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Indian Institute of Management,
Lucknow
RESEARCH PUBLICATIONS

BOOK


As a tribute to Late Professor M.C.Puri, our revered mentor and an icon in the subject of Combinatorial Optimization, we have attempted, in this volume, to bring together some of the contributions made by Professor Puri in the domain of Allocation Problems along his journey as one of the most inspired and efficient guardian of research. Within the short span of time at our disposal and with our limited knowledge it seemed an impossible task to cover all aspects of his work that include besides Allocation Problems and its variants, topics like Set Covering Problems, Integer Programming Problems, Fractional Programming Problems, Fixed Charge Problems, Min Max Problems and Extreme Point Quadratic Minimization Problems, to name a few. The complete list of publications of Professor Puri is available at web-site [http://www.mcpuri.com](http://www.mcpuri.com). This book would be of tremendous utility to researchers interested in the field of Transportation and Assignment Problems. The papers included span over a period of thirty years from 1976 to the present time and many new avenues of research open out of the literature included. For academicians, operations research practitioners, management specialists, industrial and business organizations, government transport departments, this volume would be a powerhouse of information and a rich source of algorithms that would be applicable not only in transport planning but in various other sectors.

PAPERS


Meat industry in India is highly unorganized and most of the production takes place in local slaughterhouses which are old, unhygienic and lack basic facilities. Emerging global market opportunities for Indian meat industry have significantly induced private investment in meat processing through state-of-art technology of integrated plants. These plants are successfully adding value not only by improving the quality of meat but also by utilizing each and every part of the carcass efficiently which otherwise is being wasted at local slaughterhouses. But the contribution of these organized meat processing units is meager and their products are largely meant for exports. Though India has huge livestock population, meat production in the country is considered as an adjunct and socially unacceptable activity for majority of the population. Vertical interactions between different components starting from input supply, animals rearing, slaughtering & processing and sales & distribution of final meat and meat products to consumers are highly missing in Indian meat indu-
try. In practice, most of these components act independently. This paper analyses the missing linkages between various components and potential opportunities of designing vertical coordination for Indian meat industry.

**Anand, Manoj** and **Singh, Karamjeet. 2006. Reinventing the Giant Corporation: The Case of Tata Steel - Diagnosis. Vikalpa 31(3): 138-142.**

Tata Steel is presently an EVA + steel company and has a vision to become a dominant player in the global steel industry by entering new markets and developing new enhanced applications of steel. Mr. B Muthuraman, Managing Director of Tata Steel, reviewed the strategic initiatives and performance of the company during the last 15 years in the post-liberalization and globalized Indian environment. During the period 1991-92 to 2004-05, Tata Steel faced many challenges in respect of quality, global cost competitiveness, capacity expansion and modernization, overstaffing, change management and transformation into customer-driven culture, and shift in focus from steel commodity business to Tata Steel brand products. Tata Steel responded proactively to these challenges by way of process innovation, continuous improvement in business processes, employee-friendly HR management practices, creating and spreading new performance-driven culture, and creating value for customers and shareholders. Muthuraman faced the following dilemmas to sustain this high level of growth and identify new value drivers:

- Can the company break out of global competition?
- Can it consistently be a winner in terms of EVA positive company?
- How can it create a blue ocean (Kim and Mauborgne, 2005) and achieve sustained high performance?
- What are the strategic options to achieve this and thereby sustain high performance?
- What are the analytical tools and frameworks that are essential for creating and capturing blue oceans? What are the different paths available before Tata Steel to create blue oceans? How should it build a robust business model to ensure that it makes a healthy profit on its blue ocean idea? What are the organizational hurdles to blue ocean strategy execution and how to break them?


Universal education for all children is firmly on the policy agenda with its adoption as one of the Millennium Development Goals, and as a fundamental right of every child. The sheer magnitude of this commitment and the quantum of investment required for this to happen calls for a public-private partnership of a high order. However, this is an uphill task and its successful fruition depends upon several factors. This paper explores some of the issues involved in this process in the context of primary and mid-school education.

