important, and has become a key point of the supplier competitive edge. In the setting of the due time of the treatment to the various assignable causes, because idle cost and delay cost are the trade-off relation, setting the optimal due date becomes an important problem to the supplier. On the other hand, recently, to improve supplier quality, there has been an increased interest in IT (information technology) control charts which are used to monitor online production processes. To resolve the above problem, in this paper, first, a feed back model of control chart is proposed for supplier. Then, the cost elements of the feed-back case are analyzed and the mathematical formulations which correspond to the case are shown. Finally, to clarify the trade-off relation, the behaviors of idle and delay costs are studied. In addition, the setting of the optimal due time is discussed in detail.

Optimal Retail Shelf Space Allocation with Dynamic Programming using Bounds
Hasmukh Gajjar[1], Gajendra Adil[1]
[1]*Indian Institute of Technology-Bombay, India*

Efficient shelf space allocation increases profitability of a retail store and thus provides competitive advantage to the retailer. Several shelf space allocation models exist in literature. However, these models are generally solved using heuristic approaches due to NP-hard nature and there is a need to develop exact methods. In this paper, we present a non-linear shelf-space allocation model (NLSSAM) and optimally solve it with a new dynamic programming (NDP) using bounds which fathoms unpromising states. It is found from experimental studies that NDP using bound was much more efficient to solve large problems as compared to original dynamic programming (ODP) without using bound. ODP could not solve all problem instances of problem sizes (number of products, n = 30 and 40) within specified CPU time limit of 400 seconds while NDP could solved problem instances of size (n = 200) with average CPU time of 7.89 seconds.

Part Based Decentralized Information Handling for Process Improvements along the Supply Chain
Matthias Schmidt[1], Wiebke Hartmann[1], Peter Nyhuis[1]
[1]*Leibniz University Hannover, Germany*

"Gentelligence®" is a neologism which consists of the two words "genetic" and "intelligent". Gentelligent® Parts are basically components which are able to save information. The special and specific property is that they have both the ability to save and store information and to handing it over to the next component generation. Lifecycle information is saved in a continuous process. Due to these characteristics, Gentelligent® Parts can serve as a decentralized Enterprise Information System (EIS). As a result, it is possible to identify extensive potential for improving logistic and technical processes arising along the product evolutionary process and during the usage phase. This article provides insight into both the principle of Gentelligent® Parts as well as the corresponding data structure and targeted process improvements.

Session	Supply Chain Management 2
Date	12/10/2008
Time	13:30 - 15:00
Room	Jupiter 2
Chairs	Alireza Haji, Ana Paula Barroso

Lead Time and Inventory Decisions in a Push-and-Pull System
He Xu[1], Xiang Zhu[2], Liming Liu[3]
[1]*Huazhong University of Science and Technology University, China*
[2]*Hong Kong University of Science and Technology, Hong Kong*
[3]*Hong Kong Polytechnic University, Hong Kong*

This paper studies the design and control issues of a two-stage push-and-pull system with lead-time quotation and stock decisions. To evaluate the performance of different designs of the system, we construct a decision model to minimize holding costs of the semi-finished product and the finished product, the late delivery cost, and customer waiting cost by optimizing base-stock level of the semi-finished product and the quoted lead time. By using a constant service time at the push stage as a benchmark, we provide explicit formulas and accurate heuristics to compute and approximate the optimal solutions for various system settings. Moreover, we demonstrate the impact of the uncertainty of the push stage on the system design.

Channel Coordination under Price Protection
Zhe Zhang[1]
[1]*Fudan University, China*

In current market competition companies face with short product life cycle, high demand uncertainty and drastic declines of product values. This study analyses the price protection policy in channel coordination and proposes a two-period dynamic model of optimal price protection rate based on the single ordering. The result shows that, through setting reasonable the wholesale price and the price protection rate, optimal order quantity by the retailer can be achieved. Furthermore, The policy optimizes the total benefit of channel alliance to obtain the win-win pattern, and finally realize channel coordination.

Dual Sourcing Strategy in Mass Customized Manufacturing
Kristianto Nugroho Yohanes[1]
[1]*University of Vaasa, Finland*

This paper studies dual sourcing strategy in mass customized manufacturing for two differentiable products. The supplier's collaboration is represented by two stages game to optimize price and capacity decision and the buyer-suppliers collaboration is represented by joining the profit optimization. In order to mitigate the demand uncertainty effect, the long term decision is taken into consideration. The results show that it is possible to the suppliers to involve at higher level of cooperation by considering rewards and punishment from the buyer, which means it is possible to apply outsourcing to strategic items. The final part of the paper concludes the results and outlines future research directions.

Carbon Market Sensitive Green Supply Chain Network Design
Amar Ramudhin[1], Amin Chaabane[1], Mourad Kharoune[1], Marc Paquet[1]
[1]*École de Technologie Supérieure, Canada*

This paper introduces a mixed integer mathematical model formulation for the "Carbon-Market Sensitive - Green Supply Chain Network Design" problem (CMS/GSCND) where carbon trading considerations are integrated within the supply chain network design phase. The solution methodology allows the evaluation of different strategic decisions alternatives, such as supplier and subcontractor selection, product allocation, capacity utilization, and transportation configuration, and their impact in terms of carbon footprint. This new formulation provides decision makers with the ability to understand the trade-offs between total logistics costs and the impact of greenhouse gases reduction. It also allows offsetting the latter through both supply chain reengineering and carbon trading. Model validation, results, and extended analysis are demonstrated via a numerical study.

A Model to Quantify the Bullwhip Effect in Systems with Stochastic Demand and Lead Time
Jose Carlos Fiorioli[1], Flavio Fogliatto[1]
[1]*Federal University of Rio Grande do Sul, Brazil*

The increase in demand variability as information flows from customers to manufacturers in a supply chain is known as the Bullwhip Effect (BE). Modeling this phenomenon is key in measuring its intensity, aiming at reducing its negative impact on both service and inventory levels in supply chains. This paper proposes a new, more precise mathematical model for quantifying the BE in systems with stochastic demand and lead time. The new model takes into account the lead time variability. In addition, the model allows a more precise assessment of the role that the demand's coefficient of variation plays when quantifying the BE. The use of the proposed model may enable an improved management of the supply chain by attenuating the propagation of the BE.

Impact of Channel Power in the Supply Chain Context - An Empirical Study on Taiwan Apparel Industry
Chang-Hsien Hsu[1], Yung-Hsin Chen[1], Shuo-Chang Tsai[1], Chi-Yuan Chen[1]
[1]*Asia University, Taiwan*

To pursue the optimal operations performance and profitability of their own, channel members in a supply chain tend to manipulate the channel power to serve the purpose. It inevitably evokes the problems of channel conflict and leverage situation within the supply chain power regime. We employ French and Raven's approach on power sources along with Gaski's power and conflict theory and Howell's model to construct the hypotheses and allow the method of structure equation modeling (SEM) for path analysis. The objective is to explore how different power sources interwoven with economic or non- economic impact will interrelate to the channel power and downstream members' satisfaction in the Taiwan apparel industry. The outcome of this study provides an insight into how channel members take the advantage of channel power in favor of their operations performance.

Session	Supply Chain Management 3
Date	12/10/2008
Time	15:30 - 17:30
Room	Jupiter 2
Chairs	Yung-Hsin Chen, Sun Jing

A Multi-Agent Based Combinational Auction Model For Collaborative e-Procurement
Shanshan Wang[1], Heqing Song[1]
[1]*Zhejiang Gongshang University, China*

Collaborative e-procurement has been considered as a vital link in many world-class supply chain strategies. Most of the previous related studies just covered the purchasing of distinct items. However, each buyer may have the purchase needs for multiple heterogeneous items at the same time. Therefore, in this research, we address a multi-agent based combinatorial auction model for collaborative e-procurement as a new business model that combines the strength of the combinational auction and the benefits of collaborative e-procurement. A representative combinatorial auction based collaborative e-procurement (CACP) process is presented, then, the system architecture and optimized bid selection modeling for CACP are described. Finally we show the viability of CACP through proof-of-concept prototype experiment results.

Fuzzy Logic Supply Chain Agility Assessment Methodology
Nazanin Pilevari[1], S. M. Seyed Hosseini[1], Javad Jassbi[1]
[1]*Islamic Azad University Science & Research Branch, Iran*

Supply Chain Agility Assessment has been considered as a number one issue in world class manufacturing research study. The environmental issue as well as speed, verity, flexibility and integration in production line come along with customer relationship and mass customization concept should come to light in today's research study. To achieve the competitive edge, companies must align with suppliers and customers to streamline operations, as well as agility characteristic beyond individual companies. Consequently agile supply chain (ASC) is considered as a dominant competitive advantage, however so far a little effort has been taken to build ASC assessment methodology in recent years. Therefore, due to ambiguity of agility assessment, we construct a fuzzy rule based system, considering agility capabilities such as Responsiveness, competency, flexibility and Quickness to evaluate agility in supply chains. This evaluation helps managers to perform gap analysis between existence agility level and the desired one.

TOPSIS for Solving Multi-Objective Multi-Product Supplier Selection Problem under Price Breaks
Omid Jadidi[1], Sai Hong Tang[1], Fatemeh Firouzi[1], Yusof Ismail[1]
[1]*University Putra Malaysia, Malaysia*

Supplier selection is a multi-criteria decision-making problem (MCDM) that is affected by quantitative and qualitative criteria. In these problems if buyer wants to buy multiple products and also suppliers offer quantity discounts, this problem becomes more complicated. To solve the problem, an integration of Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) and multi-objective mixed integer linear programming (MOMILP) is used to consider both tangible and intangible factors in choosing the best suppliers and define the optimum quantities among selected suppliers. The problem includes the three objective functions: to maximize the total value of purchasing (TVP), and to minimize the total cost and total defect rate, while satisfying capacity and demand requirement constraints. In order to solve the multi-objective problem, TOPSIS and further a single objective function are used to consider the relative importance of the three goals.

A Special Discount Strategy for Supplier Selection and Order Allocation
Omid Jadidi[1], Sai Hong Tang[1], Fatemeh Firouzi[1], Rosnah Binti Mohd. Yusuff[1], Yusof Ismail[1]
[1]*University Putra Malaysia, Malaysia*

In this paper, we consider a special discount where special products' sales volume affects the prices and discounts of the other products. In this circumstance, that the buyer wants to buy multi-product and also suppliers offer the special discount, the problem becomes more complicated. To solve the problem, multi-objective mixed integer linear programming (MOMILP) is used to define the optimum quantities among selected suppliers. The problem includes the three objective functions: to minimize the inverse total value of purchasing (TVP), and to minimize the total cost and total defect rate, while satisfying capacity and demand requirement constraints. In order to solve the problem, a single objective function is proposed to consider relative importance of the goals. A numerical example is given to illustrate how the model is applied.

Green Supply Chain: How Does It Affect Current Supply Chain Practice?
Qing Lu[1], Wenkai Li[1], Balan Sundarakani[1], Shun Cai[1], Robert De Souza[1], Mark Goh[1]
[1]*The Logistics Institute-Asia Pacific, National University of Singapore, Singapore*

With the growing awareness of human activity on global climate change, the pricing of carbon emissions would inevitably become reality in Asia as it is in Europe. This paper critically analyzes the possible environmental challenges on supply chain management at the strategic level and the possible paradigm shift. We investigate how environmental factors such as carbon emission affect the supply chain architecture and change its landscape. We predict that green supply chain would bring a paradigm shift in supply chain management. Higher level of horizontal integration is expected to see among suppliers, manufacturers and logistics service providers, and geographically the supply chain would start to contract after the ruthless expansion in past two decades. These predictions would help manufacturers, suppliers, and logistics service providers adjust their supply chain strategies in this shift.

A Study of Markdown Policy in Aggregate Production Planning Environment by Developing a APP-MP Model
William Chung[1], Wenyun Zhu[1]
[1]*City University of Hong Kong, Hong Kong*

It is believed that the information sharing and cooperation between the retailer and the manufacturer become important now for improving their performance. This paper is to study the significance of the cooperation between the markdown policy and the aggregate planning so as to simulate the cooperation between retailers and manufacturers by a new model, Aggregate Production Planning-Markdown Pricing Model (APP-MP) which is established by integrating the markdown model into Aggregate Production Planning model. The APP-MP is a nonlinear integer programming model which is able to help the retailer and the manufacturer simultaneously make the pricing decisions, including the magnitude and time of markdown, and operational decisions so that greater profits could be obtained. The example solution shows that the cooperation definitely increases the profits. This paper's result also implies that, instead of holding the belief "selling more and earning more", the retailer could cooperate with manufacturer to plan the production and earns more.

A Study for Optimizing the Reading rate of RFID Tagged Cartons in Palletizing Process
Chiao Tzu Huang[1], Li-Wen Lo[1], Wei-Ling Wang[1], Hsin-Lin Chen[1]
[1]*National Chin-Yi University of Technology, Taiwan*

In the advanced Supply Chain/Logistic system, RFID system adapts the radio waves to scan and record the data received from RFID tags. The RFID readers can be placed up to a few meters away from RFID tagged objects. According to the investigation conducted by EPCglobal, the readers are still unable to achieve 100% reading rates, and it means the Wal-Mart and its suppliers could not reach complete reading rate in the process of commodity transaction. This study adopts the Taguchi Method and selects major controllable factors, for example distance, placement of RFID tag, and direction of RFID antenna, all possible factors are adopted in this study. The results show the reading rate of RFID system is mainly affected by relative positions of RFID tags and RFID antenna. In the final, a standard model will be initiated for RFID system, and this systematic arrangement would insure to optimize the reading rate of palletizing process.

A Multi-Sourcing Model from a Cost Heterogeneous Supply Base
Jishnu Hazra[1]
[1]*Indian Institute of Management Bangalore, India*

In this paper we analyze a scenario where a buyer procures capacity from one or more suppliers in the presence of demand uncertainty. The buyer does not have information of suppliers' production cost function but assumes it is sampled from a known probability distribution. The supplier, of course, has knowledge of its own cost function but like the buyer does not have information on other suppliers' cost function. Under this scenario we explicitly derive suppliers' capacity reservation price, which is a function of their capacity, amount of capacity reserved by the buyer and other parameters. The buyer's decisions are how much capacity to reserve and from how many suppliers. Under certain conditions we develop solutions and show that the model is robust to the number of suppliers from whom capacity is procured through reservation. When the parameters of demand distribution changes the supply base is likely to remain more or less the same.

Session	Facilities Planning and Management
Date	12/10/2008
Time	11:00 - 12:30
Room	Jupiter 3
Chairs	Sydney Chu, Mahadev Talawar

Location Selection Based on AHP/ANP Approach
Chang-Lin Yang[1], Shan-Ping Chuang[2], Rong-Hwa Huang[1], Chia-Chi Tai[1]
[1]*Fu Jen Catholic University, Taiwan*
[2]*Huafan University, Taiwan*

Facility location decisions are a key element in any company's overall strategic plan. The objectives include producing a product or providing a service at lower cost, at higher quality, or using the least amount of resources. Many studies have proposed models, principles, and criteria to evaluate and select the best location. This study proposes a AHP/ANP based measurement model for evaluating location characteristics in order to help managers to realize the advantages and disadvantages of potential location. The analytical hierarchy process (AHP) and the analytical network process (ANP) are utilized to determine the weight of each criterion when generating the selection model. Finally, this study uses a data sample to verify the feasibility of the evaluation model.

Fuzzy Multi Criteria Decision Making Method for Temporary Storage Design in Industrial Plants
Mojtaba Heydar[1], Reza Tavakkoli-Moghaddam[2], S. M. Mousavi[1], S. M. H. Mojtahedi[1]
[1]*Islamic Azad University South Tehran Branch, Iran*
[2]*University of Tehran, Iran*

The conventional approaches to temporary storage problem tend to be less effective in dealing with the imprecise or vagueness nature of the linguistic assessment. Under many situations, the values of qualitative criteria are often imprecisely defined for the decision makers. The aim of the paper is to solve temporary storage problems using MODM. In this paper, we use an applicable solution for selecting a temporary storage location among potential candidates' locations. There are two main steps in this study; first, locations are considered as alternatives which their weights are calculated by using fuzzy TOPSIS with considering flexible attributes. Then, in second steps, three objectives are defined as; 1) Maximizing alternatives weights summations; 2) minimizing alternatives distances summations to production departments; and 3) minimizing the quantity of temporary storage. Furthermore, quantitative and qualitative attributes are considered in this paper simultaneously. The proposed MODM is solved by using a Goal Programming (GP) approach. Empirical results show that the proposed method is viable approach in solving a temporary storage problem.

The Fragmented Warehouse: Location Assignment for Unit-load Picking
Stephen Ho[1], Sanjay Sarma[1]
[1]*Massachusetts Institute of Technology, United States*

In traditional warehouses, all items of the same stock-keeping units (SKUs) are usually co-located. However, the emergence of automatic identification and tracking technologies like RFID, enables us to consider free-form storage. We consider the strategy of storing identical items in a fragmented manner. The storage of identical SKUs in different locations creates new optimization opportunities by enabling more numerous picking route choices beyond standard unique location sets. Multiple storage location problems are not as well understood as the co-located storage case, and the complexity is greater. We present an abstract warehouse model to explore the storage location assignment problem in warehouse systems involving unit-load order picking and illustrate how multiple copies of items affect optimal location assignment. We introduce a provably optimal strategy involving a concept called "order pressure." We provide an optimal arrangement method for unit-load pick-orders and show how relative item probabilities affect clustering and distribution.

Establishing Work Design Criteria through a Highest Expected Utility Neural Network Model: An Automotive Trim Case Study
Rolando Quintana[1], Mark Leung[1]
[1]*University of Texas at San Antonio, United States*

The purpose of this research is two-folded. First, it attempts to maximize productivity and yield as well as to minimize the spatial fixed cost through the development of a work design decision making tool for optimizing work cell configurations and ergonomics. Second, the case study applies influence diagram and neural network to analyze and evaluate work/process design criteria. Practically, the industrial problem is to compare the new stand-up sewing cells against the traditional sit-down sewing layout while taking into consideration of ergonomic effect (repetitive motion injury (RMI) likelihood), floor space (SF), yield (%), and cost ($). The work design decision making tool used in the current study is based on influence diagram run on the HUGIN neural network software. Statistical tests are used to benchmark and validate the experimental results and actual data. Findings suggest that neural network is an effective alternative in solving work design problem.

A Mathematical Programming Method for Flow Path Design in High-mix and Low-volume Flow Manufacturing
Yunfang Peng[1], Zailin Guan[1], Li Ma[1], Chaoyong Zhang[1], Peigen Li[1]
[1]*Huazhong University of Science and Technology, China*

For the operation and control of flow manufacturing in a high-mix and low-volume production environment, a method of flow path management is introduced. It involves the dynamic formation and control of adaptable flow paths corresponding to different product families. A mathematical programming approach is presented for the design of flow paths, which takes into consideration the sharing of machines among various product families. The objective is to maximize the throughput in a predefined planning period and to minimize the number of shared machines. An illustrative example is given for demonstrating the use of the proposed method.

A Paradigm for Group Technology Cellular Layout Planning in JIT Facility
Mark Leung[1], Rolando Quintana[1], An-Sing Chen[2]
[1]*University of Texas at San Antonio, United States*
[2]*National Chung Cheng University, Taiwan*

A commonly examined domain associated with Just-In-Time (JIT) manufacturing is the implementation of Group Technology (GT), which requires identification of part families and machine groups in order to exploit similarities and achieve economies in manufacturing. One of the issues is how to design an effective layout which promotes the benefits of JIT cells. We present a procedure to design the layout of manufacturing cells operating within a GT environment. The approach, which can be easily adopted by practitioners, translates information such as processing requirement of parts, demand volume, and machine capacity into a material flow matrix. With an initial layout plan generated by assigning machines on a spacefilling curve, the cellular layout problem is solved by CRAFT. Using this procedure, we can recursively create a number of layout designs. A "gauge" measure indicating the intensity of material flows is also provided to assist managers in selecting desirable floor plan.

Session	Manufacturing Systems 1
Date	12/10/2008
Time	13:30 - 15:00
Room	Jupiter 3
Chairs	Iraj Mahdavi, Jiafu Tang

Congruence between Competitive Priorities and Manufacturing Decisions: An Exploratory Study
Sanjay Choudhari[1], Gajendra Adil[2], Usha Anantha Kumar[2]
[1]*National Institute of Construction Management and Research, Indian Institute of Technology-Bombay, India*
[2]*Indian Institute of Technology-Bombay, India*

This paper studies the choices or settings of the continuous production system in each manufacturing decision area using data collected through structured questionnaire from twenty executives working in manufacturing plants. It also investigates how choices made in manufacturing decision areas impact competitive priorities. In general, plants use different settings and in cases where same settings are used, they seem to deviate from ideal choice (for continuous production system) reported in literature. Further, it is observed that some settings improve multiple competitive priorities while others show trade off among competitive priorities.

Lean Manufacturing - a Practitioner's Perspective
Sachpreet Singh Aulakh[1], Janpreet Singh Gill[1]
[1]*RIMT-Institute of Engineering & Technology, India*

The paper attempts to present the big picture of lean consisting of thought process behind lean rather than just a smaller view concentrated on lean tools only. Importance of five elements of lean is discussed to appreciate the synergetic effect of each element on other towards making an organization lean. Further, a case study on lean manufacturing implementation experience of an Indian manufacturing firm is presented. It has been attempted to present lean manufacturing from a practitioner's perspective.

Managing Product Development Complexities through Restructuring Information Exchange and Adopting Configuration Principle
AHM Shamsuzzoha[1], Petri Helo[1], Tauno Kekäle[1]
[1]*University of Vaasa, Finland*

Increased customer demands and stiffer competition forcing manufacturing firms to rapid develop and deliver their products to the markets. Modern products are also become increasingly complicated and incorporating many newer technologies. To comply with these complexities, firms need to harness better ways to tackle the product development (PD) processes. Steps towards faster information exchange and adopting configuration principle could triggers to reduce these complexities. In this paper, generalized concepts and applicability of matrix based tools such as; design structure matrix (DSM), domain mapping matrix (DMM), multi-domain matrix (MDM) are discussed along with the effectiveness of configuration principle. Two examples are presented in order to demonstrate the usefulness and practicality of matrix based tools and configuration scenarios in PD processes.

A Multi-plant Tolerance Allocation Model for Assembled Electronic Products
Feng-Yi Huang[1], Yuan-Jye Tseng[1]
[1]*Yuan Ze University, Taiwan*

To produce an assembled electronic product, the components are manufactured with certain manufacturing operations and then assembled with the required assembly operations. In the manufacturing operations, each component must be manufactured within the allocated working tolerances such that the assembly operations can be performed to build the final product. In a collaborative manufacturing system, the components are assigned to the available manufacturing operations with different tolerance and cost characteristics at different plants. In this research, a multi-plant tolerance allocation model for assembled electronic products is presented. Firstly, given the blueprint dimensions and tolerances of a product, a tolerance allocation model is presented to determine the working tolerance of each of the components to maximize the cumulative sum of the working tolerances. Finally, a mathematical programming model is presented to assign the components to the suitable plants with minimized multi-plant manufacturing costs. An example product is tested and illustrated.

Application of Modular Fixture Elements Library cross Platforms Based on Tabular Layouts of Article Characteristics and XML
Jin Cai[1], Guolin Duan[1], Xu Zhang[1], Han Cui[1], Tao Yao[1], Xuebin Chen[1]
[1]*Hebei University of Technology, China*

Computer-aided fixture design (CAFD) system is usually developed at a special CAD platform, which limits the data exchange between different CAD systems. How to transform data in modular fixture (MF) elements library of CAFD system from one CAD system to another is focused on in this paper. The tabular layouts of article characteristics (SML)-based method is adopted in the following ways: firstly, the key data of MF elements are described, the master model made up of geometry model and SML then can be formed, variant design can also be realized based on the master model. Secondly, mapping is realized between SML and XML. All above researches provide an efficient factor for XML-based data cross platforms. Finally, an example is illustrated to provide a powerful proof for CAFD systems' application in diverse CAD systems.

