CURRENT ELECTRONIC COMMERCE RESEARCH

Contents
A.1 Overview
A.2 Study on the EC Research Taxonomies
A.3 List of Academic Journals in the EC Research
A.4 EC Research Taxonomy and Recent Articles
A.5 Concluding Remarks

Learning Objectives
Upon completion of this online appendix, you will be able to:
1. Understand the taxonomy of Electronic Commerce (EC) research and access the articles about the EC research taxonomy study.
2. Understand the resources on recent EC research published in the 26 academic journals during the period between January 1999 and August 2005.
3. Understand the trend of EC research according to the organization of this textbook.
4. Know the online sources on the topics of interest.
A.1 OVERVIEW

At the end of each chapter of the book *Electronic Commerce: A Managerial Perspective 2008*, we have added research topics so that readers can use them as milestones for their own research. To complement those research topics, we provide a review of recent literature in this appendix, so this online appendix is a companion to the research topics in the printed book.

The earlier 2004 version surveyed EC literature published between January 1999 and August 2003 in 27 academic journals relevant to EC. In this 2008 version, we used the same journals but extended the term to August 2005. Because one journal has ceased publication, this version is based on 26 journals. In addition, a small number of articles were selected from sources outside of these 26 journals. This longitudinal study provides us insight into what constitutes interesting recent research topics related to EC.

The goal of this appendix is to classify trends in recent EC research and provide references on each topic. We by no means intend to comprehensively analyze and comment on the literature in this appendix because it is too huge for this approach. Nevertheless, readers can find the topics of research efficiently by reading the taxonomy of topics and the summary of the articles within each topic. We provide online links to the journal, so readers can access the abstracts and full text easily on the Web if they subscribe to the relevant online journals. Readers can search topics and authors effectively using their software’s “Find” function.

To be compatible with *Electronic Commerce: A Managerial Perspective 2008*, we classify the literature according to the organization of the book. However, we classified the articles within a chapter in bottom-up fashion. This means that even if the book deals with a certain topic in depth, if there are no published articles on that topic, it is not handled here. On the contrary, even if a topic is not handled in the book, we handle it as a research topic if there are many related publications. In this manner, the book and this EC research appendix are complementary.

Before we present our own classification, we first review the articles that handle the taxonomy of EC research. Then, we provide the list of journals that we have adopted and statistics on the annual number of articles published by journal and by chapter. Each chapter is composed of review articles sorted by topic and appended references. This appendix covers 17 text chapters and concludes with a discussion on key trends in EC research.

A.2 STUDY ON THE EC RESEARCH TAXONOMIES

To understand the taxonomy of EC research, let us review articles on the topic. We found three useful articles for this purpose (Urbaczewski et al. 2002, Ngai and Wat 2002, Kauffman and Walden 2001).

According to Urbaczewski et al. (2002), EC research can be classified into four categories: organizational, economic, technical, and others. In this paper, 172 articles in a variety of academic journals are collected and classified according to this taxonomy. The detailed taxonomy adopted follows.

1. Organizational Research
   1. EC Overviews
   2. Electronic Data Interchange (EDI)/Interorganizational System (IOS)
   3. Electronic Markets (EM) Overview
   4. Adoption
      ‣ EC Adoption
      ‣ EDI/IOS Adoption
      ‣ EC Implementation
      ‣ EDI/IOS Implementation
   5. EC Diffusion and Use
      ‣ EDI/IOS Diffusion and Use
      ‣ EM Diffusion and Use
   6. EC Strategy Prescriptions
      ‣ Marketing Prescriptions
      ‣ Management of Technology Prescriptions
2. Economic Research
   1. Industry Structure, Asset Ownership, and Governance
      ‣ Electronic Markets Hypothesis
      ‣ Move-to-the-Middle Hypothesis
      ‣ Hybrid Forms of Ownership and Governance
2. Adoption and Distribution of IOS Value  
   ◗ Creating and Appropriating Surplus Value  
   ◗ Buyer-Advocated Adoption  
   ◗ Supplier Adoption  
3. Electronic Market Intermediaries  
   ◗ Market Makers  
   ◗ Market Roles  
4. Cost of Acquiring Information  

3. Technical Research  
   1. Agents  
   2. Data Integration  
   3. Security  
   4. Transaction Settlement  
   5. Digital Retailing Technologies  
4. Others  
   1. Social  
      ◗ International Development  
      ◗ Role of Government  
   2. Behavioral  
      ◗ Consumer Behavior  
   3. Legal  

Ngai and Wat (2002) classified the literature on EC research into four categories: applications, technological issues, support and implementation, and others. For the topics in these categories, 275 articles published between 1993 and 1999 are collected, and this appendix analyzes their distributions. The taxonomy adopted in this research follows.  

1. Applications  
   1. Interorganizational Systems  
   2. Electronic Payment Systems  
   3. Financial Services  
   4. Retailing  
   5. Online Publishing  
   6. Auctions  
   7. Intraorganizational EC  
   8. Education and Training  
   9. Marketing and Advertising  
10. Other Applications  
2. Technological Issues  
   1. Security  
   2. Technological Components  
   3. Network Technology and Infrastructure  
   4. Support Systems  
   5. Algorithm and Methodology  
   6. Other Technical Issues  
3. Support and Implementation  
   1. Public Policy  
      ◗ Taxation  
      ◗ Legal Issues  
      ◗ Privacy  
      ◗ Fraud  
      ◗ Trust  
   2. Corporate Strategy  
   3. Other Support and Implementation
4. Others
   1. General Introduction to EC
   2. Foundational Concept of EC
   3. Others

Kauffman and Walden (2001) surveyed the research on EC from the perspective of economic analysis. They also suggested a direction of research for each category and associated the categories with the relevant information technology and economic theories. They classified the EC research as follows:

1. Technology Issues
   1. Internet Access Pricing
   2. Intelligent Agents in EC
   3. Search Costs and Tools
   4. Definition of EC Standards

2. Product Issues
   1. Pricing of Digital Products
   2. Characteristics of Internet Products
   3. Bundling, Sharing, and Differentiation
   4. Adoption and Network Externalities

3. Business Process
   1. Electronic Data Interchange (EDI)
   2. Government and the Location of Transactions
   3. Valuation of EC Technology Investments
   4. EC Business Models

4. Market Issues
   1. Intermediation
   2. Physical and Electronic Markets
   3. Electronic Auctions
   4. Network Externalities and Market Efficiency
   5. Design of Electronic Markets
   6. Trust

5. Macroeconomic Issues
   1. Measurement of Digital Economy
   2. Electronic Labor Markets
   3. Electronic Money
   4. Taxation and Regulation of EC
   5. Economic Transformation
   6. Electronic Government
   7. International EC

A few articles analyzed the trends in Information Systems (IS) research. Even though the studies on IS research trends did not focus on the direction of EC research, they provide insight into this field. Liang and Chen (2003) studied 3,841 articles published in eight major journals during the 1980–2001 period. They classified the research topics into five categories and analyzed the trend over time. The five categories are human, system, technology and analysis model, management, and research methodology and theory. They discovered that there were more human and fewer system-related publications as time passed. They also studied the frequency that theories were adopted in MIS research over time, and discovered that human-related theories, such as the Technology Acceptance Model (TAM) and Resource Reliant Theory, were popular and system-related theories, such as Media Richness and Task Technology Fit, were less popular. Of the 69 articles that used the TAM, more than half were published during the last five years of the period studied.