The objective of this paper is to test the predictive power of financial risk factors currently being considered by the internal credit rating models of the Indian commercial banks in predicting default companies. Three forms of multiple discriminant models are applied and tested on a sample of 112 default and non default companies which are part of credit portfolio of five largest Indian commercial banks. The results reveal that the selected financial risk factors are capable of predicting default one year prior to default with around 68 percent accuracy. These results are also validated on two separate sets of holdout samples.


In India's developing economy, the rural population is vulnerable to a broad range of risks and crises that directly affect its livelihood. These risks directly affect the level and/or sources of income and productive assets of these households. The study aimed to identify the most common risks and crises that rural households face; ways and means of households' response to such crises and risks; and potential demand for micro-insurance in rural areas.

Although the study identifies variety of risks and crises, which are faced by rural households in Uttar Pradesh, death, sickness, agriculture and livestock related shocks are ranked high not only in terms of financial pressure experienced by the poor, but also in terms of their frequency of occurrence. The study argues that there is clear demand for providing the poor with insurance services to help them better manage risk both ex ante and ex post. The lessons of micro-credit products should be extended to insurance products also.


Influences of various factors on competitiveness of a large nationalized bank in India are analyzed using data collected from a questionnaire survey among ‘first line’ managers in the bank. Four components of competitiveness – quality efficiency and governance, economic efficiency, social responsibility, and performance stability – and overall competitiveness are regressed on number of business strategies – unleashing products and services, customer focused marketing approaches, organizational culture, human resource management practices, future oriented policies, and global expansion plans etc. The empirical findings indicate that all fours components of competitiveness are influenced by different sets of strategies. Introduction of innovative products and services is perceived to contribute significantly both towards quality efficiency and economic efficiency. Expansion policies of the bank significantly influence social responsibility and performance stability components of bank’s competitiveness.

A methodology is proposed to find the critical capacity of an arc of a feasible network wherein lower bounds on flows on the various arcs are non-negative integers.


In this paper a bilevel time minimizing assignment problem is studied in which the aim is to find an optimal partition of the set of n facilities into two mutually disjoint subsets L1 and L2 where, L1 contains m facilities called Level-I facilities and L2 contains the remaining (n-m) facilities termed as Level-II facilities. The partition is to be optimal in the sense that for this partition the sum of the completion times of the jobs assigned to Level-I and Level-II facilities is the least. It is assumed that all the jobs are to be done, each facility works only on one job, and on each job only one facility works. Further Level-II facilities start working simultaneously on their respective assigned jobs only after Level-I facilities, working in parallel, have finished their jobs. To obtain the global minimizer of the proposed problem, a polynomial time algorithm is presented which has been coded in C++ and an empirical analysis has been carried out with the help of randomly generated test problems.

CONFERENCE/SEMINAR PAPERS


In this paper, we are addressing the issue of selection of Intermodel terminals in a linear and mesh Rail-Road network. The objective is to select optimal locations for intermodal terminals and assess impact of train service capacities on these locations. We consider the demand across node pairs, revenues for different demands, terminal’s fixed cost, demand constraints and limitations on the terminal and train service capacity for making the decision. The experiments showed that the train capacity is almost directly proportional to the network operator’s profile if there exists sufficient demand between various O-D pairs on the network. The experiments also showed that we can find optimal capacity sharing between various commodities on different train services.
Kumar, Sushil. 2006. IE in e-Millennium: A Phoenixian Way. Paper presented in (as well as published in the conference proceedings of) the 48th National Convention of Indian Institution of Industrial Engineering, held at Nimhans Convention Centre, Bangalore, India, during September 29-30, 2006. (Dr. Sushil Kumar also chaired a Technical Session in the conference).

This paper elaborates the Industrial Engineering from a historical perspective and tries to examine the relevance of traditional IE and its importance in this fast changing times. The paper endeavours to seek solutions to the questions such as: are we at a cross-road to decide which way to choose for IE at the present? Or, can we postpone the decision and let the time decides the better way? By avoiding the question, one can only delay the decision, but inevitable would remain such, and therefore the early understanding of the problem is must in order to design a right and timely response. An effort is made here to visualize the changing pattern in the field of Industrial Engineering. This includes the curriculum changes over the time and the demand of the industries as well. This may lead to chalk out a way providing Industrial Engineering a transformation from 'specific' to 'general' status for the future. This would demand a debate, discussion, deliberation and introspection from the experts in the field of Industrial Engineering. Thus, the article highlights the need of a rebirth for Industrial Engineering and put forth the urge for its evolution.