A Systematic Approach in Shoe Last Design for Human Feet
Chung-Shing Wang[1], Teng-Ruey Chang[2], Ming-Ching Lin[1]
[1]*Tung-Hai University, Taiwan*
[2]*Nan-Kai University of Technology, Taiwan*

The main purpose of this research is to build a process to find the most suitable shoe last for making shoes for human feet. A fitness function is defined to determine the optimum shoe last. Based on reverse engineering (RE) technology, this research scanned the surface of human foot and shoe last in STL (Stereo Lithography) format. We proposed the STL feature-based slicing algorithm to automatically construct the three most important girth characteristics for human feet and shoe last. Fuzzy theory was used to analyze and build the membership functions of these three important characteristics between the shoe last and human feet. The analytical hierarchy process (AHP) was applied to compare the important index and decide the weighting functions for each girth characteristic to determine the fitness function in all shoe last databases for the feet.

Session	Manufacturing Systems 2
Date	12/10/2008
Time	15:30 - 17:30
Room	Jupiter 3
Chairs	Enrico Vezzetti, Roger Jiao

ART Based Cell Formation Using Combined Operation Sequence and Time

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[2]*Indian Institute of Technology, Kharagpur, India*
[3]*Kalasalingam University, India*

The cell formation (CF) problem mainly deals with clustering of parts into part families and the machines into machine cells. The parts are grouped into part families based on similarities I their manufacturing and design attributes and the machines are allocated into machine cells to produce the identified part families. The zero-one part-machine incidence matrix is commonly used as input to any clustering algorithm. The output is generated in the form of block diagonal structure. Production data such as operation time, sequence of operations, batch size etc. that have significant bearing on smooth flow of materials are not considered in such methods. In this paper, an attempt has been made to develop an algorithm based on Adaptive Resonance Theory (ART) neural network to addresses this issue by considering combination of operation sequence and operation time of the parts to enhance the quality of the solution obtained for the CF problem. A new performance measure is proposed to assess the goodness of the solution quality obtained through proposed algorithm. The performance of the proposed algorithm is tested with example problems and the results are compared with the existing methods found in the literature. The results presented clearly shows that the performance of the proposed algorithm is comparable with other methods for small size problems and better for large size problems.

A Genetic Approach to Solving a Hybrid Flow Shop Scheduling Problem

Iraj Mahdavi[1], Salim Mojarad[1], Babak Javadi[1], Ali Tajdin[1]
[1]*Mazandaran University of Science & Technology, Iran*

In this paper, we address the problem of scheduling n jobs in an s-stage hybrid flowshop with batch production at the last stage with the objective of minimizing a given criterion which consists of three parts: the total weighted earliness, the total weighted tardiness and the total weighted waiting time. The batch production under our study is referred to as serial batches. To solve the problem we proposed an efficient GA approach.

Integrated Quay Crane and Yard Truck Schedule for Inbound Containers

Der-Horng Lee[1], Jin Xin Cao[1], Qi Xin Shi[2]
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[2]*Tsinghua University, China*

Quay crane scheduling a yard truck scheduling are two important subproblems in container terminal operations, which have been studied separately in previous research. This paper treats the scheduling of quay crane and yard truck in a whole. The problem is formulated as a mixed integer programming model and solved with a genetic algorithm. Computational examples show the benefits of integrated methods and the efficiency of the proposed algorithm.

Solving a New Mathematical Model for Cellular Manufacturing System: Fuzzy goal Programming

Mohammad Mahdi Paydar[1], Iraj Mahdavi[2], Maghsud Soleimanpur[3], Ali Tajdin[2]
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[2]*Mazandaran University of Science & Technology, Iran*
[3]*Faculty of Engineering, Urmia University, Iran*

A fuzzy goal programming based approach is taken to solve an extended multi-objective mathematical linear programming model to handle two important problems in cellular manufacturing systems simultaneously: Cell formation and layout design. The advantages of proposed model are considering the machine's costs, inter-cell, intra-cell (forward and backward) material handling, operation sequence and resource constraints in machine capacity. To illustrate the applicability of the proposed model, an example has been selected and computational results are presented.

Background Analysis for the Application of EOQ Model in a Three-stage Steel Roller Production System with Deterministic Demands and Returns

Yang Liu[1], Jiafu Tang[1], Richard Y.K. Fung[2]
[1]*Northeastern University, China*
[2]*The City University of Hong Kong, Hong Kong*

Facing increasing market competitions, more manufacturers opt to incorporate remanufacturing into their production system in order to alleviate pressures due to increasing raw material price. The management of inventories in the production system becomes more complex when manufacturing and remanufacturing take place simultaneously. It is essential to find a way to decide when remanufacturing should starts and stops at a lower cost. This paper introduces a manufacturing/remanufacturing system with multiple serviceable inventories and multiple recoverable inventories in a steel roller producing process. By considering manufacturing and remanufacturing in the different stages, three modes of production are identified. Then, the inventory profiles in the system are studied to make preparation for the application of EOQ model in the steel roller production process to decide the optimal order quantities and the optimal order time between various serviceable inventories with the view of minimizing the average cost.

Cycle Time Reduction in Assembly and Test Manufacturing Factories: a KPI Driven Methodology

Li Zheng[1], Jing Xiao[1], Forest Hou[2], Wei Feng[1], Na Li[1]
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[2]*Intel (Pudong) Corporation, China*

In this paper we will introduce a new cycle time performance tracking matrix derived from the factory physics queuing model. We will explore a systematic way to structure the hierarchical cycle time key performance indicators (KPI) framework and also to define the right owner to improve those measurements. We will extend the discussion to some control and improvement methods, in particular, CONWIP release control management, a First In First Out (FIFO) dispatching automation tool and the use of Value Stream Mapping (VSM) to reduce factory variability. These tools and methods lead to great benefits to the factory cost saving.

Flexible Job Shop Scheduling Problem Solving Based on Genetic Algorithm with Model Constraints

Xuan Du[1], Zongbin Li[1], Wei Xiong[1]
[1]*Xi'an Jiaotong University, China*

An improved genetic algorithm (GA) is presented to solve Flexible Job Shop scheduling (FJSS) problem. This algorithm combines GA with constraint model based on polychromatic sets theory (PST). According to the characteristic of FJSS problem, this algorithm uses contour matrix to formalize the restrictions between work-piece and operations, and between operations and machines. During the process of encoding, decoding, crossover and mutation, the contour matrixes guarantee the genetic searching in the valid solution space. At the same time, the calculation of fitness value is simplified and the computer programming is easy developed. The disadvantage of traditional GA that is the premature convergence and slow convergent speed are improved. Experimental results demonstrate that this algorithm is very stable and its efficiency is improved. It is fit for solving FJSS problem and dynamic scheduling problem.

An Intuitive Framework to Automate Feature-Rich Manual Tasks and Manufacturing Processes

Ioannis Georgilas[1], Vassilios Tourassis[1]
[1]*Democritus University of Thrace, Greece*

The common image of manufacturing today is that of an industry dominated by automation. Yet manual labor is still used in a large variety of difficult tasks that combine precision and accuracy with sophisticated cognition. The market demands for higher production rates while maintaining quality levels, are forcing the conversion of the remaining manual tasks to automated ones. While this process is industry-specific, there is a need to convert the manual tasks into automatic ones in a systematic way. Based on a spray-enameling example from the sanitary ware industry, we develop an intuitive framework that can assist production engineers in automating feature-rich tasks and processes.

Session	Engineering Education and Training
Date	12/10/2008
Time	11:00 - 12:30
Room	Mercury 1
Chairs	Amnon Gonen, Jindong Li

Social Intelligence in Digital Library Guide Designers
Hsing-yu Hou[1], Tung-Hsu Hou[2], Hui-Jiun Hu[2]
[1]*National Yunlin University of Science and Technology, Taiwan*
[2]*Transworld Institute of Technology, Taiwan*

Social Intelligence plays an important role in multiple-intelligence. In E-learning designing stage, there is limited research into social intelligence evaluation in Taiwan. The goal of the present study was to adapt the Taiwan Version of the Tromsø Social Intelligence Scale (TSIS) to the digital library guide designers to evaluate social intelligence in life skill. In addition to TSIS, Computer Self-Efficiency Scale was added to do related measurement. Besides, Kepner-Tregoe Analysis (KTA) was used to collect designing scores and decide the final E-materials. Our analyses revealed good internal reliability, the correlation between TSIS and basic computer skill was high and applying KTA decided better digital library guide movies.

On-line Training for Improvement of Business Decisions
Amnon Gonen[1], Eyal Brill[2], Motti Frank[1]
[1]*Holon Institute of Technology, Israel*
[2]*Decision Makers Ltd., Israel*

Business games are usually an improved way for participants to learn in an exciting, novel and competitive way, the business world. The participants can turn business plan into real time decisions, examine their decisions and learn from their own success or failures in a competitive environment. The objective of a business game is to offer participants the opportunity to learn by doing to manage a firm and receive an immediate feedback on their decisions. In this paper we study the contribution of training to decision making by using a business game simulator. The main goal of this study is to measure contribution of business game course to a master in management program. The main results show that the business game course has a unique contribution to a management program. Its different concept from all other courses enables different learning and therefore completes the management education.

The Experience to Develop Provincial Key Undergraduate Program: Engineering Quality Led Education for Application-oriented Students
Jindong Li[1], Jixuan Feng[1], Leela Green[2]
[1]*Zhejiang Wanli University, China*
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There currently exists a sizeable gap between the qualifications of university graduates and social want. From the perspective that engineering quality constitutes a prerequisite of application-oriented graduates, the concepts of engineering quality, technique, and application-oriented requirements will be discussed in this paper, as well as the relationship between application-oriented education and engineering quality. The discussion introduces changes in educational objectives according to the present reform project in China, and puts forward the proposed methodology: that is, how to arrange classes at the forefront of engineering consciousness. A summary of the practice of developing the Provincial Key Undergraduate Program in advancing Information Management and Information Systems at Zhejiang Wanli University is presented. Our aim in the study is to apply pedagogical theory, engineering philosophy, and systems science toward the teaching and learning practices of universities.

Relevance of Technical Education For Electrical Technicians Working In Industry/Organization
Mahadev Talawar[1], Mahadevi Banad[1]
[1]*B.V.V.S. Polytechnic, India*

This era has witnessed phenomenal advancement in science and technology. A large number of science, diploma holders and technical graduates pass out from different institutions every year. At present, engineering graduates or even highly qualified engineers replace the positions of the technicians or managers/supervisors. They are unable to satisfy the demands of the industries because of insufficient practice skills, which in turn depends on the type education offered in polytechnics i.e. Today's polytechnic education is institutional based and is broadly structured to train generalist technician in a given discipline. Multidisciplinary and co-curricular activities are lacking in the curriculum of polytechnics. The role of the industry is not only limited only in production activities but also have to play the role of partnership in the system of technician education.

Build an Education Resources Allocation Planning Model of School with Integrating Information Technology
James K. C. Chen[1], Kevin C. Y. Chen[2], Sin-Yi Lin[2], Benjamin J. C. Yuan[3]
[1]*Asia University, National Chiao Tung University, Taiwan*
[2]*Asia University, Taiwan*
[3]*National Chiao Tung University, Taiwan*

The most important core competences of school education resources allocation is the teaching activities of integrating information technology into instruction. This paper explores integrating information technology into instruction how to build an education resources allocation planning model using De Novo programming for case study. We expect building an efficient planning model of integrating information technology into instruction for school education resources allocation, and using De Novo programming for achieving aspired/desired level base on education resources allocation of school. How we can be in the set budget for accomplishing the resources allocation with minimum cost. In empirical case we find if the resource limitation is loosen, and De Novo programming and resources allocation project management are implemented, the optimal resource allocation of integrating information technology into instruction will be achieved and the cost of school management can be reduced.

Study of M-learning system for Middle School
Young C. Park[1]
[1]*Baekseok University, South Korea*

Wireless-enabled laptops make it possible for students to use their time more efficiently, access databases and information from the Internet. The ubiquitous learning environment is suitable for mobile learning (m-learning). This paper discusses the characteristics and requirements of m- learning based on ubiquitous computing. And we suggest the feasible design of m-learning system and describe the case study of music education using PDA (personal digital assistant) devices for middle school in Korea.

Session	Safety, Security and Risk Management 1
Date	12/10/2008
Time	13:30 - 15:00
Room	Mercury 1
Chairs	Assed Haddad, Krzysztof Kolowrocki

Flight Risk Assessment to Airlines Using Bayesian Belief Networks and Fuzzy Comprehensive Evaluation
Songbin Ding[1], Yi Ru[1]
[1]*Civil Aviation University of China, China*

The nature of flight risk assessment has always been a problem of uncertainty. In order to quantify the risk somehow is important. Based on the previous related studies of airlines flight safety assessment a new flight risk assessment index system was built in this paper. Bayesian belief networks model with diagnostic and predictive inference was proposed to evaluate flight accident probability on the knowledge and experience of experts. Then by the use of two-grade fuzzy comprehensive evaluation with employing centralization statistical method, the accident consequence severity level could be obtained. The application through a practical example shows that the risk assessment can not only avoid the subjectivity of the experts but also deals with the uncertain information effectively. The assessment results can objectively and comprehensively exhibit the risk of flight for airlines, and the method turns out to be a feasible way to the flight risk assessment.

Radiology Staff Scheduling Under the Compressed Workweeks
Serap Ulusam Seckiner[1], M. B. Önay[1]
[1]*University of Gaziantep, Turkey*

This paper presents a computer-assisted scheduling program which produces feasible work schedules for radiology service. Implementation of such a program in system will minimize exposure to radiation and provide staff preferences while satisfying the workforce requirements of potential shifts. The developed program which produces feasible solutions in reasonable time will substantially reduce scheduling conflicts such as compulsory days off and weekend/weekday shift requirements.

Safety Plan Process for Public Sports Buildings
Toni Hyytinen[1]
[1]*Tampere University of Technology, Finland*

In Finland safety planning for public sports buildings is a challenging process because buildings are in multipurpose use and numerous organizations and personnel groups are also operating under the same roof. Local staff lacks instructions and tools to help them with safety planning. This paper presents a process model for establishing a safety plan for public sports buildings. The model was created on the basis of four case studies and constructed from experiences gained in interviews, safety planning participation and testing. The process model consisted of 11 phases and verbal instructions were created for executing each phase. The study's proposal for establishing practical safety plan procedures can also be applied to other types of public building.

An analysis of Project Risks using the Non-parametric Bootstrap Technique
Saeid Alborzi[1], A. Aminian[2], S. M. H. Mojtahedi[3], S. M. Mousavi[3]
[1]*Islamic Azad University Qazvin Branch, Iran*
[2]*Islamic Azad University Gachsaran Branch, Iran*
[3]*Islamic Azad University South Tehran Branch, Iran*

Standard statistical techniques do not always provide answers to project risks questions because often there are no parametric distributions on which significance can be estimated. Resampling methods provide a battery of tests that can be used in such circumstances. In the past few years these methods have been explored theoretically and are now employed frequently. The aim of the paper is to highlight the motivations for using a model base on bootstrap in typical project risk analysis. Bootstrap method for decreasing the standard deviation of project risks is described. We give a numerical example for better understanding.

Occupational Safety in Shared Industrial Workplaces
Juha Vasara[1]
[1]*Tampere University of Technology, Finland*

The amount of outsourcing has increased over the passing years. Employees from several employers are often working in the same workplace with diverse working methods. Companies already have good practices relating both to occupational safety of their own employees and those of their partners. This paper presents the results of interviews concerning the kind of practices industrial service providers and their customers have adopted in order to achieve a good level of occupational safety for both partners. The most important issues identified were that everyone must have a commitment to occupational safety as well as there being close co-operation between contracting parties. Occupational safety must be taken into account in every phase of the contract period, i.e., from initial negotiation of a contract to final conclusion of the contract.

Risks in Decision making - Learning from the Brent Spar Case
Mohammad Shahriari[1], Roland Örtengren[1]
[1]*Chalmers University of Technology, Sweden*

Decision making is an important element in managers' work. Despite the importance it happens that decision makers do not pay enough attention to some important factors. A decision which seems to be right might face considerable risk due to its sensitivity to other factors. One way to avoid such a situation is learning from historical cases. This paper is focused on Shell Brent Spar case and the decisions leading up to its disposal. The aim of the study is to analyse and assess interactions of different actors which are involved by means of risk assessment to identify the main influencing factors affecting the failure of the decision. The results show that different moral grounds of the actors, poor communication of Shell with the society, and being distracted by economic benefits were the most important influencing factors affecting the decision.

Session	Safety, Security and Risk Management 2
Date	12/10/2008
Time	15:30 - 17:30
Room	Mercury 1
Chairs	Mohammad Shahriari, Tao Liu

Safety of Railway Control Systems: a New Preliminary Risk Analysis Approach
Fateh Guenab[1], Jean-Louis Boulanger[1], Walter Schon[1]
[1]*Technology University of Compiegne, France*

Preliminary risk analysis (PRA) is a methodology used in critical systems safety studies. It is primarily used at the preliminary stage of the system's design so as to determine the scenarios of potential accidents, to evaluate their probabilities of occurrence (frequency) as well as the severity of the resulting consequences and to propose solutions (preventive and/or mitigative safeguards) in order to reduce the risk level in terms of severity/occurrence (to reduce the frequency of the contributors or reduce the severity of the accident). The preliminary risk analysis was largely used in several industrial fields (aeronautics, weapons systems, chemistry, railway...) in order to study the safety of the systems. From one field to another, from one expert to another, many extremely different approaches and methods are used to carry out this analysis. Moreover, the formats representing the results of the PRA are often varied as well as the terminology and the concepts related to the PRA. The main goal of this paper, completed within the framework of project ANR-PREDIT-SECUGUIDE, is to propose a PRA method and to determine standard contents of PRA to be used in the context of the railway control systems.

Health, Safety and Environmental Management Risk Evaluation Strategy: Hazard Matrix Application Case Studies
Assed Haddad[1], Cláudia Morgado[1], Daniel DeSouza[2]
[1]*Federal University of Rio de Janeiro, Brazil*
[2]*North Fluminense State University, Brazil*

This paper presents a risk evaluation and estimation methodology used for health, safety and environmental management prioritization strategies. Two case studies are presented and discussed throughout the usage of the Hazard Matrix. The Hazard Matrix is a risk management tool that promotes an organization's global evaluation in relation to health and safety at work. Workers, plant sectors and the work flow are interrelated and the exposure to hazards and environmental agents are evaluated and estimated. Analysis and discussion of the application contribute to the risk management process and determine loss prevention investments. Two cases allow an enhanced comprehension of the model. Discussion on the model adequacy and comprehensiveness of a qualitative / quantitative approach to prioritize risk management investment are also addressed.

On a Framework for Strategic and Tactical Risk Management
Chengwei Lin[1], Min Xie[1], M. Salahuddin Habibullah[2]
[1]*National University of Singapore, Singapore*
[2]*Institute of High Performance Computing, Singapore*

Strategic and Tactical Risk Management (STRM) is a risk management tool providing users with a framework to assess, monitor and manage the safety of their systems in the short and long term basis. It consists of 2 levels of analyses: the Tactical Safety Assessment (TSA) and the Strategic Safety Assessment (SSA). The tactical level analysis serves to provide a quantitative assessment of the safety of the system when a stimulus is introduced into it. The strategic level analysis helps users to improve the overall safety of the system in a long term perspective by detecting deficiencies in the safety of the system and organization. Systems can be meaningfully categorized with respect to the type of risk management needs that are pertinent to them - Understanding, Developed and Revitalize. An illustration of the application of the STRM framework will be presented on a chore of boiling water using a non-electronic kettle.

Safety Analysis of Ship Technical Systems Related to Variable Operation Conditions
Krzysztof Kolowrocki[1], Joanna Soszynska[1]
[1]*Gdynia Maritime University, Poland*

Basic safety structures of multi-state systems of components with degrading safety states related to their variable operation conditions are defined. For these systems the conditional and unconditional multistate safety functions are determined. A semi-markov process for the considered systems operation modelling is applied. Further, the paper offers an approach to the solution of a practically important problem of linking the multi-state systems safety models and the systems operation processes models. The proposed approach is applied to the preliminary evaluation of a safety function, a risk function and other safety characteristics of a ship system with varying in time its structure and safety characteristics of the subsystems it is composed.

Probabilistic Risk Assessment Framework Development for Nuclear Power Plant
Tao Liu[1], Jiejuan Tong[1], Jun Zhao[1]
[1]*Tsinghua University, China*

Advanced Nuclear Power Plant (NPP) concepts and technologies are currently under development rapidly, which make the traditional Probabilistic Risk Assessment (PRA) framework inapplicability. The objective of this paper is to illuminate this inapplicability and seek redress. The discussion begins with traditional LWR NPP's PRA framework, and then points out its cause of formation and limitations. Secondly, a new integral PRA framework is suggested based on the safety characteristics of the advanced NPP. Finally, a case study shows the structure of the renewal PRA framework.

Systems Engineering Based Model for Risk Assessment: a Case Study
Changhua Li[1], Leon Pretorius[2]
[1]*Hefei University, China*
[2]*University of Pretoria, South Africa*

Risk assessment (RA) is considered as a sub-system of risk management (RM). The socio-technical aspects of RA in a residential development (RD) are discussed within a systems engineering (SE) context. A RA model for a semi-developed project completed by a foreign developer in South Africa (SA) is discussed.

Collaboration Oriented Approach for Managing Safety and Security Risks in Organizations
Marinka Lanne[1], Janne Sarsama[1]
[1]*VTT Technical Research Centre of Finland, Finland*

Effective management of safety and security risks can help a company to avoid losses. However, organizing a risk management process can be challenging. In parallel with gathering the specific information regarding technical details from several different systems, the more wide-ranging information from organizational functions is required. In addition, risk estimating requires various knowledge and understanding concerning not only technical systems but human behavior, environmental effects and economics. It is crucial to be able to constitute an overall view of the diverse risk field in order to support decision making.
This article brings out the important role of collaboration in the risk management process. The focus is both on internal collaboration and information exchange across the boundaries. Based on the findings from two studies the framework of collaborative risk management is brought forth and practices supporting more collaborative approach for risk management are suggested.

A General Model of Ship Technical Systems Safety
Krzysztof Kolowrocki[1], Joanna Soszynska[1]
[1]*Gdynia Maritime University, Poland*

A multi-state approach to defining basic notions of the system safety analysis is proposed. A system safety function and a system risk function are defined. A basic safety structure of a multi-state series system of components with degrading safety states is defined. For this system the multi-state safety function is determined. The proposed approach is applied to the evaluation of a safety function, a risk function and other safety characteristics of a ship system composed of a number of subsystems having an essential influence on the ship safety.

Session	Reliability and Maintenance Engineering 4
Date	12/10/2008
Time	11:00 - 12:30
Room	Mercury 2
Chairs	Syed Rizwan, Mayorkinos Papaelias

Maintenance Performance Assessment (MPA) framework for Engineering Asset
Aditya Parida[1]
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Assessing Performance is a necessity for any industry today even in its simplest form. Performance assessment of maintenance process is a complex issue as it involves various inputs, outputs and stakeholders. Therefore, it is essential to consider all the relevant issues and factors for the maintenance performance assessment (MPA). The stakeholders' needs are required to be considered from different organizational hierarchical levels. In this paper, the author has tried to discuss the MPA framework from multi-criteria and hierarchical level, which is a holistic and balanced for the industrial application.