The 10 theories studied in Liang and Chen’s research follow. These theories may be applicable to the theory research in EC as well, but it is not desirable to repeat the test of the same axiomatic theories without additional research themes.

- Transaction Cost Theory
- Diffusion Theory
- Network Externality Theory
- Media Richness Theory
Technology Acceptance Model
Resource Reliance Theory
Social Exchange Theory
Structuring Theory
Task Technology Fit
Social Cognitive Theory

Orlikowski and Iacono (2001) argued that the journal *Information Systems Research* has not deeply engaged its core subject of IT artifacts. Because this argument may also be applicable to the research on EC, it will be useful to consider the IT artifacts from the point of view of EC artifacts. The IT artifacts proposed are:

1. Tool View of Technology
   1. Labor Substitution Tool
   2. Productivity Tool
   3. Information Processing Tool
   4. Social Relations Tool
2. Proxy View of Technology
   1. Perception
   2. Diffusion
   3. Capital
3. Ensemble View of Technology
   1. Development Project
   2. Production Network
   3. Embedded System
   4. Structure
4. Computational View of Technology
   1. Algorithm
   2. Model
5. Nominal View of Technology

As we reviewed previously, there is no single taxonomy of EC research. Therefore, it is desirable to develop a framework using the EC book's point of view.

**REFERENCES**


**A.3 LIST OF ACADEMIC JOURNALS IN THE EC RESEARCH**

Twenty-six academic journals were selected for the survey of EC research articles. The journals encompass ones with titles including *Electronic Commerce* or a similar term and MIS journals that cover EC articles. From these journals, we have picked 1,268 articles published during the term January 1999–August 2005 that are relevant to the subjects in the book *Electronic Commerce: A Managerial Perspective 2008*.

The selected journals, in alphabetic order with the titles linked to their online sources, are the following:

- Communications of the ACM
- Decision Sciences
- Decision Support Systems
- Electronic Commerce Research
Appendix A: Current Electronic Commerce Research

- Electronic Commerce Research and Applications
- Electronic Markets
- e-Service Journal
- European Journal of Information Systems
- Information and Management
- Information Resources Management Journal
- Information Systems Management
- Information Systems Research
- International Journal of Electronic Commerce
- International Journal of Information Management
- Internet Research
- Journal of Electronic Commerce Research
- Journal of Interactive Marketing
- Journal of Internet Banking and Commerce
- Journal of Internet Commerce
- Journal of Management Information Systems
- Journal of Organizational Computing & Electronic Commerce
- Management Science
- MIS Quarterly
- Quarterly Journal of Electronic Commerce
- The Information Society
- World Wide Web
- Miscellaneous Publications

The journal Quarterly Journal of Electronic Commerce ceased publication, so the articles published earlier are included in the category Miscellaneous. Among the 1,268 articles, 27 articles fall into the category Miscellaneous because they were selected from other sources accidentally. We say it was “accidental” because we included these relevant materials in the earlier edition, which were already known to us, without conducting a full survey of the journals where they were published. These journals include Behavior & Information Technology, California Management Review, Expert Systems, IEEE Intelligent Systems, IEEE Wireless Communications, Industrial Marketing Management, Information Systems Journal, Information Technology and Management, International Journal of Information System, Journal of Computer Information Systems, Journal of Global Information Management, Journal of Information Technology Cases and Applications, and McKinsey Quarterly.

Exhibit A.1 shows the number of articles selected for use in this appendix.

A.4 EC RESEARCH TAXONOMY AND RECENT ARTICLES

In this section, the 1,268 selected articles in EC research are classified according to the organization of the textbook Electronic Commerce: A Managerial Perspective 2008 so that readers can find the research issues and relevant literature while reading the book. The EC research is classified according to the first 17 chapters of the book, though the titles of the research topics in each chapter are named in the bottom-up fashion described previously. If there are too many articles in a topic, the topic is reclassified into more specific topics.

The titles of the chapters and research subjects are summarized as follows:

PART I INTRODUCTION TO E-COMMERCE AND E-MARKETPLACES

CHAPTER 1. OVERVIEW OF ELECTRONIC COMMERCE
  - Impact of EC
  - E-Business Models
  - Diffusion of EC
  - Comparative Regional Studies in EC

CHAPTER 2. E-MARKETPLACES: STRUCTURES, MECHANISMS, ECONOMICS, AND IMPACTS
  - Benefits and Performance of E-Marketplaces
  - Role of Intermediaries and Channel Conflict
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**Note:** Vertical columns add up to 101% due to rounding.
PART II B2C EC—INTERNET CONSUMER RETAILING

CHAPTER 3. RETAILING IN ELECTRONIC COMMERCE: PRODUCTS AND SERVICES

- Electronic Retailing Strategy
- Performance of Electronic Retailers
- Pricing Issues in Electronic Channels
- Channel Conflict and Its Resolution
- Online Services and Distribution of Digital Products
- Pricing of Online Services
- Software Agents to Aid Customers’ Purchase Decisions
- Cognition of Virtual Environment on the Internet
- Internet Banking
- Online Stock Trading

CHAPTER 4. CONSUMER BEHAVIOR, MARKET RESEARCH, AND ADVERTISEMENT

- Online Consumer Behavior Models
- Factors That Influence Online Customers
- Online Search Behaviors
- Metrics of Online Customer Satisfaction
- Effect of Brand in E-Commerce
- Online Product Category
- Building Trust in EC
- Impact of Trust on Online Customers
- Measure and Control of Trust in B2C E-Commerce
- Internet Market Research
- Impact of Online Advertising
- Online Advertising Methods