This paper characterizes the uniqueness of long cycle products and addresses the problem of reducing their production cycle time taking example of shipbuilding. We review the manufacturing environment for these products and highlight due date based planning system originating from final erection schedule. We suggest spatial scheduling for better utilization of constrained spatial resources at final assembly shops. To ensure that these resources receive the constituent product at scheduled dates, we propose a product oriented workgroup structure. These workgroups also ensure acceptable quality of the constituent products and operate on a schedule such that inventory is minimized. Based on workgroups we propose a layout targeting optimal movement of material and work in progress. The net effect is reduction in cycle time and improvement in throughput.


Analytic Network Process (ANP) is one of the widely used Multi-Criteria Decision-Making (MCDM) tools. ANP has been developed as a generalized approach to Analytic Hierarchy Process (AHP), one of the most widely used MCDM. This extended methodology (ANP) has enabled the stakeholders to analyze the problem and to take a decision by considering
the systems viewpoint. This paper is an attempt to explain ANP and to demonstrate its applicability in multi-criteria decision-making, especially ranking. An easy-to-understand example of ranking of the newsmagazines is worked out in order to explain the use of ANP.

**WORKING PAPERS**


The paper is structured in two parts. First part deals with conceptual issues including definition, scope and measurement. Some theorist still question the validity of emotional intelligence as a useful construct while others are optimistic about the construct but question the treatment of the subject by rival theorists. Two major perspectives have emerged in EI. One suggests that EI is a type of ‘intelligence’ hence must fulfill the criteria for qualifying an intelligence test. This perspective is identified as Ability based perspective. The other perspective talks about non-cognitive or competency based EI, is known as mixed model of EI. EI measures also differ according to perspectives followed by researchers. In the second part the findings of a study initiated for developing and standardizing a measure of Emotional Intelligence (EI) has been presented. While writing the items, the study has followed Goleman’s (1998) Model of EI competencies. Five dimensions: Self Awareness, Self Regulation, Motivation, Social Awareness, and Social Skills have been incorporated. Self awareness consisted of items covering issues of identifying one’s own emotions and their impact on behaviour, accurate self assessment and self-confidence. Self Regulation covered the issues of impulse control, stress tolerance, adaptability, and creativity. Motivation dimension consisted of items on achievement drive, optimism, and initiative. Social Awareness incorporated items relating to interpersonal sensitivity, service orientation, customer orientation and political awareness. Social Skills included items relating to leadership, influence, communication skill, change catalyst, and team and collaboration. Data were collected from 263 managers belonging to various functional areas and representing a heterogeneous set of organizations. While constructing scales following decision were made:

1. only positive worded items will be included. 2. At least three psychologists agree that item on face value belongs to the dimension that it aims to measure 3. Standardized Alpha reliability should be at least .70. 4. The corrected item-to-total correlation should be at least .20. 5. Twelve items each will be selected to represent each of the five dimensions meeting the first four criteria. The scales so constructed were tested to examine the hypothesized positive relationship with three variables organizational commitment, emotional expression and quality of life. The five dimensions of EI : Self Awareness, Self Regulation, Motivation, Social Awareness, and Social Skills were positively correlated with organizational commitment, emotional expression, and quality of life, suggesting concurrent validity. Confirmatory Factor Analysis was used to examine whether the five factor holds good with the data. Results revealed that the proposed model has reasonable fit. Thus the measure can be used in research studies The paper also discussed the precautions while applying the results of the study.