Cost Estimation for Maintenance Contracts for Complex Asset/Equipment
Anisur Rahman[1], Gopinath Chattopadhyay[2]
[1]*Griffith University, Australia*
[2]*Central Queensland University, Australia*

Maintenance contracts are becoming more and more popular to the owners of complex and critical items as maintenance through contracts reduces upfront investments in infrastructure, expertise and specialised maintenance facilities. In recent years, maintenance contracts have received significant attention due to increased profits for the service providers and reduction of risk for owners through expert services provided by the service providers. To make maintenance contracts more effective, there is a need to develop mathematical models and understand future costs that could be built into the contract price. In this paper, a conceptual model is developed for estimating cost of outsourcing maintenance of complex and critical asset/equipment taking into account both corrective and preventive maintenance as servicing strategies.

Empirical Bayes Methodology for Estimating Equipment Failure Rates with Application to Power Generation Plants
Lesley Walls[1], John Quigley[1], Kenneth Hutchison[2], Mohammad Raza[2]
[1]*University of Strathclyde, United Kingdom*
[2]*Alstom Power, Switzerland*

Many reliability databases pool event data for equipment across different plants. Pooling may occur both within and between organizations with the intention of sharing data across common items within similar operating environments to provide better estimates of reliability and availability. Frequentist estimation methods can be poor when few, or no, events occur even when equipment operate for long periods. An alternative approach based upon Empirical Bayes estimation is proposed. The new method is applied to failure data analysis in power generation plants and found to provide credible insights. A statistical comparison between the proposed and frequentist methods shows that Empirical Bayes is capable of generating more accurate estimates.

Work Force Scheduling for Mixture Policy of Preventive and Corrective Maintenance
Sakon Wongmongkolrit[1]
[1]*Kasetsart University, Thailand*

Basically, scheduling concept for mixture policy of preventive with corrective maintenance is scheduled under the least assigned workers whose have high utilization of their maintenance responsibilities. Whereas, scheduling algorithm will be exploited and applied for determining the cyclic shift work and workers scheduling in according to entirely response to the activities of preventive and corrective maintenance. Additionally, every worker will have similar of the amount day-work and day-off with the equivalency vacancies on their weekend. The thinking on the basis of probabilistic failure rate concept is the main objective of this research study, whilst the algorithm is thought on basis of mixture policy of preventive and corrective which is to be useful for all industries to do their maintenance actions.

A Combined Self-organizing Map Neural Network with Analysis Graphical Approach for Mixed-weibull Parameter Estimation
Pei-Hsi Lee[1], Chau-Chen Torng[1]
[1]*National Yunlin University of Science and Technology, Taiwan*

The mixed-weibull distribution is widely used to analyze the Burn-in time. Kececioglu had presented its parameter estimation method with application of weibull probability plot (WPP) such a graphic analysis method. However his method is not easy to estimate parameters when the data loses the failure mode information. A self-organizing map neural network (SOM) is used to cluster the classification of failure mode. We combined SOM with Kececioglu's method to estimate the parameters of mixed-weibull distribution. A simulation study is given to show the accuracy of parameter estimation of our method under small sample size.

A Novel Reliable Routing Algorithm for Network on Chips
Maryam Raiyat Aliabadi[1], Ahmad Khademzadeh[1], Mohammd Raiyat Aliabadi[2]
[1]*Iran Telecommunication Research Center, Iran*
[2]*Malek-e-Ashtar University of Technology, Iran*

As technology scales, fault tolerance is becoming a key concern in on-chip communication. In this paper we present a methodology to design fault-tolerant routing algorithms for regular direct interconnection networks. It supports fully adaptive routing, does not degrade performance in the absence of faults, and supports a reasonably large number of faults without significantly degrading performance. Consequently, this work examines fault tolerant communication algorithms for use in the NoC domain . Before two different flooding algorithms, a random walk algorithm and an Intermediate Node Algorithm have been investigated. The first three algorithms have an exceedingly high communication overhead and cause huge congestion in usual traffics. The fourth is a static fault model which focuses on the faults knowing in advance where they are located. We have developed a new dynamic algorithm based on intermediate node concept and stress value concept to overcome all of mentioned constraints.

Session	Reliability and Maintenance Engineering 5
Date	12/10/2008
Time	13:30 - 15:00
Room	Mercury 2
Chairs	Aditya Parida, Shi-Woei Lin

Spare Parts Inventory Control for the Maintenance of Productive Plants

Maurizio Bevilacqua[1], Filippo Emanuele Ciarapica[1], Giancarlo Giacchetta[1]
[1]*Università Politecnica delle Marche, Italy*

This paper analyses a set of compares different methods to effectively manage spare parts inventory, presenting a case study relating to an Italian pasta producer.
The work was divided into three phases:
- in the first phase FMECA analysis was performed in order to classify all items on the basis of their criticality.
- in the second phase ABC method was used to evaluate consumption rates of the spare parts.
- Finally different re-order point methods were compared. Three demand modelling techniques and inventory policies are evaluated using real data: 1) Normal distribution, 2) Poisson distribution and 3) Gamma distribution.
Economic Order Quantity method was used to define the purchase policy. The results showed that the normal distribution is not generally advised for modelling the demand of slow-moving items, for which a Poisson distribution is better recommended.

A B-Spline Approach to Alternating Current Field Measurement for Railroad Inspection

Mayorkinos Papaelias[1], Fausto Pedro García Márquez[2], Jesus Miguel Chacón Muñoz[2], Clive Roberts[1]
[1]*The University of Birmingham, United Kingdom*
[2]*University of Castilla-La Mancha, Spain*

Reliable detection and evaluation of surface breaking defects in rails caused by rolling contact fatigue mechanisms is of paramount importance for the rail industry. Experimental work has showed that alternating current field measurement (ACFM) techniques are suitable for the high-speed inspection of rails. This paper presents an algorithm based on B-spline estimation that analyses the shape of the ACFM signal obtained during inspection under laboratory conditions.

A Multi-Objective Optimization Approach for Defining Optimal Design Specifications Considering Performance Degradation

Sunil Bhamare[1], Om Prakash Yadav[2], Ajay Pal Singh Rathore[1]
[1]*Malaviya National Institute of Technology, India*
[2]*North Dakota State University, United States*

Many performance characteristics of a product degrade with service time, resulting into performance variation. This often costs heavily to manufacturer through repair and replacement during warranty period of a product. This paper considers the problem of time variant performance of a product and presents an approach to analyze degrading multiple responses of a product against their acceptable performance limits. The aim is to determine amount of degradation and include it to augment 'ideal' settings of design variables to ensure trouble free performance during product's intended life. The operational procedure of the proposed design technique is demonstrated using leaf spring example.

A Cure Rate Model in Reliability for Complex System

Jing Lin[1], Huiming Zhu[2]
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[2]*Hunan University, China*

This paper presents a new approach to do reliability analysis for complex system, where a certain fraction of the subsystems is defined as a "cure fraction" under the consideration that such subsystems are "longevous" compared with the entire system. Including introducing environment covariates and the joint power prior, the proposed model is developed with the Bayesian survival analysis method, and thus the problems for censored (or truncated) data in reliability tests can be resolved. In addition, a Markov chain Monte Carlo method based on Gibbs sampling is used to dynamically simulate the Markov chain of the parameters' posterior distribution. Finally, a numeric example is discussed to demonstrate the proposed model.

Structure and Dynamics of Distributed Leadership in the Perspective of Social Network Analysis

Chunhua Chen[1], Jiefang Li[1], Haibo Wang[2]
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[2]*Texas A&M International University, Armenia*

Distributed leadership (DL) is a cooperation pattern that at least two individuals act as leaders in a team. This paper goes beyond the accumulative perspective of DL. First, basing on social network theory, it analyzes the structure of leader-role distribution at team level and at individual level with the measures of density and centrality, respectively. Then, the comparison of DL and centralized leadership is delineated by the curve of density and centrality of leadership network. Finally, four phases of communication and two kinds of trust describe the dynamical development of DL, with the explanation of the character of the density curve. This paper furthers the operational concept of DL and draws a base for research on the relationship of DL and organizational performance.

On Change Point of Mean Residual Life of Parallel Systems

Yan Shen[1], Min Xie[1], Loon Ching Tang[1]
[1]*National University of Singapore, Singapore*

Mean residual life is one of the most important characteristics that can be used to measure the reliability of parallel systems. In literature, mean residual life of parallel systems has been defined in different ways. How are these mean residual life functions related to each other? To answer this question, this paper studies the mean residual life of parallel systems from the point of view of change point, at which the mean residual life function changes its trend. Different definitions of the mean residual life of parallel systems are reviewed and introduced. By comparing the change points of these mean residual life functions graphically, we find that these change points behave in a regular pattern, and all of them are related to the change point for single components in the aspect of location. These results are helpful in the determination of optimal burn-in time.

Session	Systems Modeling and Simulation 1
Date	12/10/2008
Time	15:30 - 17:30
Room	Mercury 2
Chairs	Szu Hui Ng, Jae-Yoon Jung

A Method for FE Simulation of Serrated Chip Formation during High Speed Machining Hardened Steel
Chunzheng Duan[1], Yujun Cai[2], Yuanyuan Li[1], Minjie Wang[1]
[1]*Dalian University of Technology, China*
[2]*Tianjin Key Laboratory of High Speed Cutting & Precision Machining, University of Technology and Education, China*

A finite element method involving Johnson-Cook material model and fracture criterion was used to simulate the serrated chip morphology during high speed machining AISI 4340 hardened steel in different rake angles using commercial FE software ABAQUS. The effects of rake angle and chip morphology on cutting force were discussed. The investigation indicates that the simulation results are consistent with the experiments and this FE simulation method presented can be use to predict the chip morphology and cutting force accurately during high speed machining hardened steel.

A Hybrid Simulation Model for Manufacturing Systems Using Event-State-Operation Transitions
Dongphyo Hong[1], Yoonho Seo[1]
[1]*Korea University, South Korea*

Manufacturing systems are complex and sophisticated. Modeling and simulation is effective for solving problems pertaining to these systems, such as the determination of the best configuration of a manufacturing system. Most simulation models of manufacturing systems adopt discrete-event simulation, an approach in which the continuous behavior of equipment in a spatial environment cannot be easily represented. In this paper, we present a hybrid simulation model that combine discrete-event and continuous simulation to deal with spatial and continuous state transitions. An event-state-operation transition diagram that can represent a simulation model is proposed. A simple example of manufacturing systems is modeled using the proposed approach and simulated through a transition diagram.

Development and Analysis of Fuzzy Priority Rules for Scheduling a Dynamic Job Shop Production System
Vinod V.[1], R. Sridharan[1]
[1]*National Institute of Technology Calicut, India*

This paper focuses on development and analysis of scheduling rules using fuzzy logic for scheduling a dynamic job shop. A discrete-event simulation model is developed for the purpose of experimentation. Six scheduling rules from the literature are incorporated in the simulation model. Three scheduling rules using fuzzy logic approach have been developed and analyzed. The max-min composition method is used for determining the fuzzy priorities. The fuzzy based scheduling rules perform better for mean flow time measure. One of the fuzzy based rules performs better for mean tardiness and percentage of tardy jobs.

A Hybrid GA-Simulation Approach to Improve JIT Systems
Ali Azadeh[1], Vahid Ebrahimipour[1], Parisa Bavar[1], Ehsan Shojaei[2]
[1]*University of Tehran, Iran*
[2]*Islamic Azad University Abhar Branch, Iran*

This study presents a hybrid approach involving genetic algorithms (GA) as an optimization search technique and a simulation model, representing the dynamic behavior of the system and its limitations, to improve the actual JIT manufacturing system. To achieve the objective, first, the actual system is modeled and simulated (by considering the system's limitations and its dynamic behavior). Second, the integrated simulation model is tested and validated by analysis of variance. Third, the hybrid GA-Simulation approach is used in an interactive manner to determine the optimal number of kanban cards in different stations of the actual JIT system. The presented hybrid approach is tested and applied to an auto industry production line. Furthermore, it is compared with the practical JIT through analysis of variance (ANOVA) and the results show improvements in the average daily production rate, the average resource utilization and the average cycle time but some deterioration in the average queue length and in-process inventory is inevitable.

Enhancing the Scheduling of Interventional Radiology Department Using Data Analysis and Modeling and Simulation
Balagopal Gopakumar[1], Shengyong Wang[1], Mohammad Khasawneh[1], Krishnaswami Srihari[1], Joan Hensberry[2], Davette Cummings[2]
[1]*State University of New York, Binghamton, United States*
[2]*Wilson Memorial Regional Medical Center, United States*

This paper focuses on improving the overall operations of an interventional radiology department at a community hospital in USA. In the first phase of the improvement process, significant delays, involving waiting time of patients in preparation rooms, delays in their arrival to procedure rooms, and waiting time for the radiologists, were observed. A thorough analysis of the delays led to the second improvement phase, wherein the case scheduling methodology was evaluated. Through a Design of Experiment (DOE) approach, it was determined that patient's age and the different radiologists do not have significant impacts on the procedure time. A discrete-event simulation model was then created to replicate a baseline of the current system, upon which a new scheduling model, which incorporates procedure time-blocks, was identified and evaluated. The proposed scheduling model resulted in a 16% increase in room utilization and 11% increase in daily procedure throughput, without requiring any additional resources.

A MDA Approach for Semi Automatic Grid Services Workflows Composition
Yousra BenDaly Hlaoui[1], Leila Jemni BenAyed[1]
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In this paper, we propose a Model-Driven Approach (MDA) for developing workflow applications from existing Grid services. We focus on how to model and compose workflow applications of Grid services without considering lower level description of the Grid environment. The workflows are built on an abstract level using UML activity diagram language with semantic and syntactic descriptions of services available on the Grid. Also, we define a Domain Specific Language using the extension of the UML activity diagram notation. This extension deals with additional information allowing an automatic composition of workflows and containing appropriate data to describe a Grid service. These data are useful for the execution of the resulting.

Re-Engineering Fiber Optic Production Process by Simulation, Design for Assembly Line
Wichai Chattinnawat[1]
[1]*Chiang Mai University, Thailand*

This research aim to re-engineer the process in order to improve both productivity and quality of LC Duplex connector optical fiber production line. This re-engineering process research for fiber optic production process had adopted line balancing, design of assembly line and cellular manufacturing to improve the productivity and quality of the process. Simulation has been used as a mechanism for finding solutions of improvement. The design for assembly line adopt the optimization algorithm of minimizing the maximum between the operation times of each cells and its average. The results showed that the productivity was increased, line balancing efficiency was dramatically improved, and work in-process was reduced as well as the improvement in quality.

Grazing-Sliding Bifurcation Induced by Dry-Friction in a Braking System
Fenghong Yang[1], Hongzhi Tong[2], Yun Tang[3]
[1]*Central University of Finance and Economics, China*
[2]*University of International Business and Economics, China*
[3]*Tsinghua University, China*

We investigate numerically the nonsmooth bifurcation induced by dry-friction for a braking system and find that there exists grazing-sliding bifurcation with multi-sliding part which can lead to chaos suddenly.

Session	E-Business and E-Commerce 1
Date	12/10/2008
Time	11:00 - 12:30
Room	Mercury 3
Chairs	Jae-Yoon Jung, Chui Young Yoon

The Use of E-SQ to Establish the Internet Bank Service Quality Table

Yu-Lung Wu[1], Michael C.S Chang[1], Pei-Chi Yang[1], Ying-Jun Chen[1]
[1]*I-Shou University, Taiwan*

In order to assist Internet bank to be able to reach the enterprise's goal, which is satisfying the customer's demand and this goal is different from the PZB service quality model; thus, this study uses ZPM E-Service Quality Model as the foundation to assess websites. The study object would be the companies that provide Internet bank services at present. Then, the factors that influence customers' quality satisfaction towards services would be generalized, and the questionnaire survey would be carried out the users, administrators, and employees of Internet bank. A service quality table that assesses Internet bank would be established through the evidence-based study result, it also verifies that information gap, design gap and fulfillment gap are significant. The result also finds out eight dimensions, including "efficiency", "reliability", "privacy", "compensation", "responsiveness", "contact", "sense of beauty" and "individualization", are the key factors that influence the service quality of Internet bank.

Success Factors of E-Learning System Based on Students' Perspectives

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As a result of Information Technology continuously growing, educators and training developers need not only rethink their approach to teaching and training but also decides how technology can support it. One issue for them is E-learning, also known as distance learning, online learning, web-based learning and so on. However, much of it is quantity research or system implementation. Educators make efforts to discover proper teaching, learning and assessment strategies for their students and MIS researchers are devoted to provide or develop a suitable learning environment for students. But these researchers lack further discussion on both Educational Psychology and technologies. Therefore, the objectives of this paper try to explore student concerns when using e-learning system from an IQA approach with a qualitative research method. The result showed that Instructional Content Planning and Learning Process Support were Primary Drivers while Learning Interaction was a Primary Outcome. Instructional Resource Arrangement and System Function were Secondary Drivers while On-line Testing and Feedback were Secondary Outcomes.

An Explore Study of Non-Using Online-Auction People

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In recent years, online auction marketplaces growing rapidly. There are 2,565 auction websites on Online-auction List reports. According to MIC report, about half of the internet users who still have no online-auction experience. Why they don't use online-auction yet? What can affect them to on-line auction? If we can make Internet users to use e-auction, then the online-auction market share will increase. In this study, we use Interactive Qualitative Analysis approach (IQA) to draw non-using experienced people's mindmap for online-auction. To understand why they still not use e-auction yet and try to find out how to make them become e-auction users. The implications of these findings are discussed and managerial guidelines presented.

Interactive 3D Visualization of Customized Products with Behaviors

Tien-lung Sun[1]
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VR-based interactive 3D visualization help customers better understand the product design features. Due to the many possible ways to configure a customized product, the VR model of a customized product can not be pre-defined. It has to be dynamically generated during customization. Previous researches on VR-based visualization of customized products only consider geometry and appearance; the behavior is seldom considered. This paper proposes an approach to dynamically generate behavior-included VR models for customized products. First the customization strategy and the behavior programming strategy are discussed. Then a variant approach for dynamic generation of behavior-included VR model is described. Finally, the process to construct the VR model template and to dynamically modify the template during run-time simulation is described.

Design of the Collaborative Commerce System Model: an Application Issue in Theme Park of China

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With quickly development under Internet promotion, e-commerce is changing traditional business model increasingly. E-commerce in tourism industry just start in China and more used in hotel and travel agency, and few e-commerce model can be seen in tourism destinations and theme parks. But now theme park are fast developing in China and need to build up a collaborative commerce platform to improve the cooperation relationship with their brother enterprise and business partner. With the aid of autonomy, easy adaptation, flexible and dynamic characteristic of Agent technology, the authors puts forward a collaborative commerce model base on Multi-Agent System (MAS) technology. It can be used to describe the interaction relationship with partners and can run on the cooperation among the different MAS layers. Many useful functions, including automated learning, data analysis and mining, best solution selection etc, can be realized in this unified collaborative commerce system.

Monitoring Usage Behavior in Subscription-based Services Using Control Charts for Multivariate Attribute Characteristics

Yaser Samimi[1], Abdollah Aghaie[1]
[1]*K. N. Toosi University of Technology, Iran*

Industries such as telecommunication, cellular phone services or online content providers supply varieties of services to their customers for a specific subscription fee for a given duration of time. Controlling churn rate is an intricate operation for such industries because of the multiplicity of customers, diversity of services and various usage patterns. It may be recorded, in its simplest form, for each customer whether she/he uses different types of services during each data gathering period. Hence, usage behavior of an individual customer could be represented by a binary vector, which may be modeled statistically as a multivariate discrete distribution. This paper presents how to employ control charts for multivariate attribute characteristics to monitor systematically the mean of the customers' usage pattern along the time. It is shown that applying the appropriate method allows the firm to detect quickly significant changes in usage behavior and so prevent from customer churn by remedial marketing policies.

Session	E-Business and E-Commerce 2
Date	12/10/2008
Time	13:30 - 15:00
Room	Mercury 3
Chairs	Tien-Lung Sun, Raj Siriram

A Web Services Based Framework for RFID Bike Rental Business Solutions
Kuo-shien Huang[1], Shun-ming Tang[1]
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Radio Frequency Identification (RFID) is a technology to facilitate a ubiquitous environment. For a ubiquitous environment, it is necessary to model an RFID information framework based on a network. A web service is a Service Oriented Architecture (SOA) that can achieve this purpose. Using internet web services enterprises will exchange information quickly and easily. And an enterprise could maintain strategic alliances with different classes of businesses. Creating an information system and a platform is easy, but it is difficult to deploy when using RFID. RFID has both advantages and disadvantages. So to avoid problems, establishing a strong business process is important before system development. This paper is a practical case study that uses an RFID in a bike rental business, and addresses a method to realize.

A New Collaborative Filtering Approach Utilizing Item's Popularity
Weiwei Xia[1], Liang He[1], Lei Ren[1], Meihua Chen[1], Junzhong Gu[1]
[1]*East China Normal University, China*

Collaborative filtering (CF) is one of the most successful technologies in recommender systems, and widely used in many personalized recommender areas, such as e-commerce, digital library and so on. However, most collaborative filtering algorithms suffer from data sparsity which leads to inaccuracy of recommendation. In this paper, we focus on nearest-neighbor CF algorithms and propose a new collaborative filtering approach. First, we suggest a new missing data making up strategy before user's similarity computation, which smoothes the sparsity problem. Meanwhile, the notion of item's popularity weight is defined and introduced into the computation. After then, when facing with new users, we also find a kind way to alleviate the difficulty in recommendation. The experimental results show our proposed approach outperforms the other existing collaborative filtering algorithms. It can efficiently smooth the inaccuracy caused by ratings sparsity, and can work well in generating recommendation for new users.

Analysis on the Quantity Effect of Electronic Secondary Market on the Perishable Goods Supply Chain
Chu Shan[1], Yaobin Lu[1]
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The advance of business-to-business commerce has result in the establishment of many types of electronic marketplace. This paper focuses on a market exchange as the "secondary market" for the perishable goods—that is, for the resellers to disposal and acquisition of excess perishable goods inventory. Follow the method of Lee and Whang(2002) and Yan(2005), we investigate the quantity effect of the electronic secondary market on the perishable goods supply chain, which dictates the influence on the sizes of the retailers' initial orders at the beginning of selling season . And we also find that the existence of secondary markets will expand the impact of the overestimate of the mean demand with given condition.

Electronic Procurement Systems: an Integrative Model to Explain Procurement Performance
Antonio Aguiar[1], Keshavamurthy Ramamurthy[1], Antonio Reis[2]
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Although Electronic Procurement Systems (EPS) may foster superior company-level performance, their complexity and an accompanying need for commitment of a substantive amount of firm's resources necessitate great care in their development and in the implementation process. Indeed, poorly managed implementation process could result in underachievement of the expected benefits. Our study focuses on fostering an effective EPS implementation processes through a better understanding of the factors that influence implementation success. Based on an extensive review of the extant literature and considering the specific attributes of EPS we develop and propose an integrative model to explain Procurement Performance. We posit that EPS Implementation Success is determined by the EPS Project Management process, the firm's Absorptive Capacity, and its IT Competence. We further posit that Systems Integration between the focal firm and its main suppliers moderates the relationship between EPS Implementation Success and the Procurement Performance achieved by the firm.

Applying Coloured Activity Net to Model Interorganizational Workflow
Hong Feng Lai[1], S. G. Chen[2], W.-H. Jeng[3]
[1]*National United University, Taiwan*
[2]*Tungnan University, Taiwan*
[3]*Minghsin University of Science and Technology, Taiwan*

With the growing complexity of transactions in internet-based environment, it is crucial for managing process interaction between agents. Work item allocation in workflow management may involve the coordination and distribution of activities among diverse organizations. To aid the allocation process is still of great interest to the designers of interorganizational workflow. This paper proposed a method coloured activity net (CAN) which integrates the process, case, and resource viewpoints based on coloured Petri net and agent-based concepts. First, we introduce a workflow specification module to express the message transferring, state changing, process execution, and resource sharing. We then apply the CAN to model an interorganizational workflow that involves message transferring forward and backward between partners. After being validated by simulation of the CPN Tools, the soundness of CAN model can be verified by state space analysis under the support of CPN Tools, e.g. the reachability graph, liveness property, home marking, dead marking, and fairness property. The results demonstrate that the CAN is feasible to model interorganizational workflow.