PART III BUSINESS-TO-BUSINESS E-COMMERCE


- Status of B2B EC
- B2B Critical Success Factors
- B2B Alliance and Relationship Management
- Trust in B2B Partnering
- E-Procurement
- Agents in B2B EC
- Electronic Data Interchange (EDI) for B2B EC
- Web Services in EC


- B2B Marketplaces
- B2B Intermediaries
- Evaluation of B2B E-Marketplaces
CHAPTER 7. E-SUPPLY CHAINS, COLLABORATIVE COMMERCE, AND CORPORATE PORTALS
- Overview of Supply Chain Management
- Performance of SCM
- Design and Technologies for SCM
- Information Sharing for SCM
- B2B Integration with ERP
- Collaborative Commerce
- Groupware in Collaborative Commerce
- Interorganizational Workflow
- Intranet and Corporate Portal

PART IV OTHER EC MODELS AND APPLICATIONS
CHAPTER 8. INNOVATIVE EC SYSTEMS: FROM E-GOVERNMENT AND E-LEARNING AND CONSUMER-TO-CONSUMER COMMERCE
- E-Government
- E-Democracy and Internet Voting
- E-Learning
- E-Learning Systems
- Knowledge Management in EC
- P2P Computing

CHAPTER 9. MOBILE COMPUTING AND COMMERCE AND PERVERSIVE COMPUTING
- M-Commerce and Ubiquitous Computing
- Adoption of M-Commerce
- M-Commerce Applications and M-Payment
- M-Commerce Technologies
- Software and Software Agents for Ubiquitous Computing
- Social Issues in Ubiquitous Computing

PART V EC SUPPORT SERVICES
CHAPTER 10. DYNAMIC TRADING: E-AUCTIONS, BARTERING, AND NEGOTIATIONS
- E-Auction as Negotiation and Dynamic Pricing
- Design of Auction Mechanisms
- Software Agents for Auction Systems
- Performance of Auctions
- Application of Auctions
- Complex Auctions
- Bidder Behavior
- Security in E-Auctions

CHAPTER 11. E-COMMERCE SECURITY
- Imperatives of EC Security and Methodologies
- EC Security Design
- Public Key Infrastructure and Digital Signatures
- Authentication and Digital Certificates
- Intrusion Detection and Firewalls
- Trust and Security
CHAPTER 12. ELECTRONIC PAYMENT SYSTEMS
- E-Payment Systems
- Micropayments
- Smart Card in E-Payments

CHAPTER 13. ORDER FULFILLMENT, eCRM, AND OTHER SUPPORT SERVICES
- Order Fulfillment in EC
- Application Service Providers
- Content Management
- Search Engines and Portals
- Customer Relationship Management in EC
- Data Mining in CRM and Personalization
- Outsourcing EC Support Services

PART VI EC STRATEGY AND IMPLEMENTATION

CHAPTER 14. E-COMMERCE STRATEGY AND GLOBAL EC
- Critical Success Factors of EC
- Strategies for EC Applications
- Assessment of EC and the Balanced Scorecard
- EC Technology Adoption
- Global EC
- National Study on EC
- Small and Medium Enterprises in EC

CHAPTER 15. ECONOMICS AND JUSTIFICATION OF ELECTRONIC COMMERCE
- Cost-Benefit Analysis for E-Business
- Effectiveness of IT Investment

CHAPTER 16. LAUNCHING A SUCCESSFUL ONLINE BUSINESS AND EC PROJECTS
- Web Site Design
- Web Site Development
- Web Site Evaluation Factors and Methods
- Empirical Evaluation of Web Sites
- Users’ Attitudes About Web Sites

CHAPTER 17. LEGAL, ETHICAL, AND COMPLIANCE ISSUES IN ELECTRONIC COMMERCE
- Fraud on the Internet
- Intellectual Property Rights
- E-Taxation
- Freedom of Speech
- Anonymity
- Issues in Privacy
- Programs for Privacy Protection
- Social and Legal Issues in EC
- Virtual Communities
- Virtual Community Applications
- Virtual Teams

Exhibit A.2 summarizes the number of articles published for each chapter. For each subject, the themes of relevant articles are summarized and their sources are introduced.
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**Note:** Vertical columns add up to 99% due to rounding.
CHAPTER 18. SOCIAL NETWORKS AND INDUSTRY DISRUPTORS IN THE WEB 2.0 ENVIRONMENT
This emerging new topic has very few publications at the moment. However, the number is increasing and several EC-related conferences include articles on the topic.

CHAPTER 1. OVERVIEW OF ELECTRONIC COMMERCE

IMPACT OF EC
Bouwman (1999) contrasts commerce in the electronic environment with that in the physical environment, and Steinfeld et al. (1999) discuss the potential synergy of EC for local merchants. Saanen et al. (1999) present a snapshot of EC’s opportunities and threats, and Schmid (2001) reviews the state of the digital economy. In contrast, Colman et al. (2002) argue that the claim that e-business is driving revolutionary business change is misleading and only partially correct and that the most likely path for the evolution of e-business is incremental.

Zwass (2003) explores the aspects and opportunities of EC for organizational innovation. Hengst and Sol (2002) derive a framework to evaluate the impact of EC on interorganizational coordination and apply it to the container transport industry. Several articles study the impact of EC on various aspects of commerce: corporate communication (Johnston 2001), business level strategies (Fruhling and Digman 2000), and replenishment in supply chains (Leonard et al. 2002).

The innovation and impact of EC is studied from the points of view of four stakeholders: providers, e-commerce companies, customers, and complementors (Wu and Hisa 2004). Hackbarth and Kettinger (2004) suggest that firms adopt accelerated leapfrogging strategies when faced with more severe external competitive pressures. Zhuang and Lederer (2004) reconfirm the importance of CEO commitment and planning as more significant in featured sites such as publishing applications, catalog applications, interactivity, and interfaces than in transaction applications.

Geoffrion and Krishnan (2003a) discuss the mutual impact of e-business and management science, and conclude that the digital economy is giving birth to new research questions in three main ways: by enabling and popularizing several types of technology-mediated interactions, by spawning large-scale digital data sources, and by creating recurring operation decisions that need to be automated. Geoffrion and Krishnan (2003b) also conclude that digital economy researchers make great use of economics and computer science/information technology and exploit the improving productivity advantages of empirical and methodological work in comparison with theoretical work.