This paper has examined the relationship of various EI dimensions with three outcome variables namely, organizational citizenship behaviour, personal effectiveness and quality of life. The study has followed Goleman’s (1998a) Model of EI competencies. Five dimensions: Self Awareness, Self Regulation, Motivation, Empathy, and Social Skills were incorporated in the EI scale. Self awareness consisted of items covering issues of identifying one’s own emotions and their impact on behaviour, accurate self assessment and self-confidence. Self Regulation covered the issues of impulse control, stress tolerance, adaptability, and creativity. Motivation dimension consisted of items on achievement drive, optimism, and initiative. Empathy incorporated items relating to interpersonal sensitivity, customer orientation and political awareness. Social Skills included items relating to leadership, influence, communication skill, change catalyst, and team and collaboration. Data were collected from 504 junior leaders belonging to Indian army while the participants had come for training in one of the Junior Leadership Academy located in North India. Questionnaire was translated into Hindi as most of the participants were Hindi speaking. The EI dimensions were hypothesized to be positively related with the three outcome variables namely: organizational citizenship, personal effectiveness and quality of life. EI scales showed acceptable levels of alpha reliability. The results showed that all the five dimensions of EI : Self Awareness, Self Regulation, Motivation, Empathy, and Social Skills were positively correlated with the three outcome variables suggesting that EI dimensions positively contribute to outcome variables. The five dimensions of EI were regressed on the three outcome variables to examine the strength of relationship with EI dimensions. Motivation appeared to be most robust predictor, as it remained a significant contributor in all the outcome variables. Theoretical and practice implications of the study were discussed and along with its limitations.


An important reform in the Indian corporate bond market had been introduction of poll based bond spreads for various credit ratings. These spreads are being widely used for pricing new credit instruments and for valuation of bond portfolios. This paper evaluates the credit risk characteristics of these spreads from the perspective of the structural models of corporate bond pricing. Our results indicate that the spreads are mostly determined by proxies for default probability and recovery rate. This supports the use of poll based spreads for pricing credit instruments in underdeveloped and illiquid corporate bond markets.

Although several m-Payment technology solutions were offered to the business-to-business (B2B) market by many firms, only a handful of them have met with any semblance of success. Most of the solutions survived only a few months, which indicates the need to explore the m-Payment technology adoption process in the B2B context. To fill this critical research gap, it has been decided to conduct an exploratory study in the B2B context for identifying the antecedents of B2B m-Payment technology adoption process. To meet this research objective, a case study methodology has been resorted to by the researcher by focusing on three international cases. The present working paper, which is an offshoot of such a study, is successful to the extent of bringing forth a state-of-the-art literature review and directions for future research in the emerging domain of B2B m-Payment technology adoption.

**CASE**


This case study has identified and described the contribution of Network of Entrepreneurship and Economic Development (NEED) in promoting micro-enterprises and self help groups. NEED has been set up with the mission to create an impact upon the rights of deprived citizens by enabling women and children, to maximize their human resource potential and change their lives with significant emphasis on their livelihood and positive change in socio-economic, political, environmental and cultural spheres of life. While pursuing its mission NEED’s major concerns are: Women’s self help groups and mainstreaming of gender issues; Micro credit with multiplier effects; Micro-enterprise; Fair trade campaign from village to global levels with entrepreneurial skills; Child centered development approach; Health, education, agricultural diversification, income generation activities; and Capacity building and networking towards grassroots action. NEED has developed a model of women’s empowerment through SHGs that includes awareness training, skill development, exposure visits, and sound financial management for sustainability. For micro-enterprise development NEED has conceptualized a comprehensive gender sensitive model called Entrepreneurship linked Income Generation for Self-Employment Programme (EIGSEP). This training model consisted of six modules namely, motivation training, project guidance module, training in management issues, operations and production issues, escort phase consisting of practical issues in an enterprise formation, and follow up stage. The case study also records an evaluation of EIGSEP model. The study has thrown some 21 outcome indicators of women empowerment. The case study has also compiled feedback of Volunteers who have observed NEED’s functioning while promoting SHGs. Based on his vast experience the facilitator has identified features of successful micro enterprises and has suggested ways and means to replicate successful experiences of micro-enter-
prises development in other areas. The case study has also described small case experiences of three SHGs and struggles and achievements of their members. These are stories of crisis and fighting hostile circumstances and coming out victorious. Women described in these case studies are truly empowered who have learned craft and developed skills in the Groups promoted by NEED and have used these skills for starting their business. Finally, the case records the familiar voices of SHG members as to what has changed// happened after they have joined SHGs.