Service Integration Toward Ubiquitous Business Process Management
Jae-Yoon Jung[1], Jaehyun Kong[2], Jinwoo Park[2]
[1]*Kyung Hee University, South Korea*
[2]*Seoul National University, South Korea*

Ubiquitous enterprise environments are getting more and more complicated since pipelined operational systems have been interconnected according to the temporary necessities. Service-oriented architecture based on web services technology provides a promising platform where the enterprises are allowed to coordinate seamlessly e-Services on the heterogeneous information systems. Nevertheless, the architecture remains some weak points in adopting it to ubiquitous enterprise environments. In this paper, a methodology of business process management for ubiquitous enterprises is introduced by use of event-driven services technology and active rule processing. We also illustrate the proposed architecture with a case scenario of an international post-sales service company of electronic products.

Session	Information Processing and Engineering
Date	12/10/2008
Time	15:30 - 17:30
Room	Mercury 3
Chairs	Yisong(Lydia) Zheng, Michel Aldanondo

Business Application Integration in the Demand-driven Environment - a Case Study
JrJung Lyu[1], Ping-Shun Chen[2]
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[2]*Chung Yuan Christian University, Taiwan*

Production planning and controls usually involve numerous business application systems, including manufacturing execution systems (MES), enterprise resource planning (ERP), advanced planning and scheduling (APS) and other information systems. Implementing each of these systems is a complex, costly and time-consuming project. Moreover, due to the fierce competition in the global market, mass customization has become the mainstream in the demand-driven environment which increases the difficulties in the integration of heterogeneous information systems. This research adopts a case study approach to examine the business application integration processes in the demand-driven environment and to identify potential solution in the project. Specifically, this study proposes a reference framework of integrated application systems for production planning and shop-floor control, and discusses several implications of such large-project implementation.

Data Mining for Managing Stock Keeping Units
Shieu-Hong Lin[1]
[1]*Biola University, United States*

Stock keeping units (SKUs) are compact identifiers representing billable products in the inventory for sale. Merchants often assign SKUs by transforming the text descriptions of the products following various implicit SKU encoding schemes. In the transformation process, the text description of a product is divided into character blocks, some blocks are skipped, and the remaining are abbreviated and aligned into the SKU in a new order. In this paper, we describe an instance-based data mining approach for automatically (i) extracting likely underlying SKU encoding schemes as explicit formal encoding and alignment patterns, (ii) inferring a list of likely SKUs given the text description of a new product, and (iii) inferring a list of likely text descriptions given the SKU of a product with missing text description. We have built a prototype system for testing on real-world datasets, and the empirical results confirm the effectiveness of the approach.

Research Into The Driver's Route Choice Under Existing Real-Time Traffic Information
Yisong(Lydia) Zheng[1], Qian Wang[1], Ling Wang[2], Mo Kuang[3]
[1]*Nankai University, China*
[2]*China University of Political Science and Law, China*
[3]*Southwest Jiaotong University, China*

The research of driver's route choice behavior helps to increase utility of existed route network (especially city traffic network), and improve traffic conditions. From the point of macroscopic view, through discussing the time evolution pattern of driver's route choice behavior with the influence of dynamic traffic information upon the pattern, it is proved that the behavior of route choice is uncertain. So in designing traffic guiding system or traffic information system, the influence of disturbing factor should be taken into consideration to guarantee a balanced dynamic traffic distribution of the system.

One-Against-One Fuzzy Support Vector Machine Text Categorization Classifier
Huei-Min Chiang[1], Tai-Yue Wang[2]
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[2]*National Cheng Kung University, Taiwan*

The growth of the internet information delivery has made automatic text categorization essential. This investigation explores the challenges of multi-class text categorization using one-against-one fuzzy support vector machine with Reuter's news as the example data. The performances of four different membership functions on one-against-one fuzzy support vector machine are measured using the macro-average performance indices. Analytical results indicate that the proposed method achieves a comparable or better performance than the one-against-one support vector machine.

Integration of RFID with Mobile Commerce for Consumer Marketing
Carman Ka Man Lee[1], Stephen X.J. Chen[1], C.A. Mitrea[1]
[1]*Nanyang Technological University, Singapore*

Mobile Commerce (M-Commerce) and Radio Frequency Identification (RFID) are two major industries which everyone recognizes their contribution at the overall world economy. In order to have an integrated information system, the purpose of this paper is to integrate RFID technology with M-Commerce so as to promote products and unique cross-selling to consumers, which can transform a traditional retail industry to be more effective in coping with market changes. A RFID prototype system with mobile capabilities is being designed in an integration framework and a virtual retail store is being developed to demonstrate and enhances the feasibility of this convergence. The proposed prototype is analyzed at all three functional levels: Device, Application and Process. The significance of the paper is to provide a novel approach by incorporate RFID and data mining technologies in M-Commerce for consumer marketing.

Component Based Design Data Version Management and Visualization in IMS-DATE
Dongliang Cui[1], Guoqi Feng[1]
[1]*Northeastern University, China*

Complex product development is an interdisciplinary cooperative process with the characteristics of enormous quantity of engineering data, process uncertainty, frequent engineering changes and disturbances. Version management is a key part of engineering data management for conserving the consistency of design data and tracking engineering change orders. Therefore comprehensive mechanism is required to handle large mount of intermediate results in complex product design processes in order to achieve efficient information and knowledge management. A component based version management model across different design projects is designed, which implements efficient design processes and project data management in an integrated management system for aerodynamic design of aero turbine engine (IMS-DATE). Key version control technologies of version merge and visualization are also discussed. The new version model and related version control technologies proposed in this paper can well satisfy the requirements of complex engineering design projects and enhance design efficiency consequently.

A Closed-loop Engineering Approach for Modular Design Based on Collaboration And Optimization
Yanqiu Xiao[1], Qing Xue[1], Aimin Wang[1], Houfang Sun[1], Guoxin Wang[1]
[1]*Beijing Institute of Technology, China*

A closed-loop modular design approach based on collaboration and optimization is presented. Aimed at improving the efficiency of specific design and the evolution of family structure, the framework of process and techniques is rebuilt, and two important links and their techniques are researched, including collaborating among modules and optimizing of modular scheme. To apply specification of product family and realize collaboration among modules in synthesizing phase, a multi-view correlated model is used to express modular family, and an integrated model is given to combine it with the counterpart process model. Besides, collaborative model and its strategies are built up. To resolve conflicts and optimize family structure, an intelligent model is constructed with resolution mechanism. Finally, a prototype system of software was developed and applied in design of diesel engine, which proved the effectiveness of this approach to support collaborative modular design and scheme's optimization iteratively.

Session	Poster Session 2
Date	12/10/2008
Time	10:30 - 11:00, 15:00 - 15:30
Room	Venus 1

Modeling a Combination of Projects Selection System- Using the Mahalanobis Taguchi System

Ching-Lien Huang[1], Chang-Lin Yang[2], Tsung-Shin Hsu[3], Chih-Ming Liu[4]
[1]*Lunghwa University of Science and Technology, Tsing Hua University, Taiwan*
[2]*Fu Jen Catholic University, Taiwan*
[3]*National Taiwan University of Science and Technology, Taiwan*
[4]*Tsing Hua University, Taiwan*

A combination of projects selection decision (PCSD) shows the main strategy of a company. Simultaneity, the utility of project selection decision is assessed how individual project parameter dimensions are selected and to identify the combination of projects architecture dimensions that are critical for a project combine selection strategy system (PCSS). Conventional researches in project selection decision system, which are focus on computing the present parameters not on searching for a suitable pattern. These studies attempt to generate the optimal selection rule. Nevertheless, studies which show in combination of projects selection decision (CPSD) are scarce. From literatures finding that the Mahalanobis-Taguchi System (MTS) algorithm is successful and effective for data-mining pattern recognition. Therefore, this work presents the MTS algorithm, which offers to the new application on combination of projects selections.

Optimization of Feature Weights and Number of Neighbors for Analogy Based Cost Estimation in Software Project Management

Yanfu Li[1], M. Xie[1], T. N. Goh[1]
[1]*National University of Singapore, Singapore*

Software cost estimation affects most activities of software project development. In past decades, many methods have been proposed for cost estimation. Analogy Based cost Estimation (ABE) is among the most popular techniques due to its conceptual simplicity and empirical competitiveness. In order to improve ABE model, many previous studies have focused on optimizing the feature weights in its similarity function. However, the K number of nearest neighbors is also an essential parameter of ABE. Nevertheless, few studies attempt to optimize K and most of them are based on the trial-error scheme. In this study, we propose the Genetic Algorithm to simultaneously optimize K and the feature weights for ABE (OKFWSABE). The proposed OKFWABE method is validated on three real-world software engineering datasets. The results show that our method could significantly improve the prediction accuracy of ABE and has the potential to become an effective method for software cost estimation.

Business Engineering with Scenario Technique

Volker Grienitz[1], Volker Blume[1]
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Companies often find themselves confronted with complexity of increased pressure to ensure their competitive market position. Business engineering should base on the anticipation of weak future signals. The paper describes one approach to this issue – Scenario Technique. Scenario Technique is a special method to catch future business opportunities and risks and allows to involve workshop members, experts and in particular customers. This paper explains two approaches – Scenario Workshops and Scenario Projects - as ways of applying Scenario Technique. The differentiation ensures that the right effort is done to answer the right questions. Both processes Scenario Workshop and Scenario Project are illustrated by an example.

Six Sigma - An Innovative Approach For Waste Reduction: A Case Study Of An Indian SME

Sunil Deshmukh[1], Ramesh Lakhe[2]
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This paper presents a case study aimed at reducing waste at an SME engaged in manufacturing of corrugated boxes. The Define, Measure, Analyze, Improve, Control strategy of Six Sigma methodology was followed to identify, probable causes for wastages. After studying the system, and implementation of six sigma tools, an overall 22.7% waste reduction was achieved. Individually, out of a total seven processes, 5 showed waste reduction in excess of 40%. This reduction was statistically significant at $P<0.05$. The study confirmed successful implementation of six sigma to minimize waste generation and in terms saving in manufacturing costs or increasing the bottom line.

Effects of Heterogeneous Variance on Xbar Chart

Wichai Chattinnawat[1]
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This research investigated the performance of the chart when the heterogeneous variation occurs. Machines are regarded as another source of variations with an assumption that the expectation of the quality characteristics produced by each machine is normally distributed. This study report the derivations of the computation of an effect of false alarm, and/or in different way the computation of an efficiency of Xbar chart in detecting change of process, due to heterogeneous variation. This research study was divided into two cases. If the extra variation is not accounted for during control chart, only part of within variation is used, the misplace control limits will be narrower since the variation are under-estimated leading to significant false alarm rate. When the extra variation is accounted for, the methodology to determine the control chart is provided. The result shows that the probability of detection and ARLs of the chart has increasing power of detection regardless of the sample size as the extra variation gets larger.

An Empirical Study on Total Quality Management in Maintenance and Repair Workshops in India

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The paper presents the survey result and analysis of TQM practices being followed by maintenance and repair workshops which are raised to provide intimate maintenance and repair support for wide variety of highly complex and sophisticated equipment in the diverse terrain and weather conditions in India. From an extensive review of total quality management literature, the external and internal environment affecting organization's quality performance the ten primary elements of TQM are identified. Thus the survey focused on nine critical factors (Organisational commitment, Human resource management, Quality policy , Role of quality department, Quality Information system, Operating procedures, Technology utilization, Supplier focus, service design, and training) with 92 items comprehensive instrument for explaining and predicting quality management practices. This paper reveals that Indian repair workshops are gearing up to respond fast to the growing awareness of the equipment users of high quality. It is accepted that implementation of TQM philosophy is a must for its survival and growth.

Propagation and Control of Quality in the Extended Manufacturing Supply Chain: Theoretical Models, Methodologies and Implementation Perspectives

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[2]*Brunel University, United Kingdom*
[3]*National Physical Laboratory, United Kingdom*

Statistical quality and process control are integral to the production process, ensuring continuous, in-control operations and enquiring into the micro processes, structures and dimensions that determine conformance. Quality management systems (QMS) and inspection plans tend to be confined to the firm and do not account for external processes. In recent years a shift toward supply chain (SC) dominated thought has pervaded many areas of manu-facturing well beyond the traditional purchasing and logistics functions. This shift in focus opens interesting avenues for investigation in the domain of quality control, particularly with regard to design of quality measurement systems that integrate across the distributed production network. The present paper asks how quality propagates through the SC and proposes a model for the design of a distributed QMS that facilitates traceability, optimisation and quality assurance. We discuss how design parameters and cross boundary integration affect process output and other per-formance measures, and the use of uncertainty in strategy building.

Study on Testing Strategies for Standby Systems
Min Wang[1], Mingchih Chen[1]
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Surveillance test schedule has been studies to increase standby system unavailability and keep plant safety. In earlier research, testing strategies, such as simultaneous or uniformly staggered testing, have been applied for simpler standby systems and the optimal test interval can then be obtained. For more complex systems, the best testing schedules were obtained by comparing the performance of pre-specified testing policies by using computer software or simulation. In this study, we provide some suggestions for building up testing strategies for complex systems to maximize system availability.

Dynamic Process of Information Distribution in Metro Emergency Management Network
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Metro emergency management (MEM) is a kind of systemic and complex work and it needs synergic supports from all kinds of organizations, the links between which are the distribution of information. In this paper, the dynamic process of information distribution in MEM network was analyzed by using the theory of social network. The differential model of information distribution was put forward and the parameters related to the efficiency of distribution were presented and analyzed with numerical simulation. The research results indicated that the dynamic process of information distribution in the network is of great importance for the emergency management.

Simulation-based FDP & FCP Analysis with Queueing Models
Qingpei Hu[1], Rui Peng[2], Szu Hui Ng[2], Huaiqing Wang[1]
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Continuous efforts have been devoted to software reliability modeling evolution over the past decades in order to adapt to the practical complex software testing environments. Many models have been proposed to describe the software fault related process. These software reliability growth models (SRGMs) have evolved from describing one fault detection process (FDP) into incorporating fault correction process (FCP) as well, in order to provide higher accuracy with more information. To provide mathematical tractability, models need to have closed form, with restrictive assumptions in a narrow sense. This in turn confines their capability for general applications. Alternatively, in this paper a general simulation based queueing modeling framework is proposed to describe FDP and FCP, with resource factors from practical software testing incorporated. Good simulation performance is observed with a numerical example. Furthermore, release time and debugger staffing issues are investigated with a revised cost model. The analysis is conducted through a simulation optimization approach.

Adoption of Iris-Based Authentication
Shahriar Mohammadi[1], Arman Kaldi[1]
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Even though iris-based systems have proven to be very promising in a world where security is crucial, surprisingly enough, this means of authentication has not been given a very warm welcome from the users. In order to appropriately confront this issue, critical success factors of the deployment of networked-based systems for iris authentication - namely technical, human, and implementation aspects, as well as necessary policies and standards - need to be carefully considered. One of the major success factors is the adoption issue concerning this relatively new technology. The decision to adopt iris-based authentication is influenced by many factors, including user characteristics, social factors, and technology characteristics. Addressing these key factors is extremely valuable for the successful implementation of iris-based technology.

The Research of Noise Induced Tympanic Membrane Perforation in Cotton Textile Industry
Shiqiang Wang[1], Ruixiang Song[1], Kun Yao[1], Yu Wang[1]
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Objective: To explore the influence of industrial noise to workers' tympanic membrane. Methods： The collected data are divided into different groups in accordance with the purpose of the analysis, and then find out the difference by contrast with different groups. Results： The incident rate of hearing loss is 10.91% and the incident rate of tympanic membrane is 0.53%, and the incident rate of male and female tympanic membrane perforation is 0.32% and 0.21% respectively. Conclusion： High-intensity industrial noise can chronically perforate workers' tympanic membrane.

Multi-Hierarchy and Fine-Grained Task-role-based Access Control in Collaborative Environments
Junqing Li[1], Xinyou Li[2], Shengxian Xie[1], Chen Chen[2], Guangliang Liu[1], Yuxia Pan[1]
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[2]*Information Security Research and Services Center, China*

This paper presents a novel multi-hierarchy and task-role based access control model named H-TRBAC. In the model, we create two multi-hierarchical sets, i.e., a role set and a task set. In the task hierarchy, a task may have some partial ordering relationships with other tasks. A task can not be scheduled until its entire ancestors are completed. It is the task's duty to select necessary roles and permissions and assign a proper permission to a suitable role. The assignment process will be done only when the task is run, and permissions will be revoked just after the task turns to other states. At last, we give all the necessary operational functions to describe the structure of H-TRBAC, and detailed comparisons among our model and others are also given.

Research of Evaluating Credit-Risk in Power Enterprise Based on SVM and VIKOR Method
Yuansheng Huang[1], Ying Yan[1]
[1]*North China Electric Power University, China*

Some clients are in arrears with a great amount of electricity charges in operation of power system, which has seriously hindered the healthy development of Electric Industry. Evaluation of clients' credit is an important problem of management in Power Supply Enterprises.

Considering the training time and the accuracy, a new algorithm based on Support Vector Machine (SVM) and VIKOR method is adopted to solve this problem. Support Vector Machine (SVM) was proposed to solve the small sample learning problem. VIKOR method was developed to solve decision problems with conflicting and with different units criteria.

Finally, an application example has been given to test the feasibility and effectiveness of the proposed method.

The Empirical Impact Analysis of Technical Barrier of Trade (TBT) to China's Vegetable Export to Japan
Shuang Li[1], Xiangyu Guo[1], Wei Qian[1]
[1]*Northeast Agricultural University, China*

Vegetable is an important agricultural export product of China. Japan is the one of main export countries of Chinese vegetable trade Over the past few years, the Technical Barrier Trade becomes the main reason to prevent our agricultural products from the exports to Japan. The paper employs the gravity model to do an empirical analysis using the data of Japan and Chinese from 2003 to 2006, then applies to Chinese vegetable exports trade and puts forward some policy suggestions. The domestic manufactures need to raise product quality as much as possible, and the government also needs to work out quality standard beneficial to protecting consumer actively. The higher the standard of China, the closer the Chinese standard with import countries, the more can China promote export.

The Market Entry/Exit Model on the Free Internet Service Firm
Tyrone T. Lin[1], Hai-Ling Kang[1]
[1]*National Dong Hwa University, Taiwan*

This study utilizes the real options approach to construct the investing (disinvesting) decision model on free internet service. Two firm values of the internet service industry include the cash flows from the usage of free software and the potential value of entering (exiting from) the market so as to evaluate the firm value.

Business Transformation of SMEs from "Product Supplier" to "Value Provider" Supported by an Extended Product Business Model
Kim Jansson[1], J. Hemilä[1]
[1]*Technical Research Centre of Finland, Finland*

The transition from "product supplier" to "value provider" can be seen as the most relevant challenge for industrial enterprises. New integrated product and service approaches are needed to enable this paradigm shift. The extended product represents an integrated approach for tangible products and intangible product assets. The paper presents a structure and an abstract conceptual model that represents the business and money-earning logic of a company based on the extended products paradigm. The intention of this paper is to encourage adoption of the extended product model and to motivate the transition process from product supplier to value creation provider within traditional manufacturing SMEs. An extended product model and module is introduced. Using a well-known business model the paper proposes the extended product business model ontology as a vehicle for SMEs to create viable business from service offerings.

Comparison and Modification of Customer Satisfaction Indexes
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Customer satisfaction can present customer demand orientations and serve as an indicator of competitive advantage. However, it has been discovered that there are a total of eight satisfaction indexes available. Although each of them is valuable for application, decision-makers are still unable to select an appropriate index to improve specific quality attributes of certain products. Therefore, this study aims to develop a modification index to rectify the meaning of satisfaction measurement and enhance accuracy. The results show that the improvement priorities derived with the proposed index can not only satisfy various theories proposed by previous researchers but also present better reliability compared with the eight extant indexes. In practical applications, the proposed decision diagram can demonstrate the improvement priority of each item and also assist decision-makers in the choice of improvement directions. Overall, compared with the extant eight indexes, the proposed new index has a higher application value.

Mapping TQM-Innovation Relationship on Learning Organization: A Strategic Management Perspective
Wen-Jung Chang[1], Shu-Hsien Liao[1], Christina Tay[2], Chi-Chuan Wu[1]
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[2]*National Chengchi University, Taiwan*

It is true that the only constant thing in life is continuously changing. Managing change is high priority for continuing education institutes (CEIs), one of knowledge intensive industry (KII) in Taiwan, coping simultaneously with diversified market needs and limited resources. In today's business environment, 'quality' and 'innovation' are regarded as key resource of competitiveness. However, past researches related to TQM-innovation relationship largely focused on the manufacturing and the services. Besides, they have oversimplified the contextual effects that might bring biased conclusions. In a word, there probably exists a missing linkage somewhere in the so-called 'environment-strategy-performance' (ESP) chain. Therefore, this study proposes a strategic model named 'ESCAPE' by modifying the original ESP model to explore the potential gap within the context. After examining the ESCAPE model, this study argues that a learning organization will be the best solution for KII to bridge the gap.

Research on Supply Chain Cost Reduction Based on Process and Time Analysis
Taoyong Su[1], Xinghui Lei[1]
[1]*Tongji University, China*

With increasingly intense competition many companies have extended the scope of their cost management activities across organizational boundaries. Supply chain cost reduction becomes a new source of achieving competitive advantage. Although interests in reducing supply chain cost are growing, few researches have been directed towards a systematic development of supply chain cost reduction. To reduce supply chain cost, firstly the structure of which should be seen clearly. This study analyzes the supply chain processes and supply chain time, identifies the components of supply chain cost and how these costs occur and be influenced. Based on the analysis and integrating previous research findings, this paper presents a theoretical model, which provides the foundation and specific techniques for cost reduction in supply chain.

Optimal Outbound Dispatching Policy with Pricing
Ki-sung Hong[1], Chulung Lee[1]
[1]*Korea University, South Korea*

Under a VMI(Vendor Managed Inventory) system, the vendor holds a certain level of control over not only inbound replenishment decisions on stocking but also outbound re-supply decisions. Hence, vendor faces a better opportunity to synchronize the inventory and transportation decision. While shipment consolidation can reduce the transportation cost, however, delivery time to the customer may increase. Thus, inventory and transportation decision must be coordinated considering both customer service requirement and transportation cost. In this study, we have developed an optimal outbound dispatch policy to maximize profits under a quantity based dispatching policy. A mathematical model is developed and an efficient algorithm is provided to obtain the optimal parameters for the proposed policy.

A Multi-Objective Reverse Logistics Network for Product Returns
Chien-Chung Lo[1], Hsin Min Chen[1], Haw-Lieng Huang[1]
[1]*National United University, Taiwan*

Product return network design usually may involve multi-objective decision making, for example total reverse logistics costs, loads balance for product return operations on product collection points and the convenience of customers who return products, etc. In this study, a fuzzy multi-objective reverse logistics network for product returns is developed. The goal of the proposed model is to determine the optimal number and location of initial collection points for returned products and the location/allocation of centralized return centers. We employ a weighted max-min approach for fuzzy goal programming to formulate the multi-objective product return system. A soft computing, differential evolution (DE) is proposed to solve the problem. We show that the solution derived from the fuzzy method satisfies the decision maker's desirable achievement level of the objectives. A case example is presented to illustrate the model implementation.

