

Electronic Commerce and Electronic Business

FOREWORD

This special issue is motivated by the recent upsurge of research activity in the areas of electronic commerce and electronic business both in India and all over the world. The current research activity is quite intensive in the use of mathematical tools such as cryptography, game theory, mechanism design, optimization, probability and statistics, and machine learning for modelling and improving the efficiency of transactions in e-commerce and e-business. There is a wide variety of challenging research problems in this area awaiting the attention of researchers and professionals in e-commerce and e-business. So, when Dr. Gangan Prathap and Prof. Vivek Borkar suggested to us in December 2003 that we bring out a special issue of *Sādhanā* on this topic, we readily agreed.

This special issue is targeted at researchers, research students, and industry research professionals interested in the areas of e-commerce and e-business. It has the objective of providing a state-of-the-art update of important recent technical advances and results in the area. The issue is the result of the efforts and initiative taken by leading researchers from active research groups in e-commerce. The authors are from academic institutions as well as from the industry.

We have a total of 18 papers in this special issue. These papers belong to three broad categories: (1) Building blocks and enabling technologies (four papers), (2) mechanisms, pricing, and business logic (9 papers), and (3) supply chains and electronic marketplaces (5 papers). These 18 papers can be classified into the following groups based on the nature of content of the articles: (a) Papers presenting a comprehensive survey of key technical and design issues in e-commerce and e-business, (b) papers presenting rigorous mathematical models to solve important research problems in e-commerce, and (c) papers describing the software architecture, design issues, and industry best practices.

The first four papers in this special issue present the important technological building blocks of secure and scalable e-commerce systems. Rajaraman presents a comprehensive overview of building blocks and foundational components of any e-commerce system. Sengupta, Mazumdar, and Barik present a detailed overview of security technologies as applicable to e-commerce systems. The important issue of trust management for secure e-transactions forms the subject matter of the article by Patil and Shyamasundar. Mallick, Sharma, Kumar, and Subrahmanya present the implementation issues when e-commerce is tailored for the retail sector.

The next nine papers discuss models and algorithms as are relevant in the important areas of modelling, design, and optimization of e-commerce systems. Narahari and Pankaj Dayama present a comprehensive survey on combinatorial auctions for e-business. This is followed by an article by Sandeep Dulluri and Raghavan on application of auctions to e-advertisements. Narahari, Raju, Ravikumar, and Sourabh Shah present a host of interesting pricing models for e-business. Siva Viswanathan and Anandalingam discuss issues relevant in pricing information goods. Interesting links between perishable goods inventory management and dynamic pricing enabled by emerging technologies such as RFID (radio frequency identification) are explored by Chande, Dhekane, Hemachandra, and Narayan Rangaraj.

This is followed by a survey article on data mining in e-commerce by Raghavan and a complementary article on data mining patterns by Shekar and Rajesh Natarajan. Demand sensing in e-business forms the subject matter of the article by Ravikumar, Atul Saroop, Narahari, and Pankaj Dayama. Monte Carlo methods for pricing financial options are then presented by Boliya and Juneja.

The next five papers are concerned with supply chains and e-marketplaces. Roshan Gaonkar and Viswanadham present an article on integrated planning in supply chains with buy-side and sell-side marketplaces. Vipul Jain, Wadhwa, and Deshmukh present the application of petri nets in modelling e-commerce-enabled supply chains. Madan Mohan discusses issues relevant in building successful e-marketplaces. Balasubramaniam and Tewary present issues relevant to collaboration in design of supply chains. Following this, Viswanadham and Poornima Luthra present models for measuring and predicting shareholder value, applicable to companies in the e-commerce domain.

We sincerely hope that this special issue, which has gone through careful planning, will be a useful resource for researchers, professionals, practitioners, and students in the area of e-commerce and e-business. We would like to acknowledge the support and encouragement of Dr. Gangan Prathap, Editor, and Prof Vivek Borkar, Associate Editor, *Sādhanā*. The authors are truly the backbone of this special issue. We express our grateful thanks to them for their support, time, initiative, and patience. The reviewers have been thorough and prompt in their reviews and their wonderful support has been a key contributing factor in bringing out this special issue in a record time of 15 months (from conception to market). The Academy Staff, coordinated efficiently by Ms. Shashikala, have played a key role in compressing the lead time to 15 months. We would also like to mention here that all activities involved in bringing out this special issue (correspondence with authors, submission of papers, review of papers, submission of final manuscripts, transmission of corrected proofs etc.) were completely accomplished through e-mail.

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