**EDITORIAL ASSIGNMENTS**

**Prof. Saji K.B.** served on the editorial review board of the conference proceedings of Product Development & Management Association (PDMA) Research Forum, held at Atlanta, GA, USA, during October 21-22, 2006. **Prof. Saji** worked with Prof. Kwaku Atuahene-Gima of China Europe International Business School, Shanghai, China for the track 'Marketing Innovation'.

### FUNDED RESEARCH PROJECT REPORT

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Assignment</th>
<th>Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Performance Evaluation of Banking Firms: A Risk Management Perspective, funded by Indian Institute of Management, Lucknow, October 2006</td>
<td>Prof. M. Jayadev &amp; Prof. Rudra Sensarma</td>
</tr>
</tbody>
</table>

### MANAGEMENT DEVELOPMENT PROGRAMMES

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the Programme</th>
<th>Programme Director/s</th>
<th>Venue &amp; Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>MDP for IRTS Officers</td>
<td>Prof. K.N. Singh &amp; Prof. D. Dasgupta</td>
<td>Lucknow, Oct.04-Nov. 29, 2006</td>
</tr>
<tr>
<td>4.</td>
<td>Team Building</td>
<td>Prof. Archana Shukla</td>
<td>Lucknow, Oct.09-13, 2006</td>
</tr>
<tr>
<td>5.</td>
<td>Business Planning and Growth Strategies for World Class Performance for GAIL Executives</td>
<td>Prof. Abhishek Nirjar &amp; Prof. M. Jayadev</td>
<td>Lucknow, October 11-13, 2006</td>
</tr>
<tr>
<td>8.</td>
<td>Strategic Consumer Products Marketing to Rural India</td>
<td>Prof. Saji K.B. Nair</td>
<td>Lucknow, October 26-28, 2006</td>
</tr>
</tbody>
</table>
### FORTHCOMING MANAGEMENT DEVELOPMENT PROGRAMMES

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the Programme</th>
<th>Programme Director/s</th>
<th>Venue &amp; Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Measuring and Enhancing Customer Profitability</td>
<td>Prof. Amit Mookerjee</td>
<td>New Delhi (Non-Residential) Nov. 01-03, 2006</td>
</tr>
<tr>
<td>2.</td>
<td>Competing in Emerging Markets</td>
<td>Prof. M. Akbar</td>
<td>Lucknow Nov. 06-10, 2006</td>
</tr>
<tr>
<td>6.</td>
<td>Managerial Effectiveness</td>
<td>Prof. Archana Shukla</td>
<td>Lucknow Nov. 20-24, 2006</td>
</tr>
<tr>
<td>7.</td>
<td>Enhancing Managerial Capability through Stress Management</td>
<td>Prof. Shailendra Singh</td>
<td>Lucknow Nov. 27-29, 2006</td>
</tr>
<tr>
<td>8.</td>
<td>Managing Projects Successfully in a Complex Environment</td>
<td>Prof. S.S. Sahay</td>
<td>Lucknow Nov. 27-Dec.01,2006</td>
</tr>
<tr>
<td>9.</td>
<td>Problem Solving Skills for Effective Performance</td>
<td>Prof. Sushil Kumar</td>
<td>Lucknow Nov.30-Dec.02,2006</td>
</tr>
<tr>
<td>17.</td>
<td>Corporate Social Responsibility &amp; Sustainable Business</td>
<td>Prof. Sushil Kumar</td>
<td>Lucknow Dec. 18-20, 2006</td>
</tr>
</tbody>
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COMMUNITY AFFAIRS

Mr. Dharmendra Singh (Library) successfully completed the Degree of Masters of Arts (Sociology) from the Chhatrapati Shahu Ji Maharaj University, Kanpur.