Study on the Collaborative Production Systematic Platform for Chinese Automobile Manufacturing Supply-demand Network
Zhaofang Mao[1], Ershi Qi[2], Xiaomei Li[1], Fu Jia[3]
[1]*Tianjin University Science Park, Tianjin University, China*
[2]*Tianjin University, China*
[3]*Cranfield University, United Kingdom*

Nowadays, more and more Chinese automobile enterprises realized that to be the winner of the marketing competition, all member enterprises should cooperate to pursue the maximum integral profit to realize the long-term sustained development of their SDN (Supply-demand Network), instead of seeking their own maximum profits. Manufacturing process, which is related to the whole product lifecycle from product design, production arrangement, order confirmation, production plan work out and optimization, production dispatch, manufacturing implement to automobile product delivery to their customers, even including the product guarantee period, is the most important and complex part of the whole automobile SDN. On the basis of systematic

investigation of several automobile manufacturing enterprises, this paper builds up an systematical frame composed of such functional modules as technology planning, flexible production plan, manufacturing implement and optimization, production dispatch and process control, which provide the platform to realize the "flexibility" allocation on coordinated manufacturing system.

System Modeling and Simulation of Order Processing Based on Extend Technique

Yeqing Jia[1], Xiaoxiao Jia[2]
[1]*Southeast University, China*
[2]*University of Arkansas, United States*

As a crucial and critical aspect of the third parties operation, order processing determinates the performance of the service. This situation sheds a light to the importance of order processing. After analyzing the processing flow, this paper proffer a discrete system model and imitate this model via deploying Extend simulation software, on the basis of which several defined approaches are figured out. By the same token, compare the baseline case with polished programs to incarnate the advantages of the later ones.

Profit-sharing Mechanisms for the Production-Distribution Alliance

Hsin Min Chen[1], Haw-Lieng Huang[1], Chien-Chung Lo[1]
[1]*National United University, Taiwan*

Profit-sharing is one of the most important coordinating mechanisms for successful operating a production-distribution alliance. This paper provides the alliance with single producer and multi-distributor two profit-sharing mechanisms: (1) profit-sharing based upon operating costs and (2) profit-sharing based upon average efficiency by data envelopment analysis (DEA). Operating costs for each member in the alliance can be obtained by robust accounting system. Average efficiency among members in the alliance can be measured by many methods; we measure the member's efficiency by using the standard DEA model is only a particular example in this mechanism. The cost-based mechanism is advantageous to manufacturer who having huge cost in their facilities. In contrast, the efficiency-based mechanism, in which more cost brings lower efficiency, is disadvantageous to manufacturer. The cost-based mechanism indicates that more cost is occurred more profit is shared. However, such a mechanism is less helpful than efficiency-based mechanism in cost down efforts for continuous improvement. The proposed study is illustrated with a numerical example.

A Study on the Inventory and Pricing Model for Reverse Logistics: An Application on Reuse of Refillable Containers

Haw-Lieng Huang[1], Hsin Min Chen[1], Chien-Chung Lo[1]
[1]*National United University, Taiwan*

Enterprises apply reverse logistics through recycling, repairing, and remanufacturing used products into usable conditions to reduce the quantity of materials consumed and to achieve waste reduction for the environment. Hence, this paper concentrates on the recycling process of refillable containers, and proposes an inventory and pricing model to analyze the inventory levels, procurement lot-size, and the product pricing policy for recycled products. In addition, this study further develops an efficient iterative algorithm to simultaneously search for the optimal solution for the common cycle, procurement runs, and the product pricing, so as to maximize the profit of the manufacturer providing refillable products. The sensitivity analysis reveals that the fluctuation of the price discount of the returned product slightly affects the optimal price of the finished product and the optimal length of the common cycle, while it significantly influences the business profit generated from the reverse logistics process.

Wealth Effect of Technological Innovations on Supply Chains: An Event Study

Chao-Chen Hsieh[1], Jun-Zhi Chiu[2]
[1]*National Cheng Kung University, Kao Fong College, Taiwan*
[2]*I-Shou University, Kao Fong College, Taiwan*

The study conducted by the authors analyzed economic parameters related to the supply chain, in other words, test the wealth impact of the foundry that announce technology innovations (TI). And further, two key topics are including: the first one is the immediate impact of TI on the foundry's return on stock price, and the second one is its subsequent impacts on its partners on the supply chain. The results indicate that the immediate impacts of TI on foundry's return on stock price. As well as, on average, announcements of technology innovation are associated with positive excess returns. And the economic worth impacts had a relatively short time interval which is from (-10; 10) to (-2; 2) due to the technology transience over the industry.

Modelling for Dynamic Simulation of Pretreatment in Reverse Osmosis Plants

S. Syafiie[1], Fernando Tadeo[2], Luis Palacin[1], Cesar de Prada[2], Johanna Salazar[1]
[1]*Centro de Tecnologia Azucarera, Spain*
[2]*University of Valladolid, Spain*

The development of mathematical dynamical models of the pretreatment process in Reverse Osmosis plants is presented. The objective is to use the models for testing and comparison of control strategies in Reverse Osmosis plants. Thus, these models have been developed to implement them using off-the-shelf software (EcoSimPro), so that advanced control algorithms can be easily tested. During modeling, the parameters are selected to be simple to obtain from available plant measurements.

The Impact of ERP Implementation on Corporate SCM Performance: from an Operational and Information Integration Perspective

Chyan Yang[1], Yi-fen Su[2]
[1]*National Chiao Tung University, Taiwan*
[2]*National Chiao Tung University, Minghsin University of Science and Technology, Taiwan*

Increasing global cooperation and a focus on core activities have led to the notion that firms are links in a networked supply chain. Incorporating enterprise resource planning (ERP) system in supply chain management (SCM) is supposed to further enhance the effectiveness of delivery scheduling, inventory control, and increase distribution productivity among channel members. This article is, from operational and information integration perspective, to provide further insights into the relationship of implementation of ERP systems and the impacts on firm competence in SCM. A conceptual framework is proposed. The framework is featuring the ERP benefits and SCM competences. We apply structural equation model (SEM) to discover important ERP attributes leading to the success of supply chain performance. The results provide empirical evidence that the beneficial impacts of ERP on the supply chain do lead to better overall SCM competence and performance.

The Study on the Development of Inland-River Container Transportation Corridor of Yangshan Deepwater Port

Xu Zhao[1], Weijun Fei[1], Weihong Zou[1]
[1]*Dalian Maritime University, China*

Inland river shipping is one of the chief means of comprehensive transport network, and the inland river corridor, connecting to harbor port, is an important part of port transport system. Shanghai Port, the biggest comprehensive port and container port in China, is a typical hinterland-mode hub port, and its container transport system does a lot to the development of it. After Yangshan Deepwater Port Area phase-I and phase-II have been put in use, Shanghai Port has deep-water channel and berth of more than minus 15m. According to the transportation status quo of Yangshan Deepwater Port, this paper establishes Yangtze River and inland-River container transportation corridor programming model of Yangshan Deepwater, puts forward container transportation corridor programming plan, and relevant policy measures and suggestions.

The Study on Empty Containers Allocation in the Container Transportation

Ran Wang[1], Xu Zhao[1], Wenhao Yu[1], Weihong Zou[1]
[1]*Dalian Maritime University, China*

This article makes a systematical description to the process of empty containers allocation, explains the subjective and objective reason which causes the empty container allocation, the characteristic of empty container allocation and the question which exists in the practice and the actual operation of container transportation, analyzes the goal and the major effect factors of empty containers allocation. Then considering the kinds of factors which affect the allocation of empty containers, the article establishes a liner programming model which not only accord with the characteristics of empty container allocation ,but also very easy to apply to shipping practice, and carry on a calculation and analysis to the liner programming model. Finally, in view of the reasons which cause allocation of empty container, put forwards several countermeasures to reduce the cost of empty container allocation.

Critical Factors for SMEs Innovation Performance in Innovation Networks

Jin Chen[1], Xiangzhen Yu[1], Wangfang Li[1], Xiaozhou Fu[1]
[1]*Zhejiang University, China*

This paper studies the critical factors that SMEs should pay attention to when they managed their innovation networks to improve their innovation competences. We investigated 105 SMEs distributed in different industries with most of them in manufacture industry and got 204 valid questionnaires. The survey results show that there are 4 factors which influence SMEs innovation performance, i.e. partner selection, trust, CEO's commitment, and information technology. In these four factors, trust is the most important factor followed by partner selection.

The Study of SVM Optimized by Culture Particle Swarm Optimization on Predicting Financial Distress

Jianguo Zhou[1], Tao Bai[1], Jiming Tian[1], Aiguang Zhang[1]
[1]*North China Electric Power University, China*

In this paper, we applied Culture Particle Swarm Optimization algorithm (CPSO) to optimize the parameters of SVM. Utilizing the colony aptitude of particle swarm and the ability of conserving the evolving knowledge of the culture algorithm, this CPSO algorithm constructed the population space based on particle swarm and the knowledge space. The two spaces evolved independently, at the same time, the population space continuously transferred the evolving knowledge to the knowledge space, and then the knowledge space to achieve global optimization. Additionally, the proposed CPSO-SVM model was test on the prediction of financial distress of listed companies in China. Then we compared the accuracies of CPSO-SVM with other models (Standard SVM, PSO-SVM and PSO-BPN). Experimental results showed that CPSO-SVM performed the best prediction accuracy and generalization.

Cooperative Stock Document Mortgage Financing Game under Inhouse Consignment Structure

Yuanyuan Zhang[1]
[1]*China University of Petroleum at Beijing, China*

At present, the bank is facing a challenging design problem of credit contract based on inventory financing. The paper studies credit contracts based on stock document mortgage with two risk-neutral gamers under the outsource structure of inhouse consignment. The model includes the case of a bank offering loan to a cooperative retailer who mortgages its inventory to the bank to finance more inventory. The retailer faces a random demand in a single sales season as in the classical newsvendor problem. By game theorem, the paper gives the optimal loan to value to retailers with different initial capital in the case that the salvage price is smaller than the storage cost. We show the wholesale price, the storage cost and the salvage price have influence to bankruptcy risk and loan to value, as well as the initial capital. Finally, based on our model analysis, we give some advices.

Concept Selection for Market Potential Using Fuzzy Selection Approach

Wen Feng Lu[1], Jie Sun[1], Han Tong Loh[1], C. W. Chua[1]
[1]*National University of Singapore, Singapore*

One of the biggest challenges in product development is to select the product concept with the best market potential. In this work, a selection methodology is developed utilising fuzzy logic. It is an amalgamation of Pugh matrix and utility scoring approach, with the crisp numerical weights and comparison ratings replaced by linguistic fuzzy functions. Experimental results show that the proposed method can effectively perform concept selection in product development process. This method has the potential to identify the strengths and weaknesses of a few candidate concepts and consider the possibility of adopting the strong aspects and improving on the poor ones.

Session	Systems Modeling and Simulation 2
Date	12/11/2008
Time	09:00 - 10:30
Room	Venus 2
Chairs	Krishnaswami Srihari, Sridharan R

Optimizing the Selection of Product Recovery Options
Hendrik Lamsali[1], Jiyin Liu[1]
[1]*Loughborough University, United Kingdom*

This paper investigates the problem of optimizing product recovery options within the reverse logistic context. A linear programming model is developed to find optimal allocation of returned products in different quality classes to certain recovery options. The objective is to maximize the profit. Qualities and quantities of returned products, demands and prices of the recovered products, costs for recovery are all considered in the model. The model is used to examine the effects of flexibility in product recovery allocation. Computation results show that flexible allocation between the returned products in different quality classes and the recovery options are beneficial.

Evaluating the Layout of the Emergency Department of a Public Hospital Using Computer Simulation Modeling: A Case Study
Mohammad Khadem[1], Hamdi Bashir[1], Yasin Al-Lawati[1], Fatma Al-Azri[1]
[1]*Sultan Qaboos University, Oman*

Facilities layout represents one of the most significant opportunities for expanding and improving the performance of any system including healthcare. This paper reports on work done to evaluate a revised layout of the emergency department of a public hospital. The objectives of revising the layout were: 1) improving patient satisfaction through minimizing patient waiting time, and 2) expanding the capacity of the department. Medmodel was selected as a simulation tool for modeling and simulating both the existing the revised layouts. The results showed that by implementing the revised layout, the average waiting time of a certain category of patients reduced 75% and the capacity of the department increased 10% per month.

Kriging Model with Modified Nugget Effect for Random Simulation with Heterogeneous Variances
Jun Yin[1], Szu Hui Ng[1], Kien Ming Ng[1]
[1]*National University of Singapore, Singapore*

Random simulation with heterogeneous variance is a common phenomenon in real-world simulation cases. Most of the current meta-models assume homogeneous variances and hence are unable to provide satisfactory estimations of these models. This article presents a new kriging model with modified nugget effect, which accounts for heterogeneous variances in simulations. The new model can reduce the influence of noise with heterogeneous variance by incorporating local variance information into the model. A theoretical explanation and numerical experiment will be shown to provide clear illustration of this new modified model.

Organisational Readiness and Its Impact on ERP Acquisition: A Longitudinal Study of an Indian Dairy Processing Unit
Harekrishna Misra[1]
[1]*Institute of Rural Management Anand, India*

ERP Systems acquisition is an organisational issue since it brings in a new environment. This not only changes the way process is handled (process re-engineering), but also influences the organisation's culture and people. ERP imposes technology-driven environment with an aim to enhance process productivity, information integration and user interfaces. Research indicates many ERP projects still "fail to deliver" results due to organisational complexities instead of commonly perceived technology dimensions. In this paper a framework is discussed to understand the "readiness" in an organisation. An ERP acquisition is said to be successful if it is put to effective use and benefits are achieved as expected. Organisation's "readiness" is essential to manage these issues and the "readiness" should be well planned before initiation of ERP systems acquisition. The framework is applied to a dairy processing unit over a period of time during which ERP system was acquired and impact of "readiness" is observed.

Monsoon Risks for Construction Sites in India
Himadri Guha[1], Partha Pratim Biswas[1]
[1]*Jadavpur University, India*

Monsoon is a major weather phenomenon and has a substantial impact on construction activities in India. In this paper an attempt has been made in developing a frame work for objective assessment of the impacts of monsoon for building works. A study has been made for a housing project which were at various stages of constructions during the monsoon. Time and cost data were collected from the contractor. Extra time for items like foundations which are sensitive to monsoon are assessed with reference to the existing weather records. Monte Carlos simulations were conducted to assess the impacts of time and cost that could be attributed to monsoon. It has been found that the monsoon has increased the project duration by about 5 % and the cost by 12 %. The study indicates that specific planning for monsoon impact for each project is a worthwhile proposition in cities like Kolkata, India

Formulation of the Size and Position of Spiral Cooling Channel in Plastic Injection Mold Based on Fluent Simulation Results
Ir Fauzun[1], M. Hamdi[2], A. E. Tontowi[3], T. Ariga[4]
[1]*University of Malaya, Gadjah Mada University, Malaysia*
[2]*University of Malaya, Malaysia*
[3]*Gadjah Mada University, Indonesia*
[4]*Tokai University, Japan*

This paper presents a formula based on simulation results using Fluent software to determine the size and position of a spiral cooling channel in a plastic injection mold that yields the maximum effect on the ratio of product cooling rates and coolant pumping energy (CR/PE). In this formulation, there are 5 simulation steps performed: Re, Ac/Ap, Lc/Lp, rca/rp and kmold. The formula was developed by doing a step-by-step optimization using the CR/PE parameter on the simulation results by considering uniformity of product temperature during cooling (U). By performing mathematical processing on the optimization results, we obtained a targeted formula with product dimension and mold thermal conductivity as entry variables. The validity of the formula is supported by the fact that it was developed from simulation results that have fulfilled convergence criterion, a high percentage correction factor (above 97%) for all interpolations performed and a good level (approximately 96%) in the uniformity.

Session	Systems Modeling and Simulation 3
Date	12/11/2008
Time	11:00 - 12:30
Room	Venus 2
Chairs	Harekrishna Misra, Szu Hui Ng

Optimization of Operator Allocation in a Large Multi Product Assembly Shop through Integrated Computer Simulation and Genetic Algorithm

Ali Azadeh[1], Vahid Ebrahimipour[1], Sahar Tadayon[1]
[1]*University of Tehran, Iran*

This study presents an integrated computer simulation and genetic algorithm for optimizing operator allocation in some workstations to maximize production throughput in a large multi product assembly shop .At first, computer simulation is used as an exquisite tool for modeling and analyzing the true performance of the system. Then, Genetic Algorithm (GA) is used to maximize throughput of the system. In the other words, optimal number of sub-station operators is found using GA such that the throughput is maximized. The results show that for having the maximum throughput we must allocate 4, 2, 3 and 3 operators to stations 11, 12, 13 and 15, respectively. We achieve the result with less frequency by integrating GA and computer simulation. The results of this study shows that the integrated GA simulation is ideal to be applied for problems with several numbers of parameters and variables and complex objective function.

The Impact of Storage Block Assignment for Import Containers on Agv Dispatching in Highly Automated Seaport Container Terminals

Rico Gujjula[1], Hans-Otto Günther[1]
[1]*Berlin Institute of Technology, Germany*

In automated seaport container terminals like the CTA in Hamburg or the ECT in Rotterdam automated guided vehicles (AGV) are used to transport containers from quayside to yard and vice versa. The assignment of AGVs to transportation jobs, the so-called AGV dispatching, is one of the key problems in quayside transportation logistics. The impact of storage block assignment on AGV dispatching has been neglected so far in the literature. In this paper this impact is analyzed by means of simulation. It can be shown with the help of three storage block assignment strategies that the impact depends on congestion at the storage blocks and AGV travel time.

Effect of Part Launching Decisions on the Performance of a Flexible Manufacturing System: A Simulation Study

O.A. Joseph[1], R. Sridharan[1]
[1]*National Institute of Technology Calicut, India*

This paper investigates the effect of various part launching decisions on the performance of a Flexible Manufacturing System (FMS). A typical FMS configuration has been developed for the purpose of experimentation. The parts to be processed in the system are known at the beginning of the scheduling period. Each operation of a part type can be performed on one or two (primary and secondary) or three (primary, secondary and tertiary) different machines depending on the routing flexibility level present in the system.. Different levels of penalties (increased processing times) are considered for the alternative machines. A discrete-event simulation model is developed. The scheduling decisions considered are launching of parts into the system (part launching decision), routing of parts through various machines (part routing decision) and sequencing of parts for processing on machines (part sequencing decision). These decisions are handled by using various scheduling rules. The performance of the FMS is evaluated by using measures such as mean flow time, mean tardiness, makespan and mean machine utilization.

Development and Application of a Metaheuristic Optimization Procedure Integrated with Simulation for a Bus Transit System

Omar Bataineh[1], Hamzeh Abdulla[1], Ahlam Abu-Saif[1]
[1]*Jordan University of Science and Technology, Jordan*

A metaheuristic optimization procedure integrated with discrete event simulation (DES) is proposed in this work for improving the performance of transit systems typically characterized with long delays and low efficiency. The procedure is applied to the operation of the bus fleet owned by Al–Oroba Transportation Company in Amman, Jordan as a case study. The actual fleet operation is modeled and simulated using ARENA® software. Two key performance indicators (KPIs) are defined to validate the developed model and to characterize system performance; namely the bus activity ratio (BAR) and the average waiting time in the queue (AWT). Improvement in system performance was achieved by proposing new operation policies and optimizing the number of buses and ticket cashiers in the system subject to bound constraints. Aiming at maximizing the net profit, an optimal solution was reached at a total number of buses of 28 and one ticket cashier in the system. Simulation values of BAR and AWT parameters were improved by as much as +88.9% and -35.6%, respectively, compared to the actual system.

Performance of a Flexible Manufacturing System Operating Under Part Movement Policy and Tool Movement Policy: Simulation Modelling and Analysis

Suresh Kumar N.[1], R. Sridharan[1]
[1]*National Institute of Technology Calicut, India*

This paper focuses on the simulation studies conducted to evaluate the performance of a flexible manufacturing system (FMS) operating under two different scenarios: part movement policy and tool movement policy. A typical configuration of FMS is considered for the purpose of experimentation. A discrete-event simulation model of the FMS is developed for each of the two scenarios. A number of scheduling rules are incorporated in the simulation model for part scheduling decision. The performance measures considered are mean flow time, mean tardiness, percentage of tardy parts and mean utilization of machines. The simulation results are subjected to statistical analysis. For the FMS considered in the present study, tool movement policy is found to perform significantly better when compared with the part movement policy.

Session	Project Management 2
Date	12/11/2008
Time	09:00 - 10:30
Room	Jupiter 1
Chairs	Ronald Beckett, Volker Grienitz

Project Management Trends in IS Development: A Study of the IT Sector in China
Younes Benslimane[1], Zijiang Yang[1]
[1]*York University, Canada*

Focusing on formal project management initiatives (PMIs) in the information technology (IT) sector in China, this paper first examines possible differences in perception about such PMIs between IT professionals who were exposed to their implementation and those who weren't. This part of the investigation is based on an adaptation of Rogers' theory of diffusion of innovations. Second, this paper examines the implementation of PMIs and their possible effect on IT projects. This part of the investigation focuses on "inside" project management risks and performance. Findings from a survey of 82 senior IT professionals show some differences in perception between the two groups of respondents. Findings show also that organizations that have implemented PMIs tended to better control the "inside" risks related to the management of IT projects and to report higher performance levels on such projects. The implications for research and practice are discussed.

A Royalty Negotiation Model for BOT Projects: A Bi-level Programming Approach
Chao-Chung Kang[1], Cheng-Min Feng[2], Chiu-Yen Kuo[2]
[1]*Providence University, Taiwan*
[2]*National Chiao Tung University, Taiwan*

This study develops the royalty negotiation model of BOT (Build, operate, and transfer) projects for government and private sector by Bi-level programming approach. There were few studies to explore the royalty negotiation about BOT projects; however, the royalty negotiation is one of many critical negotiation items of concession contract. This study not only develops royalty negotiation model for BOT projects, but also develops the heuristic algorithm for the Bi-level programming problem. The factors of concession rate, time value discount, learn rate and number of negotiation are incorporated into this algorithm. In addition, this paper conducted a case study with the Taipei Port Container Logistic BOT Project by the LINGO and MATLAB programming. Results show that two parties finish the royalty negotiation at the 6th negotiation and the profit index of concessionaire is 1.0621; the government finance recovery rate is 11.689. Therefore, the royalty negotiation model herein developed could be applied to explain the negotiation behavior.

Fuzzy Group Decision Making: A Case Using FTOPSIS in Mega Project Risk Identification and Analysis Concurrently
S. M. H. Mojtahedi[1], S. M. Mousavi[1], A. Aminian[2]
[1]*Islamic Azad University South Tehran Branch, Iran*
[2]*Islamic Azad University Gachsaran Branch, Iran*

This study aims at improving the quality and effectiveness of decision making in project risk management. Conventional approaches to risk identification and risk assessment separately tend to be less effective in dealing with the imprecise of the risk assessment individually. In order to solve this problem, project manager need to evaluate their problem including both quantitative and qualitative criteria and to make accurate decisions. For this reason, a systematic decision process for identifying and analyzing risks concurrently by applying Multi Attribute Group Decision Making (MAGDM) in fuzzy environment is proposed. The paper introduces a new procedure for classifying potential risks. Obtained results have been applied in one mega project successfully.

An Incremental Approach for Temporal Analysis in Networks with Imprecise Activity and Time Lag Durations
Siamak Haji Yakhchali[1], Hassan Ghodsipour[1], S. M. T. Fatemi Ghomi[1]
[1]*Amirkabir University of Technology, Iran*

This paper proposes algorithms for computing the possible values of the latest starting times and maximal floats in a network with imprecise activity and time lag durations, represented by means of interval or fuzzy numbers. Although these problems have been solved when the activity durations are imprecise, we propose polynomial algorithms which can handle the imprecision in time lags of the precedence relations and are simpler than the previously algorithms. Inserting the imprecise time lags in the network leads the proposed algorithms to be more practical. After positioning this paper in the scope of project scheduling under uncertainty, the algorithms for computing of the interval value of latest starting times and maximal floats of activities in networks with interval activity and time lag durations are proposed. Then, the interval activity and time lag durations are generalized into fuzzy numbers.