E-BUSINESS MODELS

As a methodology for designing and deploying electronic enterprises, Rodríguez (2003) proposes a cyclical model consisting of three e-business development phases: conceptualization, simulation, and implementation. Koo et al. (2004) apply Porter’s model of competitive strategies (cost leadership, market differentiation, innovative differentiation, and market focus) to 123 Korean firms and find that online firms incline toward differentiation strategies, whereas click-and-mortar firms prefer market focus strategies.

DIFFUSION OF EC

Forman et al. (2005) examine the sources of geographical variance in commercial Internet use by contrasting the global village theory and urban density theory with their proposed industry composition theory. They argue that the demand for the Internet is increasing with location size because of the concentration of information-intensive firms in urban areas.

COMPARATIVE REGIONAL STUDIES IN EC
Several articles conduct regional studies by comparing two countries or by studying a particular region and country in depth. Von Slyke et al. (2005) compare American and Indian consumers’ perceptions of e-commerce and find that the consumers perceive the relative advantage, ease of use, compatibility, and demonstrability of results of e-commerce differently.
A number of studies focus on EC in China. Zhu and Wang (2005) study the diffusion, use, and effect of the Internet in China, and Chen et al. (2004) study E-MBA students’ perceptions of the extent to which Chinese businesses are ready for EC. Chen and Ning (2002) study the constraints on EC in China, Davison et al. (2005) propose the e-transformation of Western China, and Ma et al. (2003) study how adoption of information and communication technology (ICT) and the Internet will affect China’s tourism industry.

A number of articles focus on various aspects of EC in the Asian and Pacific region including: the impact of broadband penetration on e-business implementation experience in Korea (Lee et al. 2003), the global and national factors affecting EC diffusion in Singapore (Wong 2003), empirical perspectives of e-commerce in Hong Kong (Gunasekaran and Ngai 2005), EC development in Malaysia (Le and Koh 2002), EC from an Islamic perspective (Zainul et al. 2004), corporate customer perspectives on the business value of Thai Internet banking (Rotchanakitumnuai and Specce 2004), and a review of e-readiness in the developing countries of the South Pacific (Purcell and Toland 2004). Rolfe et al. (2003) explore the use of the Internet by landholders in rural Australia, with an intention to understand the motivational factors associated with a marked increase in usage.

The studies about Europe include explorations of the digital economy and management in Spain (Águila et al. 2003), the situation and potential of B2C EC in Greece as of 2000 (Kardaras and Papathanassiou 2000), and the impact of Internet trading on the U.K. antiquarian and secondhand book-selling industry (Whewell and Souitaris 2001). Brousseau (2003) analyzes the impact of early adoption of Minitel and EDI in the 1980s in the deployment of the Internet in France.

The other country and regional studies include examinations of Brazil in the age of EC (Tigre 2003), development of EC in Mexico (Palacios 2003), and the Internet-based telemedicine system in Nigeria (Adewale 2004).

REFERENCES


### CHAPTER 2. E-MARKETPLACES: STRUCTURES, MECHANISMS, ECONOMICS, AND IMPACTS

**BENEFITS AND PERFORMANCE OF E-MARKETPLACES**

ROLE OF INTERMEDIARIES AND CHANNEL CONFLICT


INDUSTRY SPECIFIC E-MARKETPLACES


E-CATALOG AND PERSONALIZATION


In several articles, personalization is attempted for different areas: the personalized recommendation procedure (Kim et al. 2002), information access to e-catalogs (Yen and Kong 2002), B2B interaction (Ardissono et al. 2002), and comparison shopping (Yuan 2002). Raghu et al. (2001) analyze a model for dynamic profiling of consumers for customized offerings, and Schein et al. (2005) propose a framework named CROC that evaluates the recomender systems.

Yen and Kong (2002) propose a personalized electronic catalog system to synthesize the customization of information content, organization, and display, and Schubert (2000) proposes a participatory product catalog to provide personalization strategies on the basis of customer profiles and to allow a collaborative mechanism for the buying process.

AGENT-BASED ELECTRONIC MARKET MECHANISMS

Deveaux et al. (2001) analyze an agent-based Internet market in the setting where noncooperative agents using behavioral rules negotiate the price of a given product in a bilateral and sequential manner. Kang and Han (2002) suggest a broker-based synchronous transaction algorithm that would guarantee a more fair and efficient transaction deal for both sellers and buyers. Ken and Rosemary (2002) propose an architecture to implement a continuous double auction modeled for the New York Stock Exchange specialist system.

Wang et al. (2002) propose a framework of Internet marketplaces on the basis of mobile agents, and Mandry et al. (2000) characterize the opportunities of mobile agents, review the risks of mobile agents, and characterize the protection mechanisms.

See also Chapter 9 for software agents for ubiquitous computing.

REFERENCES


CHAPTER 3. RETAILING IN EC: PRODUCTS AND SERVICES

ELECTRONIC RETAILING STRATEGY

Otto and Chung (2000) introduce a framework that compares and contrasts the general advantages and disadvantages of EC with traditional retailing, and Ba et al. (2005) study the conditions under which people will stick to the traditional market and face-to-face transactions, and those that will lead to electronic transactions’ becoming the convention of the future. Strader and Ramaswami (2004) contrast investors’ perceptions of traditional and online channels, and Gupta et al. (2004) examine the relationship between purchase decisions and channel switching intentions.

Ranganathan (2003) describes how to manage the transition to brick and click. Rao (1999) argues that traditional retailers have to critically consider the migration to digital domain and, conversely, that e-tailers have to learn from their counterparts in the physical world. Multichannel research in marketing is relevant to this issue, although many have not focused on the contrast of online and offline channels.


**PERFORMANCE OF ELECTRONIC RETAILERS**

Zhuang and Lederer (2003) use a survey to identify 27 instruments that measure the benefits of electronic retailing and classify them into five categories. Kwon et al. (2002) study the impact of Web site design factors on consumer rating of Web-based auction sites empirically. Schubert (2002) proposes the Extended Web Assessment Method to evaluate EC applications from the customer’s point of view, and Barnes and Vidgen (2001) use the WebQual method to evaluate Internet bookshops.

Muylle and Basu (2004) study the extent to which companies in various industries support online sales, and Tamimi et al. (2003) survey the status of online retail using 55 sample online retailers. Dixon and Quinn (2004) survey the impact of EC on franchising, and Craig et al. (2003) examine the critical role that information access plays in shaping global markets.

Alfred and Chakraborty (2004) identify the types of products that consumers are willing to buy online and analyze the success and failure of dot-com companies, and Seringhaus (2005) surveys the issue of online selling of luxury brands.