FROM THE PRESS

- A symbolic march and tree plantation ceremony was organized at the Indian Institute of Management (IIM) Lucknow to mark the birth anniversary of Mahatama Gandhi on Monday.

Led by Prof. D.S. Sengar, chairman, student affairs, students along with faculty members assembled at the central ground and took out a march till main gate, where they offered floral tributes at the sculpture of the Mahatama’s historic ‘Dandi March’ Students also launched the third phase of “adopt-a-tree” campaign.

Prof. Sengar, on the occasion, told students how West is learning a lot from teachings and philosophy of Gandhi. Harvard School of Business Management has recognised and crowned Gandhi as the “Management Guru” of the 20th Century, he said. About 50 universities and colleges in th US have launched courses on Gandhism in the last few years. In 2005, In Berlin, a school was renamed after Gandhi following demand by the students, he added.

[Excerpts from The Times of India, Lucknow, October 04, 2006, p.04]

- Students of Indian Institute of Management, Lucknow, (IIM-L), have adopted a village on the occasion of World Poverty Day.

Students led by chairman of student’s affair committee, Prof Dharmendra Sengar, on Tuesday visited Chakarpurwa village adjacent to the campus and interacted with the villagers to draw a strategy for all round development of the place.

The team, comprising PGP II students Anup Upadhayaya and Akash Mishra and administrative officer student’s affair Dinesh Saxena, met gram pradhan and recorded various problems faced by the people. They found that despite being close to the city, the village neither had electricity connection nor a recognised school. There was also no primary health centre in the village having a population of over 200 people. “We were shocked to see the level of ignorance in the village,” Prof Sengar later told TOI. The team interacted with villagers and took feedback on their requirements and available resources. Now they would chalk out a strategy for socio-economic development of the village. “To start with we have decided to work for electrification of the village, recognition of the school and setting up of a health centre,” said students.

The team also identified five bright children in the village. “We will teach and train these students, help them get higher studies, so that one day they can also aim at studying in IIM,” said Prof
Sengar. The gram pradhan was asked to write an application addressed to the government for electrification of the village and the school teacher was asked to prepare an application for the recognition of the school.

[Excerpts from The Times of India (Lucknow Times), Lucknow, October 18, 2006]

- Outstation girl students prefer celebrating festivals at home, while boys prefer to combine festivities with fun and friends!

...However, at IIM-Lucknow, it is business as usual. Swaraj Pradhan, a first year MBA student from Orissa, plans to utilise the time to complete his syllabus, “I need to prepare for the mock group discussions for summer job placements.

[Excerpts from The Times of India (Lucknow Times), Lucknow, October 20, 2006]

- A function to felicitate participants and students involved in the Adult Literacy Campaign was organised at the Indian Institute of Management, Lucknow, (IIM-L).

The event also marked the 100 days of the campaign The Adult Literacy Campaign (ALC) was launched by Bhavishya, a committee of IIM-L students, on July 6, 2006, with an aim to turning the campus into a 100 % literate place.

The illiterate workers and labourers on the campus were the target group for the campaign. Students employed best adult literacy practices in India and have zeroed in on certain scientific and proven techniques to expedite the learning process. They also used a software product customised for the understanding of the adult illiterates.

Bhavishya committee members, all IIM-L students, Anup Upadhyaya, Aakash Misra, Satyendra Choudhary, Rajiv Goyal, Krishnam Raju and Madhukar burnt midnight oil to achieve first level of the adult literacy campaign in just 100 days.

Prof D S Sengar on the occasion said workers should come forward to attend the literacy classes regularly. He reminded them how Ram Niwas, a gardener, became a full-time employee after becoming literate through a similar campaign.

Few workers shared their experiences in the class. One Shyam Sunder said, “We are fortunate to have got a chance of learning how to read and write. Earlier, I couldn’t sign or count my salary but now I can easily read and write both in Hindi and English.”

Ram Sundari said, “I have finished my Hindi course and now I am learning English. I like to read books and I am also contributing towards my children’s education.” The impact of the motivation was that the strength of literacy class has become double.

[Excerpts from The Times of India, Lucknow, October 27, 2006]