Hybrid Management Model Combining Process Management and Project Management in Local Administration
Manuel Monterrey[1], David de la Fuente[1]
[1]*University of Oviedo, Spain*

An organization such as a Local Economy and Employment Promotion Agency (LEEPA) needs a proper management system enabling tangible results to be obtained. Even so, it has made great progress in the implementation of continuous quality techniques by using inadequate management models due to its complex structure and status as a public entity. Thus it has a high number of indicators which only cause greater difficulties when it comes to establishing conclusions, and management is oriented towards processes when the usual working method is project management. In this paper, the main features of a series of models have been described and their application to the LEEPA has been analyzed by seeking the deficiencies and proposing or designing improvements. The final aim has been achieved by the definition and use of the so-called Single Employability Indicator; a single parameter from which to obtain conclusions concerning the financing of the whole Organization. The drafting of a new Process Map in accordance with the LEEPA's activity has made integration of the models studied necessary by obtaining a hybrid model of Process Management and Project Management.

Progress in Large-shared Projects: Method for Forecasting and Optimizing Project Duration in a Distributed Project
Rameez Khalid[1], Philippe Duquenne[1], Alain Hait[1]
[1]*Université de Toulouse, France*

In large-shared projects, it is still difficult to measure progress due to the complexities involved, because the realization is shared among departments of a company or among companies in the world. Project management and operations research literature is reviewed for discovering various techniques applicable. Widely used tools for progress measurement and forecasting, such as Earned Value Analysis, Progress Plot, Milestone and Resource slip charts, concurrent engineering, can be employed. This paper is based on a problem of pharmaceutical industry where the effectiveness of a certain medical treatment is examined on patients in a number of countries. The number of variables involved increase the complexity of this problem. The main objective is to analyze the effectiveness of a solution in different situations during the project such that a better project duration and a lower cost can be achieved. Our findings suggest that reallocation of patients among countries produces better results in terms of progress.

Session	Project Management 3
Date	12/11/2008
Time	11:00 - 12:30
Room	Jupiter 1
Chairs	Thomas Frisanco, Ronald Beckett

Process Management System for the Integration of Situation Dependent Process Planning
Wolfgang Lauer[1], Matthias Faerber[2], Julia Roelofsen[1], Florent Jochaud[2], Stefan Jablonski[2], Udo Lindemann[1]
[1]*Technical University of Munich, Germany*
[2]*University of Bayreuth, Germany*

Today's complex products and development processes require the engineer to consider an increasing variety of influencing factors like the current design situation or the available information. Though recent enhancements of process management systems show progress with administrative and production workflows, the support of highly iterative, flexible and unpredictable product development processes has not been solved yet. Hence, the presented research proposes a novel process management system which considers the design situation of an engineer and his/her information needs in particular. Based on a project control circle which describes the proceeding in a development project in general, the design situation and the product models are described by corresponding parameters to define the situation and the most relevant product models for the execution of the task. Finally, the implementation of both aspects is explained by using the developed data schema.

Correlation Analysis between Maturity Factors and Performance Indexes in Software Project
Xiangnan Lu[1], Lang Shu[1], Jie Li[1]
[1]*Zhejiang University, China*

Software development inclined to production of scale, criterion and industrialization, with the development of information technology and software industry. Different kinds of Project Maturity Models for enhancing performances of software development were broadly exploited and used factually.

Based on literature review and enterprise research this paper put forward 30 main factors which cover in three aspects of technology, organization and personnel. At the same time, the author classified the software development performance estimation indexes into five geniuses: quality, satisfaction, knowledge, control, and efficiency index. Recurring to large-scale questionnaire research, the author also applied SPSS statistic instrument consisted of gene analysis, correlation analysis and regression analysis to analyze the relationship between maturity factors and performance indexes. The results indicated that close connections between the project performance and different maturity factors affected the project performance to a certain extent.

Organizing Project-Based Group Communication Events: A Macro Perspective
Chung-Yang Chen[1], Pei-Chi Chen[2], W.L. Tsai[1]
[1]*National Central University, Taiwan*
[2]*Trend Micro Incorporated, Taiwan*

Communication, often conducted in the form of meeting, is critical to the success of collaboration in project-based and human-intensive business activities. This paper reviews current literature in the areas of group and organizational communication and argues the need of (1) a holistic perspective in planning and organizing project-based group communications, (2) establishing and sustaining a continuous venue for communication, and (3) taking advantage of meetings and introducing the meeting-flow (MF) concept to facilitate the macro-level planning of communication and its venue.

A Neuro-Fuzzy Approach to generate Customer Satisfaction Model for New Product Development
C. K. Kwong[1], T. C. Wong[1]
[1]*Hong Kong Polytechnic University, Hong Kong*

Understanding Customer perception towards any consumer products is of extremely important to design teams for designing new products. It is because success of new products is heavily dependent on the associated customer satisfaction level. If the consumers are satisfied with a new product, the chance of the new product to be successful in a marketplace would be higher. In this study, we applied Adaptive Neuro-Fuzzy Inference System (ANFIS) method to generate customer satisfaction models based on market survey data. In this paper, a modified ANFIS (M-ANFIS) is proposed by which explicit customer satisfaction models can be generated. The models can efficiently deal with continuous input values instead of crispy numbers. To justify the goodness of M-ANFIS, it was compared with a well-known statistical method, Multiple Linear Regression (MLR). Experimental results indicated that the M-ANFIS outperformed MLR in terms of mean absolute errors and variance of errors.

Robust Design for Optimal Project Management with Reliability and Cost
Angus Jeang[1]
[1]*Feng Chia University, Taiwan*

An approach which combines PERT and CPM in one model to solve project scheduling problems, is introduced. Due to the stochastic nature of activity time and cost for PERT and CPM networks, robust design for project scheduling via statistical method is introduced in the presented approach. The statistical method, such as response surface methodology (RSM), is used to develop a rationale of the time-cost tradeoff problem. Since the character of stochastic networks is considered in this study, other than the deterministic values of completion time and total cost, the probabilistic values of completion time reliability and total cost reliability are also considered as response values for statistical optimization. The results indicate that the presented approach provides an efficient and practical means in finding the robust and optimal scheduling for project management problem.

Development of Joint Venture Partner Capabilities Assessment Model: The Case of Eskom Enterprises, South Africa
Michael Kachienga[1]
[1]*University of Pretoria, South Africa*

One of the main challenges in joint ventures collaboration is how to assess partners' capabilities so as to have a win-win business venture. The success of a joint venture depends on the technological, financial and cultural synergy created by individual contributions of partners. Experience shows that it is easy to achieve financial parity in terms of capital outlay, but rather more difficult to achieve strategic parity in terms of technological and human capital investments.
This paper discuses the joint venture partner model for partners' capabilities assessment. The focus will be on assessment of the partners' technological capabilities. For clarity, a single partner capabilities assessment is discussed, the modalities of assessment are explained, and the case study of Eskom Enterprises (EE) (Pty) Ltd and an African power sector is discussed.

Session	Supply Chain Management 4
Date	12/11/2008
Time	09:00 - 10:30
Room	Jupiter 2
Chairs	Ana Paula Barroso, Adam T.S. Ng

Integrated Model for Sustainable Development
Vineet Varma[1], Gopinath Chattopadhyay[1]
[1]*Central Queensland University, Australia*

The growing human population has put an ever-increasing strain on world resources. This is causing a severe imbalance on human lives and the flora and fauna of the world. Human activities in areas such as mining, deforestation, urban development and industrialization have created an adverse impact on environmental, social and economic stability of companies and countries. This paper will take an integrated and holistic approach to address these problems and focus on deriving the maximum value from a bundle of available resource to enhance sustainability. It would consider 'Lean Methodology', to improve the efficiency and effectiveness of the business. This is extended to address the financial, economic, social and environmental aspects at a macro level for achieving sustainability and a higher quality of life.

RFID-Enabled Aerospace Manufacturing: Theoretical Models, Simulation and Implementation Issues
Khir Harun[1], Kai Cheng[1], Marco Wibbelmann[1]
[1]*Brunel University, United Kingdom*

Radio frequency identification (RFID) is gaining significant interest from the aircraft manufacturing industry. It has become an increasingly recognized technology, with its real time tracking ability at a much greater level of accuracy, and provides more value across a supply network. RFID-enabled technology with an associated system structure has emerged to provide solutions which apparently close the gap between the physical flow of materials and the information flow in the production system. As manufacturing supply chains rapidly enter the virtual world of the networked RFID system, their information systems are sharing the fundamental information that require intelligent tracking and tracing performance. This paper discusses broad issues inherent in aircraft parts manufacturing with various applications including regulatory and quality requirements, production planning and control, product traceability, inventory management, and labor productivity. A theoretical model with generic RFID framework is presented. The framework is then applied to an aircraft part manufacturing process with associated decision cost factors as a case study.

Location-Routing Based Dynamic Vehicle Routing Problem for Express Pick-Up Service
Ming-Der May[1], Chan-Yu Tu[1]
[1]*Lung Hwa University of Science and Technology, Taiwan*

This study has two major issues: (1) Expanding Dynamic Vehicle Routing Problem into Location-Routing based model with single hub and intermediate transfer points that can be relocated in real time according to customer's positions and the situation of the regional pickup demands; (2)Solve this model by optimization procedure and evaluate computing efficiency with some proposed test problems.

Exact Evaluation of a Two Sourcing Supply Chain with Order Splitting and Information Sharing
Mehdi Sajadifar[1], Amir Mahdi Hendi[1], Rasoul Haji[2]
[1]*University of Science and Culture, Iran*
[2]*Sharif University of Technology, Iran*

We consider a single item, two-level inventory system which consisting of two suppliers and one retailer. Transportation times are constant. The retailer faces Poisson demands and applies continuous (R,Q) policy. Each supplier starts with m initial batches of size Q/2 and places an order in a batch of size Q/2 to an outside source immediately after the retailer's inventory position reaches R+s. In this paper using the idea of the one-for-one ordering policy, we derive the exact value of the expected total cost in the convergent coordinated supply chain.

Realizing Instant Customerization Through Proactively Enhancing Demand Visibility
Zhongjun Tang[1], Xiaohong Chen[1], Jing Xiao[1]
[1]*Central South University, China*

Despite of an increasing trend towards a new manufacturing paradigm 'instant customerization', there is a lack of research into its feasibility. To examine the feasibility to implement instant customerization, this paper proposed a demand-supply chain model, which include five linkage points between demand and supply chains. The model may provide a set of systematic approaches to analyze the possibility of innovative operations and production illusions, and provide requirements to implement the innovative operations and production tactics. By means of the model, a feasible zone and two kinds of tactics to implement instant customerization are elicited and described at a general level. The key kind of tactic is to proactively enhance demand visibility.

A Method of Bottleneck Control in Build-to-order Supply Chain
Yimin Xu[1], Shihua Ma[2]
[1]*Huazhong University of Science and Technology, Guangdong University of Technology, China*
[2]*Huazhong University of Science and Technology, China*

Build-to-order (BTO) supply chain is a successful pattern for satisfying end customer needs. But the present product control strategies and methods like JIT are difficult to work in BTO supply chain. In this paper, a new theoretic approach to bottleneck identification in BTO supply chain is introduced. The approach is combined with the theory of constraints and input/output control. Using this approach, bottlenecks are defined, and their implications for production control are discussed. Then a production control model based on the bottlenecks is developed and analyzed. At last, a queuing model to describe the model is made.

Session	Supply Chain Management 5
Date	12/11/2008
Time	11:00 - 12:30
Room	Jupiter 2
Chairs	Carman Ka Man Lee, Ming-Der May

Coordinated Production Planning in Supply Chains
Richard Lackes[1]
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The objective of supply chain management is the improvement of the material flow between the linked enterprises by installing information systems and procedures in order to enhance the coordination in the logistic chain. Planning the production and order quantities is a fundamental and decisive process for material flows in a supply chain. Therefore the coordination of these decisions is of great importance to its efficiency. One way to improve the coordination consists in the construction of a central production planning system for the entire supply chain. This shall complete existing ones used in the diverse enterprises. Thereby the distinct scheduling systems used keep their autonomy to a large extent. Akin to "service providers" they are used by the central supply chain oriented production planning system (SC-PPS), which in this respect offers an information system that loosely links different PPS systems. The architecture, necessary for that, the needed data and the functionality are introduced and discussed.

A Review of Planning and Scheduling in the Pulp and Paper Supply Chain
Mohsin Malik[1], Min Qiu[1]
[1]*University of Western Australia, Australia*

This paper reviews the body of work on the operational planning and optimization of the supply chain in the pulp and paper industry, with an emphasis on integrated production planning and scheduling. It also discusses what appear to be the unexplored areas of its operational planning. Moreover, it gives a synopsis of the heritage of operational planning tools available and tracks the evolution of the pioneering planning methods in decision support systems of modern day.

The Impact of Uncertain Environment on Rice Supply Chain Performance in Northeast Thailand
Phatcharee Thongrattana[1], Peter Robertson[2]
[1]*Kasetsart University, Thailand*
[2]*University of Wollongong, Australia*

Rice is a key agricultural product of Thailand and plays a vital role in the Thai economy. Rice production, however, is dependent upon environmental factors. Environmental uncertainty therefore, can impact rice crop areas in term of influencing the rice yield, rice production and generating ripple effects along the overall rice supply chain. The aim of this research is to investigate the effects of uncertain rice supply caused by drought years on the rice supply chain performance in Thailand. Three stochastic simulation models in different assumptions of rough rice production situations were developed which were based on historical data of normal and drought years in northeast Thailand. The results from using iThink software indicate that periodic enormous rice production loss because of a drought year create significant problems such as fluctuating inventory levels, stock-outs and unfilled customer demand compared to rice production loss under monsoon drought probability and mean rice production.

Research on the Subdivision of Transaction Cost in Supply Chain Based on Analysis of Enterprises Relation
Xing-hui Lei[1], Ke Zhang[1]
[1]*Tongji University, China*

The competition between enterprises has been gradually replaced by that between supply chains. Nowadays, suppliers and buyers are cooperative associates and work in the competition together with each other, which used to be competitive forces. However, they are still separate units and transaction cost still exists as a prime cost between enterprises in supply chain today. Through the analysis of the factors that affect the amount of transaction cost, this paper studies the dual influence of the enterprises relation on transaction cost. Furthermore, this research separates a part of transaction cost which works as the quality guarantee value activity and we call it relation cost. By this way, we hope to decrease transaction cost in a large amount by paying relation cost in a small amount according to the theory of strategic cost management and systematic management, and ultimately to improve the competitive advantage of supply chain.

A Supply Chain Disturbances Classification
Ana Paula Barroso[1], Virginia Machado[1], Virgilio Cruz-Machado[1]
[1]*UNIDEMI, FCT-UNL, Portugal*

Nowadays, organizations and supply chains have to deal with a number of disturbances. The pressures to grow revenues, to take advantage of new technologies, to reduce costs, and to improve working capital and streamline operational procedures, pushed many organizations to establish strategies which increase risk exposure. As a result, companies can loose the ability to act quickly and effectively in response to disturbances. In this paper, different disturbances are identified and the relationship with their potential sources is discussed. A proposal for the classification of disturbances is presented; it is considered as a required step to understand how to model for better organization performance in situations characterised by high levels of exposure to disturbances.

A Simulation Study on the Impact of Forecasting Methods on the Bullwhip Effect in the Supply Chain
S. Kamal Chaharsooghi[1], HamidReza Faramarzi[2], Jafar Heydari[1]
[1]*Tarbiat Modares University, Iran*
[2]*Wilfrid Laurier University, Canada*

Bullwhip effect is undesirable in the supply chains, exacerbating its performance. Various factors can cause bullwhip effect, one of which is customer demand forecasting. In this paper, impact of forecasting methods on the bullwhip effect has been considered. A simulation study is implemented considering a supply chain consisting of one supplier and four retailers. A time series procedure (ARMA) is used as the forecasting method and is compared with two of the most applicable forecasting methods (Moving Average (MA) and Exponential Smoothing (ES)), from both bullwhip effect and forecasting accuracy point of view. Our findings show that having more accurate forecasting method is not equivalent to creating less bullwhip effect.

Session	Global Manufacturing and Management 1
Date	12/11/2008
Time	09:00 - 10:30
Room	Jupiter 3
Chairs	Jiafu Tang, Anil Verma

Alternative Value Creation Strategies in the Footwear Industry: Exploring the Role of Production Offshoring
Antonio Verdu-Jover[1], Jose Maria Gomez-Gras[1], Ignacio Mira-Solves[1], Jesus Martinez-Mateo[1]
[1]*Miguel Hernandez University, Spain*

Using a value creation perspective we analyse firms' strategies in footwear industry in Alicante (Spain). Production offshoring has been the key to enabling successful firms to survive in a sector that social agents have for decades perceived as permanently in crisis. In a period of great changes, local firms have not only fought to survive by maintaining activities with a high added value in the region but have also in some cases based their strategies on maintaining production activities in the same region in order to generate a high value for rapid response to the European Union regional market.

Evaluating the Performance of Global Telecom Operators
Wen-Min Lu[1], Shiu-Wan Hung[2], Chih-Jou Chen[2]
[1]*National Defense University, Taiwan*
[2]*National Central University, Taiwan*

In today's globalized economy, telecommuni-cations operators are facing ever-increasing competition and challenges. They need to focus on improving their performance in order to remain competitive. This study attempts to examine the managerial performance efficiency of 36 globally leading telecommunications operators by utilizing the data envelopment analysis (DEA) technique. The empirical results indicate that the scale of the operators does play an important role in influencing their operating efficiency. Telecoms can increase their performance by consolidating with other smaller units to achieve the optimal size. European telecom operators were found to perform better than those in the Asia-Pacific region and in America. The results also show that state-own telecoms operate more efficiently than privatized telecoms. In addition, the global telecoms have been ranked and the benchmarks set by using the reference-share measures. These benchmarks may give a first guideline for performance improvement of global telecommunications operators.

An Exploration of the Pre-development Phase in New Zealand Small-to-medium Enterprises
Warren Baier[1], Aruna Shekar[2]
[1]*Hansen Products (NZ) Limited, New Zealand*
[2]*Massey University, New Zealand*

Developing successful products is difficult, with few companies being highly successful more than half the time. This presents a significant challenge for a product development team. This research was aimed at exploring the pre-development phase currently employed by small and medium enterprises (SMEs) from the New Zealand manufacturing industry. The purpose was to gauge the understanding and importance of this early stage in product development amongst practitioners from these SMEs, as the literature highlighted this as an area of weakness requiring empirical research. This study involved twenty-two SMEs using a questionnaire survey followed by personal interviews with some of the participants. The study found that the pre-development phase of New Zealand SMEs lacked awareness, commitment, and formality. Difficulties were also associated with carrying out the activities, worsened by the lack of skills in-house to do so.

Research on Procedures and Model of Flexible Selection of Manufacturing Strategy Competitive Priorities
Fengjing Han[1], Chun-sheng Shi[2]
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[2]*Harbin Institute of Technology, China*

Manufacturing markets are facing a series of changes in current days ,which has made manufacturing strategy a research hotspot In the foreign business community and academia, and so do manufacturing strategy competitive priorities as an important component of manufacturing strategy. This paper designs the procedures and model of flexible selection of manufacturing strategy competitive priorities from the recognition and determination of the elements ,as well as role analysis ,to the process design of competitive priorities flexibility under different competitive strategies.

Developing a Feedback Model of Brand Development - A Case in Point of the Laptop Computer Industry in Taiwan
Chun-Fu Chen[1], Chin-Huang Lin[2], Hsin-Yun Hu[3]
[1]*Nanya Institute of Technology, Taiwan*
[2]*Chung Hua University, Taiwan*
[3]*Hsin Sheng College of Medical Care and Management, Taiwan*

The construction of capability of a brand name is of a complex system structure, and the solution to the problem heavily relies on the key issues thereof. The academic discipline of system dynamics is able to comprehensively understand the evolution of a complex system, as well as how the internal feedback loop of the system structure influences the system behavior. This study is on the construction and analysis of the dynamic structure of the brand name dynamic capability, divided into four facets, namely the flows of production, innovation, service, and marketing; actual cases or academic views will be presented for the purpose of validation. It is the discovery of the study on the brand name dynamic capability. The discussion is divided into four parts: production, innovation, service, and marketing.

SOCRADES: a Framework for Developing Intelligent Systems in Manufacturing
Alessandro Cannata[1], Marco Gerosa[1], Marco Taisch[1]
[1]*Politecnico di Milano, Italy*

Nowadays two main reasons are determining the increase of intelligent systems in manufacturing. The first one is market-driven: demand is more and more variable and mass customization is the new way to compete in manufacturing requiring feasible reconfigurable manufacturing systems. The second one is technology-push: the increasing availability of high-performance, low-power electronic components and the emerging wireless technologies are boosting the creation of intelligent systems (with personal intelligent perception, reasoning, etc.). However still research should be done in intelligent system's field. Since the complexity both of the topic and of the consequences that it can have on manufacturing domain, a framework for addressing the overall field should be defined. We propose the framework adopted in SOCRADES, a European research project exploiting Service Oriented Architecture paradigm both at the device and at the application level. Finally the impacts of SOCRADES architecture on manufacturing performance are described and motivated.

Session	Global Manufacturing and Management 2
Date	12/11/2008
Time	11:00 - 12:30
Room	Jupiter 3
Chairs	Ralph Riedel, Chengter Ho

Comparative Investigation on Green Supplier Selection of the American, Japanese and Taiwanese Electronics Industry in China

Cherng-Ying Chiou[1], Chia-Wei Hsu[2], Wei-Yi Hwang[3]
[1]*The Overseas Chinese Institute of Technology, Taiwan*
[2]*National Taipei University of Technology, Taiwan*
[3]*National Chung Hsing University, Taiwan*

This paper utilized fuzzy analytic hierarchy process (FAHP) to explore the differences of green supplier selection among the American, Japanese and Taiwanese Electronics Industry in China. In this study, identification of criteria of green supplier selection is categorized into six criteria and 24 sub-criteria, a multi-criteria decision model is proposed. FAHP then is applied to determine the relative importance for selecting green suppliers among the American, Japanese and Taiwanese Electronics Industry in China. The findings indicate that the supply chain base criterion performs the best for overall ranking from three countries' groups.

Operational Competitiveness Research of Chinese High-Tech International Manufacturing Company in Global Context

Shubin Si[1], Josu Takala[2], Yang Liu[2], Rayko Toshev[2], Zhi Tang[2]
[1]*Northwestern Polytechnical University, China*
[2]*University of Vaasa, Finland*

This paper presents a thorough case study and analysis aiming at studying operational competitiveness of Chinese high-tech international manufacturing company (CHTIMC). In this paper, some models are applied: (1)Analytic Hierarchy Process (AHP) method is used to analyze questionnaires, which are got from the case CHTIMC, of multi-focused manufacturing strategies; (2)the analytical models, which can calculate the ranking of company's operational competitiveness in prospector, analyzer and defender groups, are used to find more competitive advantages of CHTIMC;(3) benchmarking between CHTIMC and top companies of prospector and defender is applied to determine the operational competitiveness of CHTIMC further. The analysis results show CHTIMC is more dominant in prospector group; and prove the analytical models of operational competitiveness are effective.