Heikilä et al. (2000) analyze entrepreneurial opportunities created by the electronic grocery shop, and Seiber (2000) presents results from interviews conducted with three leading online grocery shops in Switzerland and surveys of 1,003 online customers. Mahfouz (2005) analyzes a success case of an apparel e-tailer, Lands’ End. O’Reilly and Finnegan (2005) argue that performance of interorganizational systems depends not only on the fit between information processing needs and capabilities but also on the value added and value demanded, governance and investment, and trust and security. This was tested with an e-marketplace of the cotton industry.

**PRICING ISSUES IN ELECTRONIC CHANNELS**


Elmaghraby and Keskinocak (2003) review dynamic pricing in the presence of inventory consideration, and Biller et al. (2005) show that dynamic pricing in coordination with production and inventory decisions can increase profit in the automotive industry. Terwiesch and Lock (2004) raise the issue of pricing customized products.

Leloup (2003) investigates the optimal pricing strategies of a selling agent that is randomly matched with several heterogeneous buying agents whose reservation prices are initially unknown, and Lee (2000) examines the effect of intelligent agents on pricing in EC.

CHANNEL CONFLICT AND ITS RESOLUTION

Tsay and Agrawal (2004) discuss developments in Internet-Based commerce and third-party logistics that have led many companies to consider engaging in direct sales, which in turn affects distribution strategy. They examine ways to change the manufacturer-reseller relationships such as in wholesale pricing, paying the reseller a commission for diverting customers toward the direct channel, or conceding the demand fulfillment function entirely to the reseller. These methods could be mutually beneficial in that they achieve a division of labor according to each channel’s competitive advantage.

Conflicts that arise from the partnerships formed in order to facilitate the internationalization of retail operations in the fashion sector are studied by Moore et al. (2004). A detailed study of the relationships of ten international fashion retailers found that these relationships face significant tensions with respect to strategy non-compliance, perceptual disagreements, and arguments concerning the demarcation of decision making responsibility.

King et al. (2004) discuss Web-based channels as an integral part of the channel strategy of traditional off-line retailers. Using a game-theoretic approach to study the impact of Web-based e-commerce on retailers’ choices of distribution channel strategies, the authors uncover possible outcomes to the multichannel strategy that includes both Web-based channels and pre-existing off-line channels. Other possible outcomes are: all sellers continue to sell via traditional off-line channels; some sellers adopt a coordinated dual-channel strategy (i.e., both on-line and off-line) when faced with competition from Web-based entrants; off-line sellers continue to sell via off-line channels when faced with purely on-line competition.

A multiplechannel distribution system in which a manufacturer sells its product through an independent retailer as well as through his wholly-owned channel is studied by Boyaci (2005). He investigates coordination mechanisms, and shows that most of the recognized contracts do not accomplish coordination. He finds the exception to this is an appropriately designed penalty contract that does coordinate the supply chain, but is hard to implement.

Gilliland studies the facets of incentive rejection and incentive compatibility in channel conflict resolution. He suggests a four-step, theory-based process to help suppliers craft attractive incentive programs. The process involves identifying resellers’ performance needs, recognizing how each need suggests a different basis for incentive rejection, and designing an incentive package such that the incentives support specific reseller needs.

Rangan shows how any member of a distribution channel can learn how to shape an effective, evolving, and mutually beneficial channel strategy. Three disciplines to deal with the complex distribution environment successfully include mapping the industry channel, building and editing one’s own channel, and aligning and influencing one’s channel value chain.

Due to globalization, more U.S. companies are going international. Many use a direct exporting approach that relies on foreign channel members to distribute the product in the host country, over time, strategic alliances among distribution partners may form based on trust, commitment, and cooperation. Mehta et al. (2006) examines whether cultural differences do affect trust, commitment, and cooperation in international marketing channel alliances between U.S. exporters and their foreign distribution partners. They found that the greater the cultural differences between channel partners, the lower the levels of trust, commitment, and cooperation. Managerial implications are discussed, and study limitations are identified.

ONLINE SERVICES AND DISTRIBUTION OF DIGITAL PRODUCTS

Cho and Park (2002) classify the services and service products in EC into four categories: mass service, interactive service, supporting service, and professional services. Keen et al. (2000) present an empirical analysis of consumer preferences regarding alternative service delivery modes in e-service markets, and Rust and Lemon (2001) examine the importance of interactivity with consumers in e-services. Mittal and Sawhney (2001) document a field experiment that showed that both content-based and process-based learning are important in electronic information and product services.

describe the phenomenon of digital technology and change of the music industry because of the Internet, and Altinkemer and Bandypadhyay (2000) and Zhu and MacQuarrie (2003) study the effect of bundling digitized music.


**PRICING OF ONLINE SERVICES**

West (2000) examines the pricing and delivery strategies of online database vendors and addresses how each strategy specifically compensates for the property of information as a public good. Jain and Kannan (2002) examine various issues, models, and analysis of pricing information products on the online server.

Strategies in forward and spot buying of information goods are proposed by Gundepudi et al. (2001), and Hess (1999) discusses the case of Bertelsmann Professional Information. Sundararajan (2004) analyzes optimal pricing of information goods given incomplete information, and Bhargava and Sundaresan (2003) demonstrate that quality-contingent pricing is a useful mechanism for mitigating the negative effects of quality uncertainty in information goods.

Jagannathan et al. (2002) propose pricing algorithms for batched content delivery systems and simulate their performances, and Gallaugher et al. (2001) present an empirical exploration of the revenue stream for digital content providers.

**SOFTWARE AGENTS TO AID CUSTOMERS’ PURCHASE DECISIONS**

Pereira (2001) investigates the influence of search engines on consumer decision making in EC, and Rowley (2000) describes the search facilities offered by shopping bots. Redmond (2002) evaluates the potential impact of artificial shopping agents in EC markets, and Maes et al. (1999) discuss how software agent technologies can be used to automate several of the most time-consuming stages of the buying process.


Leloup (2003) investigates the optimal pricing strategies of a selling agent that is randomly matched with several buying agents, and Guan et al. (2004) propose a product-brokering agent that understands user preference toward a product category and can recommend a list of preferred products. Yang and Chang (2004) present an intelligent agent that monitors the posting of Web financial information providers and utilizes user profiles and user feedback to learn user preference, and Pham and Ye (2003) propose a self-restraining and self-stimulating control of agent interaction to meet deadlines.

Mathieson et al. (1999) examine the motivations and constraints of Web-based consumer decision tools, and Sproule and Archer (2000b) apply a DSS approach to provide an agent search, choice, and interface support capabilities. Vahidov and Fazlollahi (2004) propose a framework for a pluralistic multi-agent decision support system.

Aberg and Shahmehri (2000) propose the concept of Web Assistant to provide human-computer collaborated service for EC, and Moon et al. (2000) suggest a next generation multimedia call center for Internet-based EC. Yoo and Kim (2000) research the effectiveness of link structure for convenient cybershopping, and Prasad (2003) reviews the literature on the application of artificial intelligence for e-commerce.

See also the use of electronic catalogs and personalization reviewed in Chapter 2.

**COGNITION OF VIRTUAL ENVIRONMENT ON THE INTERNET**

Li et al. (2001) use the protocol analysis to observe 13 different types of psychological activities and then classify them into five characteristics of virtual experience: active process, presence, involvement, enjoyment, and affordance. Klein (2003) presents two experiments showing that user control and media richness both contribute to creating a sense of telepresence.

INTERNET BANKING


Aladwani (2001) presents a field study on the perceptions of bank executives, IT managers, and potential customers with regard to the drives, development challenges, and expectations in online banking. Acharya and Kagan (2004) examine the factors that affect a community bank's decision to develop an Internet-based application.


Several articles present Internet banking cases: in the United Kingdom (Jayawardhena and Foley 2000), Danish retailing banking (Mols 2000), Malaysia (Guru 2000, Vijayan and Shanmugam 2003), Thai (Ratchanakitumnuai and Speece 2004), Jordan (Awamleh et al. 2003), and Saudi Arabia (Jasimuddin 2001).

ONLINE STOCK TRADING


Hong (2000) explores some aspects of using electronic brokerage and discusses the information processing costs in online stock trading for naïve online investors. Strader and Inapudi (2004) present users’ perceptions of costs and benefits of using mobile versus online or PC-based channels for financial information and transactions. Balasubramanian et al. (2003) present results from an experiment that found that perceived trustworthiness is a significant antecedent to online investor’s satisfaction.


REFERENCES


CHAPTER 4. CONSUMER BEHAVIOR, MARKET RESEARCH, AND ADVERTISEMENT

ONLINE CONSUMER BEHAVIOR MODELS


Moe and Fader (2004a) study dynamic conversion behavior of visit and purchase at EC sites, and Huang (2003) demonstrates the impact of information load and emotion on the virtual exploratory and shopping decision. Luo and Seyedan (2003) present an empirical test that shows that customers’ perceived contextual marketing and customer-oriented strategies are associated with site satisfaction and loyalty.

Zhao et al. (2004) compare two knowledge discovery approaches (decision tree and neuro-fuzzy systems) to predict customers’ attitudes toward Internet retailers relative to traditional retailers. Heldal et al. (2004) propose a model that measures relationships between customers and corporate Web sites.


Regional studies on online shopping behavior were conducted for the following populations: rural residents (Broekemier and Burkink 2004), New Zealand consumers (Shergill and Chen 2004), students in the United States and Ireland (Comegys and Brennan 2003), and online behavior in 26 countries (Mahmood et al. 2004).

FACTORS THAT INFLUENCE ONLINE CUSTOMERS

Heijden et al. (2003) present an empirical analysis of factors that influence consumers’ intentions to purchase online, and Chau et al. (2002) study the impact of cultural differences on online consumer behavior.


Hong et al. (2004) study the effects of flash on information search performance and perceptions, and Jiang and Benbasat (2005) study the effects of visual and functional control of products on perceived diagnosticity and flow in eShopping. The impact of gender differences is studied in perceptions of Internet shopping by von Slyke et al. (2002), in shopping behavior by Schimmel (2003), and in online privacy concerns and resultant behaviors by Sheehan (1999).


ONLINE SEARCH BEHAVIORS


Constantinides (2004) studies the influence of Web experience on online consumers’ behavior, and Nyveman and Pedersen (2004) discuss the fact that general Internet experience moderates the effects of interactive application. Hennig-Thurau et al. (2004) argue that consumers’ desire for social interaction, desire for economic incentive, and potential to enhance their own self-worth lead to electronic word-of-mouth behavior, and Hennig-Thurau and Walsh (2003) argue that consumers read electronic word-of-mouth articulations mainly to save decision-making time and make better buying decisions.
Appendix A: Current Electronic Commerce Research


**METRICS OF ONLINE CUSTOMER SATISFACTION**


Heijden and Verhagen (2004) propose a conceptual foundation and empirical measurement of online store images, and Luarn and Lin (2003) present findings that trust, customer satisfaction, perceived value, and commitment are key constructs that determine the loyalty of consumers.

Devaraj et al. (2002) find that online customer satisfaction about decision making process support is mediated by cost saving and time saving, and Wu and Padgett (2004) present a direct comparative framework that contrasts with the traditional expectancy–disconfirmation paradigm.

In the investment domain, Balasubramanian (2003) found that perceived trustworthiness is a significant antecedent, and perceived environment and perceived operational competence impact the formation of trust. Lightner (2004) proposes a list of 50 functional requirements that represent facets for customer service in a B2C site.

**EFFECT OF BRAND IN E-COMMERCE**

Chu et al. (2005) study the role of online retailer brand and intermediary reputation on consumer purchase intention, and Marshall and Na (2003) present an experiment on the role of brand strength in the relationship between the medium of communication and perceived credibility of the message.

Müller and Chandon (2003) explore the impact of visiting a brand Web site on brand personality (youthfulness/modernity and sincerity/confidence). Murphy et al. (2003) study how the world’s top brands use domain names to extend their brands online, proving that Internet messages of strong brands have similar credibility as print media. Raney et al. (2003) study the effect of including entertaining and interactive contents on automotive Web sites and brands.

**ONLINE PRODUCT CATEGORY**

There are a number of studies on the effect of product types, shopping orientations, and attitudes on intention to shop (Vijayasarathy and Jones 2000, Vijayasarathy 2003, Vijayasarathy 2002). Lowengart and Tractinsky (2001) present a model of differential effects of product category on shoppers’ selection of online stores. Phau and Poon (2000) investigate factors influencing the types of products and services purchased over the Internet.

**BUILDING TRUST IN EC**


Jones et al. (2000) discuss trust requirements in e-business, and Vaidyanathan and Devaraj (2003) discuss five risk factors in e-business including the use of new services, new business models, new processes, new technology, and new fulfillment processes. McKnight and Chervany (2001) analyze the typology of trust, and Schoder and Haenlein (2004) present an empirical test showing that institutional trust is more important than other trust constructs like calculative and relational trust in the online world. Birkhofer et al. (2000) distinguish the transaction-based conceptual approach from the trust-based approach in EC.