Partial Chain based GA for Joint Inventory and Delivery Scheduling with Vehicle Rent Way

Jiafu Tang[1], Xinggang Luo[1], Jun Zhang[1]
[1]*Northeastern University, China*

A partial chain based Genetic Algorithm (PCGA) is developed to solve the integrated inventory and delivery scheduling in a distribution network where multi-products at one supplier are distributed to several retailers. The shipments of products to the retailers are subcontracted to professional transportation enterprises via vehicle-rent way. Distinguished from many other distribution models, the amount of vehicles is viewed upon as an operational decision simultaneously with the delivery schedule in the planning horizon so as to cater for quick changes in market demand. The jointly inventory and delivery scheduling problem addressed tries to determine not only the schedule of delivery (when and in what quantity each product is delivered, but also the number of vehicles required towards minimum total costs of inventory, transportation and rental costs in vehicles over the planning horizon. An example is introduced to test the efficiency of the method and sensitivity analysis is conducted also in the paper。

Resource-Configurations for Manufacturing Networks: Matching Plant Capabilities to Product Value

I-Chen Wang[1]
[1]*University of Illinois at Urbana-Champaign, United States*

Extending from the resource-based view, diverse capabilities of manufacturing plants represent heterogeneous resources, which, coupled with product characteristics, affect performance. Using a three-way classification, we propose that 'pilot' plants provide strategic value through product development effectiveness, 'contributor' plants are conducive to efficiency in process improvement, and 'source' plants provide cost competitiveness.

Knowledge Sharing for Strengthening Manufacturing Operation and Business Performance

Tsu-Te Huang[1], Rodney Stewart[1], Le Chen[1]
[1]*Griffith University, Australia*

Manufacturing companies have strived to enhance managerial and technical capabilities to improve business performance. Building these capabilities requires effective share of knowledge – the strategic resource. Specifically, knowledge sharing (KS) between different manufacturing departments can improve manufacturing processes since leveraging organisational knowledge plays an enssential role in achieving competitive advantage. This paper presents an empirical investigation into the impact of KS on the effectiveness of supply chain management (SCM) and the product development process (PDP) in achieving desired business performance (BP). A questionnaire survey was administered from electronic manufacturing companies operating in Taiwan. 168 valid responses were received and used to statistically examine the relationships between the concepts (SCM, PDP, KS, BP). The study findings reveal that within the Taiwanese electronic manufacturing companies KS is an essential enabler for facilitating the effectiveness of SCM and PDP in achieving desired BP.

Session	Human Factors 1
Date	12/11/2008
Time	09:00 - 10:30
Room	VIP Room
Chairs	Masahiro Aruga, David de la Fuente

A Qualitative Study in Consumer Behavior of Skype Internet Phone

Chia-Chen Yen[1], Jih-Shih Hsu[1]
[1]*National Yunlin University of Science and Technology, Taiwan*

Various Internet applications have mushroomed for years in many different fields, but only few of them survive in the market. One of them is the Internet phone service which has been available since 1995. Recently, this market has shown fast development in terms of many new value-added services offered and an impressive increase in the number of users all over the world. This paper aims to investigate why certain products subsist while varied substitutes exist in the same field. A qualitative approach was used to explore the consumer behaviors of Skype Internet phone and compare the schema changes of Skype users and non-skype users in the same periods. Concluding from the result of qualitative study, the findings indicate the social influences are the most important factors that affect customer behaviors of Skype Internet phone. The model of this paper is not only suitable for Internet applications but also can be extended to survey diverse products in different areas.

Research on Cooperative Game Model of Ship Owner and Seafarer

Xu Zhao[1], Shuang Zhang[1], Wei Zhang[1], Weihong Zou[1]
[1]*Dalian Maritime University, China*

The paper aims to create a cooperative game model and its equilibrium point to describe the inside distribution policy and outside running behavior of shipping enterprise, basing on modern enterprise theory, expect utility theory and the game theory, to analyze the development of shipping enterprise' structure. The model demonstrates that the inside distribution of shipping enterprise is proportional to the attitude of game participators to the risks in outside market environment. Besides, price strategy, as shipping enterprise's major market behavior, will change accordingly with the enterprise cost and inside distribution policy. The conclusions from the model explain the shipping enterprise's market behavior, such as enterprises gain the competitive advantage of scaled operation by reducing cost. It also gives some suggestions for shipping enterprises in China, such as the salary system of seafarers should be geared to the international standards sooner, etc.

A Multi Objective Approach for Selecting Solutions to Improve Job Satisfaction - An Empirical Case Analysis

Vahid Baradaran[1], Shohreh Ghadami[2], seyyed ehsan malihi[3]
[1]*Islamic Azad University Tehran North Branch, Iran*
[2]*Sazeh Gostar Saipa, Iran*
[3]*Tarbiat Modares University, Iran*

Extensive studies have shown that improving job satisfaction increase firm performance. Thus firms have a great interest in finding effective solutions to improve their employees' job satisfaction. To this end, we use Multi objective model to select effective solution for improving job satisfaction in our case. Five components of job satisfaction were revealed as a one of the objective functions by principal component analysis, and the effective solutions were determined by using multi objective analysis.

Automatic Feature Extraction from Front and Side Images

Yueh-Ling Lin[1], Mao-Jiun Wang[1]
[1]*National Tsing Hua University, Taiwan*

This paper presents a systematic method to detect feature points on the silhouette of human body from front and side images. Based on the correspondence between the coordinates and the eight numbering system of chain codes, we use the codes that depicted at 90 degree angle as corner points. The system then connects the other associated points horizontally and vertically. Thus, the human landmark positions of head, neck, shoulder, chest, waist, hip, thigh, knee, shank, ankle, and foot can be identified by the relationship between two correlative points. A total of 55 feature points and 26 body measurements can be extracted automatically. The method has been tested on four human subjects and all were correctly extracted.

Risk Bayesian Assessment Approach to HOF-based Ship Operation in Harbour

Shenping Hu[1], Cunqiang Cai[1], Quangen Fang[1]
[1]*Shanghai Maritime University, China*

Marine accidents were mostly caused by the human errors, and it is important to emphasize the research about the human elements for the safety of ships. Risk based on human organization factor (HOF) associated with vessel operation system at sea are analyzed according to the elements in this system and a new method of proposed risk assessment is developed to ensure safe ship operation including the framework, content and procedure. Based on Bayesian method, Bayesian estimation, learning, reasoning and decision-making are established for the quantitative risk assessment (QRA) of vessel operation system at sea. After the analysis on occurrence probability of accidents related to ship pilots in harbour, a thorough procedure about proposed risk assessment on the basis of Bayesian method is developed to obtain the QRA of their relative distributions. The distributions of ship operation are described and results are presented on QRA in relation to various features. This method, verified in the cases of QRA, turns out to be feasible in the application of risk assessment.

Japanese Tourists' Perceptions of Shopping at Taiwan Night Markets

Chia-Ching Tu[1], Dian Yan Liou[2]
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[2]*Yu Da College of Business, Taiwan*

From theoretical viewpoints, analyses of consumer motivation have been applied to the shopping and the tourism industry for decades. The objectives of this study are to understand tourists' motivations and their preferred leisure activities when they shop in Tourist Night Markets. The unit of analysis is the Japanese tourist. According to the research results, novelty-seeking, experiencing local culture and customs are the major factors that motivate Japanese to shop in Tourist Night Markets. The results also reveal that product-related attributes and novelty-seeking are significant tourist perceptions of leisure shopping. Existing problems in Taiwan Tourist Night Markets perceived by Japanese tourists are environmental sanitation, parking and traffic issues. On the whole, Japanese tourists had the most negative image on environment amenities of Taiwan Tourism Night Market whether they visited or not.

Session	Human Factors 2
Date	12/11/2008
Time	11:00 - 12:30
Room	VIP Room
Chairs	Vahid Baradaran, Mohammad Khadem

An Ergonomics Intervention Study of Reducing Health Complaints among Office Employees
Ashraf Shikdar[1], Mohammad Khadem[1], Salim Al-Harthy[1]
[1]*Sultan Qaboos University, Oman*

The objective of this study was to determine the effects of alternate methods of ergonomics intervention in the office environment of an oil refinery company in Oman. A year long study was conducted on a sample of 40 representative employees of the company. The employees were randomly divided into four groups and assigned to four experimental conditions. A Checklist developed for the evaluation was administered before the intervention and six months after the intervention with ergonomics conditions. The result showed a significant reduction in health complaints such as backache, headache, shoulders and neck pain in groups with an ergonomics intervention. The investigation showed that ergonomic facilities along with ergonomics training was significantly better than providing only ergonomics training or ergonomics facilities alone. This type of research will have immense implications for managers who are interested in improving worker productivity, health, safety and satisfaction in work environment where computers are used intensively.

A Human Factor Fault Tree Analysis Method For Software Engineering
Yanyan Zheng[1], Renzuo Xu[1]
[1]*Wuhan University, China*

Human Factor Analysis has realistic and profound significance to improve the quality and reliability of software. However, there is little research on the methods applied in software engineering to analyze human error. This paper proposes a human factor analysis method, which applies the fault tree analysis method to seek the human factor causing software accidents. Fault tree analysis method brings great flexibility and it is a graph deduction, which makes it easier to find the critical links of human errors.

Rating Consistence of Color Combinations for Aesthetic Preference, Legibility and comfort for Small Icons
Shih-Miao Huang[1]
[1]*National Formosa University, Taiwan*

This study tried to explore the correlations between aesthetic preference and perceived usability of color combinations. The evidence showed that most color combinations had lower aesthetic rating consistence, and few ones had extremely higher rating consistence between subjects. Next, the rating consistence of aesthetics for color combinations was lower than that of legibility and comfort. Finally, the correlations between aesthetic preference rating and legibility and comfort, respectively, were not very high. However, the argument that aesthetic preference ratings were correlated with perceived usability would be satisfied when the rating consistence for all aesthetic preference, legibility and comfort color combinations are much higher.

The Consideration of the Partial Differential Equations and the Information Transmitting Structure as the Background of the ABR Derivation and Characteristics
Masahiro Aruga[1], Shuichiro Ono[1], Kiyotaka Takagi[1], Tsukasa Sato[1], Shuichi Kato[2]
[1]*Tokai University, Japan*
[2]*Teikyo Heisei University, Japan*

The characteristics of ABR (ABR: Auditory Brainstem Responses) are well known to be widely used on many fields, and especially they are having been adapted on the medical and clinical fields. Although the ABR characteristics and the derivation models have been discussed and presented, the details of the ABR system are not sufficiently analyzed. In this paper the partial differential equations are discussed as the background equation formulas of the ABR characteristics and the meaning of characters among the partial deferential equations is considered and an ability of improvement of them is estimated, then a method of it is proposed. And using the synthesis method an inverse procedure of analysis of the ABR models is proposed and the estimation of the information transmitting relation among the Peirce's interpretants (though these elements are in the idea of philosophy) is performed from the real physiological side of this ABR characters.

Ordinal Logistic Regression for Affective Product Design
Feng Zhou[1], Du Wu[2], Xi Yang[1], Jianxin(Roger) Jiao[1]
[1]*Nanyang Technological University, Singapore*
[2]*Tianjin University, China*

Affective product design, which focuses on customers' affective responses and aspirations, is arousing attention increasingly. This paper draws on ordinal logistic regression to deal with affective product design, mapping from designer domain to customer domain. It takes a de-signer's perspective and facilitates the handling of affective information and assists the designers to make trade-off deci-sions. Specifically, ten generic affective dimensions of truck cab design were identified. Ordinal logistic regression and weighted ordinal logistic regression were applied to discover the quantitative relations between design elements and cus-tomer affective needs. A case study of Volvo truck cab de-sign was also reported.

Management of Working Shifts Using The Constraint Programming Paradigm
David de la Fuente[1], Jesus Lozano[1]
[1]*University of Oviedo, Spain*

After an introduction to constraint programming and the man power job shifting problem, we applied the constraint programming paradigm in the development of C code to make year wide calendars for a given prerequisites. We present a diagram of the program which shows a very efficient way to solve the problem. The resulting multi-shift calendars were well balanced between shifts and were produced in short computational time.

Session	Intelligent Systems
Date	12/11/2008
Time	09:00 - 10:30
Room	Venus 3
Chairs	Carman Ka Man Lee, Iraj Mahdavi

Ensemble ANN-Based Recognizers to Improve Classification of X-bar Control Chart Patterns
Adnan Hassan[1]
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Many of the previous research on the control chart pattern recognition were related to fully developed patterns. However, in practice, the process data will appear as a continuous stream of partially developed patterns. Such developing patterns are difficult to recognize since their structure are normally vague and dynamic. This study investigated the merit of a generalized single recognizer (allclass-one-network (ACON), a committee of specialized recognizers (one-class-one network, OCON) and the ensemble of ACON and OCON recognizers. These recognizers were embedded into a monitoring framework to enable on-line recognition. The performance of the schemes was evaluated based on percentage correct classification. The findings suggest that the ensemble of ACON and OCON recognizers with simple summation could significantly improve its discrimination capability. It is concluded that the strategy to configure and consolidate multiple recognizers is very important to achieve good classification performance.

Prior Training with Jittered Series for Time Series Forecasting
Tung-Chen Huang[1]
[1]*Leader University, Taiwan*

The improvement of forecasting accuracy is always an important and difficult task in many areas. In this study, we propose a method of constructing the jittered series to improve neural network forecasting performance for a short time series. My experiment shows that jittered series has a significant impact on forecasting performance of a neural network especially in a short time series. The noise level of time series has no significant impact on the size of jittered series. The larger the size of training sample is, the less impact of a jittered series will be. The results of the linear simulated data show different from those of the nonlinear simulated data in forecasting performance while training with jittered series. The smaller size of the training sample can improve the forecasting performance 30% higher for the linear simulated data and 50% to 60% higher for the nonlinear simulated data.

Using RFID Technology on Clinic's Pharmacy Operation Management and Development of Intelligent Medicine Dispensing Cabinet
Shien Chii Shieh[1], Chang-Ching Lin[2], TaiFu Yang[1], Gu-Han Tu[1]
[1]*Tung Nan University, Taiwan*
[2]*St. John's University, Taiwan*

We rely on pharmacist professional service for a long time. This research emphasizes on how to improve Taiwan's present clinic pharmacy dispensing system by introducing RFID technique to assist small clinic which hires single pharmacist that can't perform repetitive inspections. Human factor and new processes are took into consideration to enhance the dispensing accuracy. By installing real system and reestablishing the dispensing process, our primary goal is to ensure the medication safety and to reduce the medicine risk. Our efforts include prescription electrolyzed at the front end, light-indicator-aided picking system to help the pharmacist taking the exact medicine during dispensing, RFID embedded cabinet to perform the double check procedure, electrical weighting scale to make sure the right amount and CCD camera to reconstruct the scene when errors do happen.

Product and Process Configuration : A Constraint Based Approach
Michel Aldanondo[1], Elise Vareilles[1], Meriem Djefel[2], Claude Baron[3]
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[3]*University of Toulouse - LATTIS - INSA, France*

This communication deals with the possibility of coupling together interactive product configuration tools with process planning tools in order to communicate and make consistent decisions made from one side to the other side. The first section introduces the problem and the general ideas of the proposed solution. Then, two constraints based models, respectively relevant to product configuration and process planning, are presented. Finally first investigations for coupling these two models and associated problems are discussed. An example illustrates our proposal through out the paper.

Control of Robotic Manipulators Via Supervision of the Free Design Parameters and Sampling Rate
Manuel de la Sen[1], A. Almansa[1], J. C. Soto[1]
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An adaptive control scheme for mechanical manipulators is proposed. The control loop consists of a network for learning the robot's inverse dynamics and on-line generating the control signal. Some simulation results are provided to evaluate the design. A supervisor is used to improve the performances of the system during the adaptation transients. The supervisor exerts two actions. The first one consists of updating the free-design adaptive controller parameters so that the value of a quadratic loss function is maintained sufficiently small. The second action consists of an on-line adjustment of the sampling period within an interval centered at its nominal value.

Reverse Engineering: a Methodology for Supporting Smart Free - Form Digitalization
Enrico Vezzetti[1], Antonio Zompì[1]
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Reverse Engineering is a technology that generates a virtual representation of an existing part based on point data acquisition with measuring techniques. Different technologies could be employed to obtain a virtual representation of a physical model, but the use of a solution (3D scanner) rather than another, could provide significant different results because the available 3D scanners are characterised by different performances (resolution, accuracy, …). The selection of the right 3D scanner could guarantee an improvement in the points acquisition precision, but it could not assure an efficient points distribution in term of number and locations. These two parameters make part of the acquisition strategy, that should provide a consistent sampling plan. For this reason this paper wants to propose a methodology to define a selectively sampling plan, with grid dimensions related with the complexity of the local surface region analyzed.

Session	Quality Control and Management 3
Date	12/11/2008
Time	11:00 - 12:30
Room	Venus 3
Chairs	Lianjie Shu, Wanbo Lu

Study on Weight of the Assessment Criteria for Thailand Quality Award

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This research aims at studying on the weight of assessment criteria for Thailand Quality Award (TQA). This study was conducted to examine whether the full score related to other opinions or not by using Analytic Hierarchy Process (AHP) as a tool to find out the weight of each sector. It was found that the weight received by the interview was different from the assessment criteria, which was so evident in 2 sectors: business results sector and human resource focus sector. If the business result sector was deleted out, the human resource focus sector contained more weight received by the interview than the criteria for TQA. In the practitioners' viewpoints, the most important sectors were the organization leading sector and human resource focus sector. Therefore, steering an organization towards best practice needs a focus on creation of one with strong leadership and competent knowledge personnel for its best business performance.

Bayesian Sequential Estimation and Evaluation of Process Capability Indices with Multiple Subsamples

Huiming Zhu[1], Keming Yu[2]
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[2]*Brunel University, United Kingdom*

Process capability analysis is designed to estimate the proportion of parts that do not meet engineering requirements in a stable production process. Using process capability indices to quantify manufacturing process precision and performance is essential part of implementing any quality improvement program. In this paper, we proposed a Bayesian sequential approach to estimate and evaluate the process capability based on multiple subsamples. Its advantage is that the parameters' posterior distribution in the current states is considered to be their prior distribution in the next state, thus reducing the variance of the estimators through the use of the information about the past production manufacturing process. According to the parameters' sequential posteriors, we establish the point estimation and the one-sided confidence interval for the process capability. Finally, we give an example to illustrate application of the proposed approach.

Statistical Monitoring of Multivariate Linear Profiles

Abbas Saghaei[1], Rassoul Noorossana[2], Majid Eyvazian[2], Abolfazl Vaghefi[2]
[1]*Islamic Azad University, Science and Research Branch, Iran*
[2]*Iran University of Science and Technology, Iran*

In some quality control applications, quality of a product or process can be represented by a relationship between two or more variables. This relationship is referred to as profile. However, in other practical applications, two or more profiles are required in order to model the quality of a product or process effectively. In this paper, we propose the use of a control chart scheme in phase II monitoring of multivariate linear profiles. The statistical performance of the proposed method is evaluated using a numerical example. The results reveal that the proposed method is relatively effective in detecting shifts in the process parameters.

Applying Six Sigma Techniques in Plastic Injection Molding Industry

Tarek Safwat[1], Aziz Ezzat[2]
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[2]*Arab Academy for Science and Technology, Egypt*

This paper presents an approach to implement a six sigma technique to decrease the scrap rate in a plastic injection molding plant. Using a case study of NATPACK Co. a plastic packaging company in Al Obour City, Cairo, Egypt. A Six sigma DMAIC methodology was applied to structure the study and scope the project. DMAIC which stands for Define, Measure, Analyze, Improve, Control is widely used in many six sigma projects since the 1990s. The proper tools that are suitable for injection molding industry needs were investigated. The primary tools used are SIPOC, MSA, FMEA, P-Control Charts, Hypothesis Testing. In this case study we compare the average scrap rate for the "Before" study period with the average scrap rate of the "After" study period.

On Evaluating the Measurement Capability of High-quality Processes

JrJung Lyu[1], MingNan Chen[1]
[1]*National Cheng Kung University, Taiwan*

Measurement systems analysis (MSA) ensures that the required data can reliably perform quality improvement initiatives. The common program to assess the precision of a measurement system is the gauge repeatability and reproducibility(R&R) study. Few investigations relate to the gauge R&R study for attribute data despite a need for industrial applications. Industries with near zero-defect manufacturing environments often experience occasional nonconformities in some samples when random shocks arise. The standard MSA may fail to identify defective data from high-quality processes. This study proposes an attribute gauge system to enhance the capability of the measurement system. The process and potential of the proposed system is illustrated using a manufacturing case.

Regression-Based Limits for Multivariate Poisson Control Chart

Tsen-I Kuo[1], Jing-Er Chiu[2]
[1]*National Kinmen Institute of Technology, Taiwan*
[2]*National Yunlin University of Science and Technology, Taiwan*

C-charts and U-charts are widely applied for Poisson distribution to monitor the number of defects in the univariate process. More than one quality characteristic for attribute data with Poisson distribu-tion is of interest in many industrial applications. A control chart is constructed for monitoring multivari-ate Poisson count data, called the MP chart. The MP chart is constructed based on the sum of defects or nonconformities in one single control chart. In this study, the control limits in the multivariate Poisson process are estimated by using multiple linear regres-sion model since the calculation of control limits is complicated. Two examples are provided to illustrate the effectiveness of this approach.

Session	Poster Session 3
Date	12/11/2008
Time	10:30 - 11:00
Room	Venus 1

Thermal Error Analysis and Error Prediction Modeling on a Machine Tool
Rui Zhu[1], Shijie Dai[1], Yonglu Zhu[1], Xinye Wu[1], Yinbiao Guo[1]
[1]*Xiamen University, China*

Thermal errors are the largest contributor to the dimensional errors of a workpiece in precision machining. It is very significant to study how to accurately simulate the spindle thermal errors. In this paper a novel concept of thermal error modes analysis is proposed to develop a better understanding of the thermal deformation on a machine tool. The basic thermal error modes for a structural element are the thermal expansion and bending mode. The selection of sensors location can be improved based on the thermal error modes analysis with finite elements analysis for reference. Through variables grouping and optimization approach, key temperature variables are identified, the number of thermal sensors has been reduced from 16 to 3. The thermal error prediction modeling based on the proposed method has been applied to a machine for verification, and the results show the thermal error prediction model is satisfying for thermal error compensation.

Hybrid Management in a Hierarchy Organization
Mani Tousi[1], Esmaeil Mesgarpourtousi[2]
[1]*McGill University, Canada*
[2]*Tehran-Boston Engieers, Iran*

In this paper, the problem of management in an organization with a hierarchical structure is modeled as a hybrid multi-layer switching control problem. A novel approach is proposed to transfer a management problem to a control system problem. The supervisory control of a Discrete-Event System (DES) is used for decision making in the organization. This method takes advantage of the hierarchical structure of an organization to find the optimal solution in terms of achieving the desired scopes of the project while minimizing the resources (time and cost). Although the problem formulation is explained for a hierarchical organization, the method is general enough to be applied to any team collaboration problem including the flat structure organizations. In fact, this methodology improves the monitoring and controlling phase of the project management.

Research on Constructing the Framework of Urban Emergency Response System Based on Multi-Agent System
Xia Wang[1], Chunjing Ge[1], Xianjun Guan[1]
[1]*Tongji University, China*

With the accelerating process of urbanization, the frequency and damage of urban disasters become more serious. Urban emergency response system is essential to secure people's lives and properties safety. The framework of urban emergency response system is constructed based on Multi-Agent System in this paper, and these agent groups of the system are analyzed. This paper provides a model of the system in urban disasters in different stages of its operation. The system is expected to solve those complex problems in urban disaster management and integrate organizations, information and resources into cities.

A Coordination-Theory Driven Approach for Manufacturing Web Services Composition Process
Meng Qian[1], Zhong Liu[1], Li Yao[1], Weiming Zhang[1]
[1]*National University of Defense Technology, China*

Modern manufacturing enterprises often need collaborations in their business processes. When coalition services must work together, the coordination problems may be very complex. Coordination theory provides a method for modeling complex collaborative activities in a distinct way. Hence, a methodology with its visualization approach of modeling Web Service composition coordination process was proposed. According to the methodology, models all about the Web Services composition collaboration processes in an e-manufacturing process were set up as a practical example. This approach will help to make different Web Services more adaptable to Web Service oriented application.