Kleist (2004) studies the transaction cost model of electronic trust in terms of transaction return, incentive for network security, and optimal risk in digital economy, and Uslaner (2004) discusses the influence of basic trust in offline society on the online trust. In Vijayasarathy’s (2004) augmented Technology Acceptance Model, compatibility and security turned out to be a significant factor in predicting the consumer’s intentions to use online shopping. Privacy was not a significant factor.

Kim et al. (2004) present exploratory–descriptive research on the extent of assurance services in Web sites that provide information goods and services, and Noteberg et al. (2003) assess electronic channel assurance on purchasing likelihood and risk perception.

IMPACT OF TRUST ON ONLINE CUSTOMERS
Luarn and Lin (2003) study the influence of trust on customer loyalty along with the antecedents of customer satisfaction and perceived value, and Thatcher and George (2004) study it along with commitment and social involvement.


MEASURE AND CONTROL OF TRUST IN B2C E-COMMERCE

Luo and Najdawi (2004) present a review of five trust-building measures deployed by health Web sites. Pennington et al. (2003) demonstrate that the vendor guarantee as a trust mechanism has a direct influence on system trust. Two articles examine the role of third-party seals in building trust online (Cook and Luo 2003 and McKnight et al. 2004). Tang et al. (2003) study how insurance is adopted to create trust on the Internet.


Koufaris and Hampton-Sosa (2004) propose a model that explains how new customers develop initial trust in an online company; and Einwiller (2003) surveys the role of reputation in engendering trust.

Pavlou and Gefen (2004) integrate sociological and economical theories about institution-based trust in building effective online marketplaces.

For trust in B2B partnering, see Chapter 5; for trust and security, see Chapter 11.

INTERNET MARKET RESEARCH

Evans and Mathur (2005) discuss the value of online survey research and its weaknesses.

IMPACT OF ONLINE ADVERTISING


Yoon (2001) studies what makes the Internet a choice of advertising medium, and Drèze and Husssherr (2003) claim that brand awareness and repetition are important to improve the click-through rate. Calisir (2003) examines how Web advertising is perceived to be very far from most of the other eight traditional media to young consumers.

Lee et al. (2003) estimate the value of Internet information by using the hedonic price model. Wolin and Korgaonkar (2003) present a survey on gender differences in Web advertising, with the results indicating that males exhibit more positive beliefs and attitudes toward Web advertising than females. Lace (2004) reports the experiences of U.K. advertisers.

ONLINE ADVERTISING METHODS
Chiagouris and Mohr (2004) evaluate the effectiveness of Internet advertising tools. Shae et al. (2001) design an architecture that implements the transactional multimedia banner as Web access point, and Bhatnagar and Papatla (2001) examine the issue of identifying locations for targeted advertising on the


REFERENCES


Appendix A: Current Electronic Commerce Research


STATUS OF B2B EC

Soliman (2003) surveys the major issues in adopting B2B EC from the CIO’s perspective, and Deeter-Schmelz and Kennedy (2002) explore the degree to which the purchasing professional’s perceptions influence the Internet as an industrial communication tool.


B2B CRITICAL SUCCESS FACTORS


B2B ALLIANCE AND RELATIONSHIP MANAGEMENT


TRUST IN B2B PARTNERING


**E-PROCUREMENT**


**AGENTS IN B2B EC**


Maamar et al. (2004) present a three-level specification approach for an environment of software agents and Web Services, and Wagner et al. (2003) design agents that enable dynamic distributed supply chain management.


**ELECTRONIC DATA INTERCHANGE (EDI) FOR B2B EC**


WEB SERVICES IN EC

Hündling and Weske (2003) describe the foundation and composition of Web Services with the Service Oriented Architecture, and Fensel and Bussler (2002) propose a Web Service Modeling Framework (WSMF) to provide the appropriate conceptual model for developing and describing Web Services and their composition. Huang and Chung (2003) propose a service composition framework that can support a Web-Services–based approach for the development of a variety of business integration solutions.


REFERENCES


Azoulay–Schwartz, R., S. Kraus, and J. Wilkenfeld, “Exploitation Versus Exploration: Choosing a Supplier in an Environment
Appendix A: Current Electronic Commerce Research


Kauffman, R. J., and H. Mohtadi, “Proprietary and Open Systems Adoption in E-Procurement: A Risk-Augmented


Appendix A: Current Electronic Commerce Research
Appendix A: Current Electronic Commerce Research


B2B MARKETPLACES


B2B INTERMEDIARY

EVALUATION OF B2B eMARKETPLACES

REFERENCES
CHAPTER 7. E-SUPPLY CHAINS, COLLABORATIVE COMMERCE, AND CORPORATE PORTALS

OVERVIEW OF SUPPLY CHAIN MANAGEMENT


Subramani (2004) explains the suppliers’ benefits of using IT in supply chain from the perspective of supplier-exploitation and exploration, and Rahman (2003) describes revolutionizing Internet-based supply chain management. Krishnan et al. (2004) discuss coordinating contracts for decentralized supply chains with retailer promotional efforts, and Bish et al. (2005) show that the flexible capacity can be very effective to hedge against forecast error in a make-to-order environment.

Pant et al. (2003) set forward a framework that captures various approaches to supply chain implementation for different supply chain requirements, and Swaminathan and Tayur (2003) discuss the importance of visibility, supplier relationships, distribution and pricing, customization, and real-time decision technologies raised with e-business. Folinas et al. (2004) examine the “e-volution” of supply chain cases and best practices.


PERFORMANCE OF SCM


DESIGN AND TECHNOLOGIES FOR SCM


INFORMATION SHARING FOR SCM


Corbett et al. (2004) study designing supply contracts based on the issues of contract types and information asymmetry, and Huang and Gangopadhyay (2004) measure the impact of information sharing by simulating supply chain management.

B2B INTEGRATION WITH ERP


COLLABORATIVE COMMERCE


GROUPWARE IN COLLABORATIVE COMMERCE

There are few groupware studies that have specifically focused on the application of supply chains. However, the groupware environment can be used to examine coordination in supply chain management. Fjermestad and Hilts (2000) present 54 cases and field studies on Group Support Systems from 79 published articles, and Downing and Clark (1999) evaluate the expected and realized usage of groupware at 22 consulting firms. Huang et al. (2003) present an empirical investigation of the effect of supporting virtual team building with a GSS, and Reinig and Shin (2002) examine the dynamic effects of group support systems on group meetings.