Optimization of Emergency Logistics Delivery Model Based on Anti-bioterrorism
Yudong Ke[1], Lindu Zhao[1]
[1]*Southeast University, China*

In the anti-bioterrorism system, the emergency logistics distribution is an important component, which is the foundation and precondition of safeguarding carrying out rescue activities. The background of emergency logistics in the anti-bioterrorism system is analyzed in this paper. Aiming at the problem of emergency materials under the system of anti-bioterrorism, satisfying the emergency time is taken as the premise, and minimizing dispatches cost is taken as the goal, the paper proposes the solution frame under the related constraints; meanwhile, it establishes the corresponding mathematics optimization model. Also the solution algorithm and the corresponding simulation example are given. Thus, the emergency effectiveness and the economic efficiency have achieved the organic unification.

The Study of Factors Impacting on Organizational Innovation in Financial Holding Company
Chih-Chung Chen[1], Yung-Her Yang[1], Shi-Ting Hsiung[1]
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"Innovation counts very much" has been discussed more that thirty years. Most scholars consider innovation one of the cores in modern management and strategy. Recently, there have been many empirical studies on organizational innovation from viewpoint of organizational culture. And some studies focus on that from organizational structure. This study will discuss over the relationships among organizational culture, structure, learning, and innovation. The samples in the study come from fourteen financial holding companies in Taiwan. The findings are presented in the study. Organizational culture has significantly positive impact on organizational learning and innovation. Organizational learning has significantly positive influence on organizational innovation.

Co-creation Value with Customers and Firm's Capabilities
Xiang Zhang[1], Guoxin Wang[1], JingChang Shangguan[1], Yanqiu Xiao[1]
[1]*Beijing Institute of Technology, China*

Value co-creation with customers is a new source to gain competitive advantage. However, the research in this area is still in its early stage. The link between co-creation activities and firm's capabilities is not clear. By using multi-industry sample, this study empirically demonstrates that firms may benefit from value co-creation with customer by not only gaining new capability but also enhancing traditional capabilities.

Knowledge Sharing Behavior, Antecedent and its Influence Towards the Company's Innovation Capability
Hilmi Aulawi[1], Iman Sudirman[1], Kadarsah Suryadi[1], Rajesri Govindaraju[1]
[1]*Bandung Institute of Technology, Indonesia*

This research develops conceptual model to elaborate the relationships between knowledge infrastructure, knowledge sharing behavior and innovation capability. This research presents more profound insights on which knowledge infrastructure regarded crucial in supporting knowledge sharing behavior. Besides it, explaining how knowledge sharing influences towards company's innovation capability. The result of this research is expected to leverage learning ability towards the development of knowledge sharing behavior within organization. Moreover this research is also expected to provide referential framework to researchers and practitioners on the components of knowledge infrastructure needed to be developed in order to build effective knowledge sharing behavior in an organization. Our research has identified several dimensions of knowledge infrastructure which are considered supporting knowledge sharing behavior: organizational culture, managerial, organizational structure, people, and information technology. This research is based on theory reasoned action to explain how knowledge infrastructure is able to form knowledge sharing behavior.

Factors and Variables Affecting the Adoption and Practice of Knowledge Management: an Exploratory Study in the Life Insurance Companies in Taiwan

Ching-huai Peng[1]
[1]*China University of Technology, Taiwan Central University, Taiwan*

Knowledge management (KM) is crucial for organizations to enhance their competitive advantages. While KM has been used and operated in the business world for decades, its applications, which involve recognition of knowledge, development of information system and support of organization, have just been initiated in Taiwan life insurance industry recently. Accordingly, KM can be seen as an innovation for the life insurance companies in Taiwan. This paper attempts to investigate the factors and variables in the context of life insurance companies in Taiwan. An exploratory study is undertaken by conducting interviews with ten participants, who represent different positions in six life insurance companies which vary in backgrounds and stages of KM applications. Content analysis is used to identify the factors and variables and a comprehensive model of KM adoption and practice is thus developed. This study provides managerial implications particularly for those life insurance companies embarking on KM in Taiwan.

How an Incubating Network Works? Review and Evidence

Dechang Lin[1], Zhuoxin Li[1], Hong Yin[1], Qiang Lu[1], Hongwei Wang[2]
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Networking is one of the most important services provided by incubators which has significant impact on the performance of incubated firms. This case study inquires the complex and dynamic process of the formation, development, operation, and effect of such a networking service. Three kinds of actors – incubated firms, incubator and the third-party stakeholders, are involved in the network. The interaction and cooperation among the actors, the intensity and range of networking influence the performance of incubated firms from the aspects of resources acquisitions, relationship-building and entrepreneurship-nurturing. Some facts collected from a business incubator located in Shenzhen, China, provide supporting evidence.

Tie Strengths of Interfirm Network, Market Uncertainty, and Innovation: A Case Study

Xinmin Peng[1], Guoqing Yan[2], Yuan Sun[3], Haibo Zhang[2]
[1]*Zhejiang University, Zhejiang Wanli Universiy, China*
[2]*Zhejiang Wanli University, China*
[3]*Zhejiang University, China*

This paper rather focuses on analyzing the impact of different network tie strengths on exploratory and exploitative innovation success. The case of Haitian Group is employed to explore and explain the relative propositions. Our key claim is that the benefits of each type of firm tie not only vary across each other but will be moderated by market uncertainty such that certain types of ties will matter more or less under certain conditions. Specially, Strong ties are valuable in environments that require exploitation, while weak ties would be more appropriate for exploration. From the firm as a whole, exploration and exploitation are two essential innovative models, under which firms need make a reasonable choice between them according the development stage, market environment and innovative targets, and maintain the number of strong or weak ties at a reasonable proportion.

Pleiotrophy Analysis of a Technology System: An Empirical Case of iPod

Sanna Puha[1], Saku Makinen[1]
[1]*Tampere University of Technology, Finland*

Apple Inc's product iPod has become the most popular music player in the markets. There are significant numbers of the products sold and competitors are trying to imitate Apple's successful product. As these are characteristics of dominant designs in the market we are applying one recent framework by Murmann and Frenken for analysis of technology system taking one iPod model as a case example. This model seeks to find the core and peripheral components of technology systems and in this way analyze the possible effects of component changes from the user perspective of perceived services.

Periodic Preventive Maintenance Policy for Finite Horizon with an Adaptive Failure Law

Jeremie Schutz[1], Nidhal Rezg[1], J. B. Léger[2]
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[2]*President of PREDICT, France*

Several periodic preventive maintenance (PM) models have been developed in the literature. This paper introduces an adaptive failure law which can vary over time depending on the missions to achieve. From this degradation law, the purpose of this paper is to develop a preventive maintenance policy for finite horizon of time, noted H, based on a set of improvement maintenance actions at fixed interval with renewal at time H. The problem is to determine the number of PM actions which must be performed using cost criteria. Moreover, the cost and the preventive maintenance duration depend on a coefficient of quality. Numerical example is presented to illustrate this policy.

On the Supervisory Control of Marked Graphs

Zied Achour[1], Alexandre Sava[1], Nidhal Rezg[2]
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This paper presents a control synthesis approach for discrete event systems modeled by marked graphs with uncontrollable and / or unobservable transitions. It solves forbidden state problems characterized by a set of General Mutual Exclusion Constraints. We show that there exist a unique marking from which all other possible current markings can be reached uncontrollably by firing sequences of uncontrollable transitions. This feature allows us to design efficient control policies based on proper separation of observation and control. Taking into account time information allows generating more permissive controllers by knowing which is at a certain time the number of token in a place.

Optimal Policy for a Manufacturing System Subjected to Random Failure and Calling Upon Several Subcontractors

Sofiene Dellagi[1], Nidhal Rezg[2], Ali Gharbi[3]
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[2]*University of Paul Verlaine, France*
[3]*ETS, Canada*

In this paper, we have developed an integrated maintenance policy for a manufacturing system subjected to a random failure and calling up on several subcontractor machines. The problem consists on a machine, unable to satisfy a constant demand. That's why it called upon another machine, comprising the so-called subcontractor machine, which produces at a certain rate the same type of product. In order to assure an economical objective, we have a choice between several subcontractors having some different data. In this paper we have proved analytically, that the choice of the subcontractor machine is conditioned by the unit lost cost due an unsatisfied demand of one product. A numerical example confirms the analytical results.

Economic Design of Acceptance Control Charts

Fatemeh Mohammadian[1], Kamran Paynabar[2]
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Acceptance control charts are one of the effective tools for monitoring capable processes, where the fraction of produced non-conforming items is very low. Due to high capability of the process, in these charts, controlled changes in the process mean are allowed. Although acceptance control charts are widely used in practice, it is often designed without considering the economic aspects that would result in economic drawbacks from the process and cause in increasing process costs. In this paper to make the acceptance control charts more applicable, an economic model is presented. In this model, control chart parameters, sample size, sampling interval, and the control limits coefficient are determined such that the expected cost of the process is minimized.

Supporting Decision-making for Secure Resource Sharing between Coworkers Using an Affective-based Trust Evaluation Model

Tsung-Yi Chen[1]
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Trust is a particularly crucial issue for virtual project team (VPT) success because numerous project tasks are interdependent, making team members reliant on the functional expertise of their partners. The challenge to develop trust is particularly complex because trust should consider various factors into different assessments made during different VPT phases (early, middle and late project phases). This study aims to propose an affective-based trust evaluation model that is applied at the late project phase. The trust value evaluated by the affective-based sub-model is determined based on coworker emotions. Therefore, using the model during late project phase can assist VPT workers in making more accurate decisions regarding secure resource sharing with other coworkers.

Optimal Construction Sequencing for Secant Pile Wall

Jieh-Haur Chen[1], Li-Ren Yang[2], Mu-Chun Su[1], Jia-Zheng Lin[1]
[1]*National Central University, Taiwan*
[2]*Tamkang University, Taiwan*

Finding the optimal sequence so as to minimizing the construction time is one of the solutions to lower the construction costs. This study proposes an effective and efficient optimization algorithm, Self-Organizing feather Map based optimization (SOMO), to minimize the construction time with an application to a case study in obtaining the optimal sequences for both primary and secondary bored piles of a secant pile wall. The SOMO is a new developed algorithm according to the human brain that is capable of producing topologically ordered mapping, and that can occur in the evolution of the feature map for optimization. The results demonstrate that the optimal sequences for both primary and secondary bored piles are determined with 27.21% of time saving. The practicability of the SOMO algorithm is substantiated.

Risk Based Maintenance Decision on Power Station High Press Feed Water System

Yuliang Dong[1], Yujiong Gu[1], Kunliang Chen[1]
[1]*North China Electric Power University, China*

As an important part of power plant, high press feed water system is responsible for providing water for boiler incessantly. In traditional maintenance strategy, replacement or inspection time is determined just according to overhaul or minimal maintenance standard items, the result is either maintenance cost increasing due to excessive maintenance or reliability decreasing due to deficient maintenance. For the problem, a frame of risk-based maintenance (RBM) decision is put forward, the expression method of failure effect and risk is determined, and the optimal maintenance interval of equipment in system is decided by using fault tree algorithm. Take the high press feed water system of a certain 300MW unit as example, the maintenance decision is made. It is shown by the instance that this method is feasible and effective, and the decision result can be used as a support for maintenance plan.

Application of the Fuzzy Comprehensive Evaluation Method Based on Entropy Weight and AHP in Maintenance Mode Decision of the Power Plant equipment

Kun-liang Chen[1], Yu-jiong Gu[1], Kun Yang[1]
[1]*North China Electric Power University, China*

Aiming at the difficulty in selecting the maintenance mode of the power plant equipment with ration, the fuzzy comprehensive evaluation method based on entropy weight and analytic hierarchy process (AHP) is suggested in this paper. It combines entropy weight method with AHP method for against the casualness and subjectivity of the weight in traditional fuzzy comprehensive evaluation method. With the method, the maintenance mode is divided into some layers composed of index factors, and the subjective and the objective weights can be calculated to fit the comprehensive weights based up on the corresponding judgment matrix and fuzzy evaluation matrix. And then with the principle of fuzzy comprehensive evaluation, the maintenance mode can be finally decided by the comprehensive weight and judgment matrix. The calculating result of applying the proposed method to the example demonstrates that the method is valid and feasible, and it is capable of evaluating the maintain mode of the power plant equipment for supplying the gist for the condition maintenance decision.

Study on Evaluation System for Economic Effectiveness of Safety Resources Based on Data of Accounting

Enzhu Li[1], Xueyi Zhu[2]
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This paper demonstrates the necessity of establishing the evaluation system for safety resources based on data of accounting systematically. The author gives the connotations and the features of the proposed new evaluation system of the safety resources. The main viewpoint of the paper includes that evaluation system for safety resources is used in all units with possible accidents in production and for estimating and reflecting the effectiveness of the resources provided in preventing accidents, and also for the compensation of the losses caused by the accidents in production within the entire process. On the basis of the connotations of this evaluation system, the main framework and the model of Data Envelopment Analysis（DEA）for the new evaluation system is also explained. The purpose of establishing this evaluation system is to promote effective management and evaluation of safety resources invested in high dangerous industries and enterprises.

Economics Analysis on Relations of Safety Cost and International Trade Competition Ability

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This thesis analyzes the actual influences to the Harmonization of Safety and Health Standards (HSHS) and Labor Standard on the international trade, and discusses the relations between the safety protect cost and international trade competition ability by applying the basic theories of economics. It is concluded that the influence of safety protect cost of small countries in international trade on their international trade competition ability is great, but the influence of safety protect cost of big countries on their international trade competition ability is minor, big countries are more positive to increase safety invest. Finally, it is suggested that the developing countries should oppose the impractical exaltation of labor standards, and that Chinese export enterprises should adapt to the trend of green safety production in target market and realize intrinsic safety in work safety.

Study on Multi-agent Based Maintenance Decision Support System Used for Power Plant Equipment

Yu-jiong Gu[1], Xiao-feng Dong[1], Jian-jun Wu[1], Kun Yang[1]
[1]*North China Electric Power University, China*

With the developing of industry, maintenance has become an important factor that influences survival and development of the business. There are numerous pieces of equipment in a power plant, but the maintenance requirement is different for respective equipment, so making condition based maintenance in a power plant is a systemic and integrative activity in maintenance management. As an interdisciplinary activity, a special maintenance decision support system is necessary to aid operating and maintenance personnel use that knowledge right and well. As a hotspot of Distributed Artificial Intelligence research, agent technology is one of the strongest tools for constituting large-scale distributed and open computer-based systems. This paper briefly introduces decision support system and agent technology, and presents an architecture of multi-agent based maintenance decision support system used for power plant equipment, and describes its architecture, function and decision making process in detail.

Testability Demonstration Method of Electronic Equipment Based on Hypergeometric Distribution

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Fault detection rate (FDR) and fault isolation rate (FIR) were used for electronic equipment testability demonstration usually, but they were not fit for the current electronic test equipment characteristic. So the demonstration indexes, Fault detection coverage (FDC) and fault isolation coverage (FIC) were put forward in this paper. Hypergeometric distribution was instead of Binomial distribution to show detecting success ratio. Then maximum likelihood estimate was application in point estimation. Bayes' formula was used for interval estimation. And testability demonstration rule was put forward. At last, an example was given to approve the validity and practicability of the new method.

Optimization of Bridge Elements Maintenance Strategy

Ying-Hua Huang[1], Hsun-Yi Huang[1]
[1]*National Yunlin University of Science and Technology, Taiwan*

For existing bridges, maintenance activities are important for bridge safety and management. However, the implements of maintenance activities cause traffic jams, detours, and thus tremendous user costs. In order to reduce user costs resulted from maintenance activities as well as to maintain bridge elements in good statuses, this paper proposes a concept of bridge elements concurrent maintenance. The concept of concurrent maintenance attempts to integrate maintenance timing of different elements of a bridge in order to reduce user costs from the life-cycle cost point of view. Constraint programming is conducted to find the optimal maintenance strategy. The results showed that the proposed model reduces effectively the total user cost and the total life cycle cost of bridge maintenance within the analysis period.

An Empirical Study on Inexperienced Online Consumer's Window Shopping Behavior: a Trust-cost-behavior Model

Fue Zeng[1], Hua Zhang[2]
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[2]*City University of Hong Kong, Hong Kong*

This paper estimated a model of inexperienced consumers' window shopping behavior in China context. An empirical study was conducted in China to test the model. The results indicate that many Chinese inexperienced consumers only do window shopping, at least partly, because they perceived high transaction cost during e-shopping which induce them to stop more involving. Moreover, we found that trust propensity tends to decrease consumers' perception of transaction cost but dependability and private policy tend to enlarge their tolerance of transaction costs and induce them invest more cost. That means if consumers develop more and more trust during this e-shopping, they would be more likely to investing more costs in e-shopping.

Formal Semantics for Component Assembly Pattern of Software Architecture

Wei Guo[1], Sheng Xu[1], Renzuo Xu[1]
[1]*Wuhan University, China*

The performance and reliability of component-based software architectures rely fundamentally on the quality of the components and the configuration that the system is composed. This paper analysis the assembly patterns and interaction behaviors of components at first, then an ontology of the component's operation is proposed, which the interactions of components are formalized and abstracted. Based on the in-depth analysis of the component assembly patterns, this paper try to define the assembly patterns in architecture on process algebra theory, which can establish a practical means of describing and analyzing the component assembly pattern in the software architectures. Furthermore, the architecture algebra model has been built, which can set a theoretical foundation for the further research on analysis and validation of architecture.

Research of Time-of-Use Electricity Pricing Models in China: A Survey

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In this paper, we make a survey on the research of time-of-use (TOU) electricity price and TOU pricing models and methods in China. We summarize the basic idea, hypothesis and the general model of the following pricing models: (1) TOU pricing model based on user response, (2) pricing model based on the user response and customer satisfaction, (3) pricing model based on the linkage between the generation side and the demand side, and (4) TOU pricing based on game theory. Then we make comparisons and reviews on these models and methods, analyze their advantages as well as the existed deficiencies, and put forward the research prospect of the TOU pricing model.

Value Estimation for Software Product Management

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Value-based approach of software engineering proved to be one of the most important branches of software engineering because it elicits and reconciles stakeholder's value propositions with respect to the system into a mutually satisfactory set of objectives for the system. Thus most of software organizations in market-driven environment nowadays adopt value-based approach with the focus on maximizing the value gained from their products against consumed resources. This leads to a need for a value estimation methodology to incorporate all the software product value aspects altogether while measuring the product value. Most of the existing methodologies focus on measuring the product financial value and neglect the non-financial value. This measurement will facilitate quantifying the total value obtained from the product and compare it against planned product budget at early phases of the product life cycle. Such comparison will be used as a sort of justification for the product feasibility. This paper illustrates a new estimation methodology for the software product value called "Value Point". VP measures the value gained from the software product through quantifying value obtained from each product requirement. The process for value point counting will be illustrated through a designed product management framework. A case study is performed to demonstrate the added value from the proposed estimation methodology

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Services

Post Conference Visits *(Requires Advance Booking & Payment)*

Please Present Ticket To Coach Driver

- Visit to Nanyang Technological University (NTU) and Forum "IEEM: State and Future"
  Thu – 11 Dec 2.30pm to 5.30pm at Lecture Theatre / Multipurpose Room, NTU
  Coach departs Furama Hotel 1.30pm and returns by 6.30pm

- Visit to National University of Singapore (NUS) and Symposium "Service Science, Management and Engineering (SSME)"
  Thu – 11 Dec 2pm to 5.30pm at University Hall, NUS
  Coach departs Furama Hotel 1.15pm and returns by 6.15pm

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Outside VIP Room – Level 3

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Silver Cab: 6363 6888
Yellow-Top Cab: 6552 2828
MRT Information Centre (NE & EW Lines): 1800 336 8900

About Singapore
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City Search: 1900 777 7777
Flight Information: 1800 542 4422
Time of Day: 1711
Weather: 6542 7788

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Citibank: 6225 5225
Diners Club: 6294 4222
Master Card: 6533 2888
Visa Card: 1800 345 1345

Services

Complimentary Shuttle Service
(Enquire at the Hotel Information Desk)

Take the hotel's complimentary shuttle bus service to Orchard Road, or navigate through the historical shop houses in Chinatown that are brimming with bargains and exquisite local fare.

Tiong Bahru Estate
Visit the local eateries that dot the shop houses surrounding the hotel or relish in the bustle of a typical wet market at the Tiong Bahru Estate. With its curious mix of art deco and local architecture, discover Singapore's first public housing estate build in the 1930's.

Today, Tiong Bahru has carved a name for itself amongst bona fide gourmets. Here, you can find everything from simple hawker fare to cafes dotting the road lanes around the estate.

Chinatown
Navigate through street bazaars tucked between historical shop houses brimming with irresistible bargains and intricate Chinese handicrafts. Lookout for hawkers at the Chinatown Food Street – handpicked by culinary experts to recreate the street stalls of yesteryear. Don't forget to visit the majestic Sri Mariamman Temple, Singapore's oldest Hindu temple along Chinatown's Temple Street.

Orchard Road
Take the complimentary shuttle bus to the shopping haven of Singapore for endless shopping. Meander through affordable designer-wear, high-end boutiques, novelty shops, chic gourmet restaurants and themed bars.

Clarke Quay
See the legacy of Singapore's history by cruising down the Singapore River in an authentic bumboat. The cruise passes godowns and old shop houses that have since metamorphosed into hip themed eateries, bars and premier nightclubs.

Services

What to do and Where to go in Singapore

(Own Time Own Target or Book A Tour at the Hotel Tour Desk)

Butterfly Park & Insect Kingdom
With more than 3,000 species of butterfly and insect specimens, it is one of the world's largest collections.
Open: 9am – 6.30pm daily (last entry 6pm).
Getting There: Take the Sentosa Bus from Habourfront Centre Interchange (just next to Harbourfront MRT station). On Sentosa, take the bus on the Blue or Green Line.

Jurong Bird Park
Fly, flap, flutter, float… With over 9,000 feathered friends from 600 species, Jurong Bird Park is one of Asia Pacific's most impressive bird parks.
Open: 9 am - 6 pm (daily).
Getting There: Take the MRT to Boon Lay Station (EW27), and then take SBS Transit bus 194 or 251.

Night Safari
As the sun sets, a different world comes to life. At the Night Safari, you can look a rhinoceros in the eye, hear the howls of a pack of striped hyenas or watch giraffes glide serenely across the plain in the still of the night.
Open: 6pm to midnight (daily), Last ticket sale: 11pm.
Getting There: Take the MRT to Choa Chu Kang Station (NS4), then board SMRT Bus 927 to the zoo. Or take the MRT to Ang Mo Kio Station (NS16), and then board SBS Transit bus 138. to view MRT route map.

Singapore Zoo
Tired of having the usual breakfast? Then feast with an orang utan, the Oriental small-clawed otter, or even the reticulated python!
Open: 8.30 am – 6.00 pm.
Getting There: Take the MRT to Choa Chu Kang Station (NS4), and then board SMRT Bus 927 which takes you all the way to the zoo. Or take the MRT to Ang Mo Kio Station (NS16), and then board SBS Transit bus 138.

Underwater World
Situated on Sentosa, Underwater World is a dream haven which showcases the awe-inspiring beauty of a whole different world beneath the seas.
Open: 9am-9pm (last admission at 8.30pm) Dolphin Lagoon: 10.30am-6.00pm (last admission at 5.30pm).
Getting There: To Underwater World Singapore (UWS), take the bus on the Blue, Red or Green Lines. To Dolphin Lagoon, take the bus on the Yellow or Red lines.

National Museum of Singapore
At 119 years old, the National Museum of Singapore is Singapore's biggest and oldest museum with the youngest and most innovative soul.
Open: Singapore History Gallery, 10am – 6pm Daily
Singapore Living Galleries, 10am - 9pm Daily
(Free admission from 6pm-9pm)
Getting There: The nearest MRT stations are Dhoby Ghaut (NS24) & City Hall (EW13/NS25). The Museum is a 10-minute walk from these stations.

Notes