Dennis and Wixom (2002) present findings from an experimental evaluation of the effects of five moderators—task, tool, type of group, size of group, and facilitation. Trauth and Jessup (2000) study whether interpretive techniques can enhance the understanding of computer-mediated discussions, and Gopal and Prasad (2000) investigate why the GDSS study results are inconsistent. Blanning and Reinig (2002) apply GSS to the multiperiod scenario development to the future of Hong Kong.

INTERORGANIZATIONAL WORKFLOW


loosely coupled interorganizational workflow to model the workflows crossing organizational boundaries. Tan and Harker (1999) compare designing workflow coordination in centralized mechanisms with market-based mechanisms.


**INTRANET AND CORPORATE PORTAL**


**REFERENCES**


Raghunathan, S., and A. B. Yeh, “Beyond EDI: Impact of Continuous Replenishment Program (CRP) Between a
CHAPTER 8. INNOVATIVE EC SYSTEMS: FROM E-GOVERNMENT AND E-LEARNING TO CONSUMER-TO-CONSUMER COMMERCE

E-GOVERNMENT


of e-government services, and Montagna (2005) presents a framework for the assessment and analysis of e-government proposal.


E-government cases are studied in a number of different contexts: Singapore government’s e-procurement system (Devadoss et al. 2002), the European Union (Strejcek and Theil 2002), the European perspective toward online one-stop government (Wimmer 2002), and electronic service delivery in Hong Kong (Poon and Huang 2002).

**E-Democracy and Internet Voting**


**E-Learning**

Evans and Haase (2001) study the potential target markets for online business education, and articles analyze the future of the e-learning community (Bruckman 2002) and the consequence of e-learning (Emurian 2001). Zhang et al. (2004) and Erickson and Siau (2003) demonstrate that Internet and multimedia technologies are reshaping the way knowledge is delivered.

DeSanctis et al. (2001) present research on the global learning community with managers from 26 countries, and Piccoli and Ives (2001) assess the effectiveness of a Web-based virtual learning environment in basic IT skills training. Folkers (2005) examines the challenges to higher education by the emergence of online education, and Schell (2004) explores how universities marginalize the value of developing and delivering online courses.

Lin and Lin (2001) propose a conceptual model for virtual organizational learning, and Bhatt and Zaveri (2002) examine the learning strategies employed by organizations and DSSs, using the framework to demonstrate how a DSS can enhance organizational learning.


**E-Learning Systems**


**Knowledge Management in EC**


Singh et al. (2003) adopt Web Services for knowledge management in e-marketplaces, and Yoon et al. (2005) adopt agent technology for company knowledge management.

### P2P Computing


### References


CHAPTER 9. MOBILE COMPUTING AND COMMERCE AND PERSUASIVE COMPUTING

Although there are some minor differences in the definitions of mobile Internet, pervasive computing, and ubiquitous computing, these terms can be regarded as synonymous here.

M-COMMERCE AND UBIQUITOUS COMPUTING


Chae et al. (2002) study a theoretical model for information quality of mobile Internet services and support it with empirical validation, and Coursaris and Hassanein (2002) describe m-commerce from the consumer-centric perspective. Bell and Gemmell (2002) propose a Home Media Network as a single IP network within the home that connects externally to the Internet, telephone, and cable TV network.


Jarvenpaa et al. (2003) survey the value of m-commerce, and Kavassalis et al. (2003) discuss mobile marketing. Roussos et al. (2003) explain how mobile identity management is used to identify, acquire, access, and pay for services, and Tarasewich (2003) discusses the issue of designing mobile commerce applications.

ADOPATION OF M-COMMERCE


M-COMMERCE APPLICATIONS AND M-PAYMENT


Herzberg (2003) describes payments and banking with mobile personal devices, and Ogawara et al. (2002) examine the experience in Japan to conclude that m-commerce is viewed as the future vehicle of e-payment. Kreyer et al. (2003) propose the scope and characteristics of mobile payment procedures.


M-COMMERCE TECHNOLOGIES

Chan et al. (2002) study the usability of m-commerce across three platforms: WAP-enabled mobile phone, Palm OS-based wireless PDA, and pocket PCs running Windows CE operating systems. Raisinghani (2001) reviews Wireless Application Protocol (WAP) applications as a transitional technology of m-commerce, and Wen and Gyires (2002) examine the impact of WAP on m-commerce security. Barnes (2002b) takes a strategic perspective in reviewing the provision of services via the WAP, and Bertele et al. (2002) empirically study performance of the B2C WAP application in Italy. Hung et al. (2003) present the critical factors associated with the adoption of WAP services in mobile commerce in Taiwan.


Lee and Benbasat (2003) propose an environment called E-CWE that helps the design and development of m-commerce, and Jaar and Jorgensen (2003) analyze the security hole in WAP. Barnes and Huff (2003) explain Japan’s wireless Internet experience with the iMode platform.

SOFTWARE AND SOFTWARE AGENTS FOR UBIQUITOUS COMPUTING

Banavar and Bernstein (2002) characterize the software infrastructure and design challenges for ubiquitous computing application, and Pancake (2001) envisions the ubiquitous beauty of user-aware software. Maamar (2002) presents an m-commerce environment that is designed to perform using software agents, and Guan at al. (2002) introduce an intelligent product-brokering agent for m-commerce applications that considers user preference.


SOCIAL ISSUES IN UBIQUITOUS COMPUTING


REFERENCES

Appendix A: Current Electronic Commerce Research


CHAPTER 10. DYNAMIC TRADING: E-AUCTIONS, BARTERING, AND NEGOTIATIONS

E-AUCTION AS NEGOTIATION AND DYNAMIC PRICING

Teich et al. (2001) explain that electronic auctions are designed as combining aspects of negotiations and auctions, and Strobel (2000) discusses how the Internet auction is regarded as the negotiation paradigm of electronic markets. Benyoucef et al. (2001) review the concepts and architectures of negotiation and how combinations of them are attempted in EC. Pinker et al. (2003) analyze current business and research issues in managing online auctions.


DESIGN OF AUCTION MECHANISMS


Chen et al. (2005) outline a decentralized mechanism design for supply chain organizations using an auction market. Cai and Wurman (2005) model sequential, multiunit, sealed bid auctions as a sequential game with imperfect
and incomplete information, and Babaioff and Walsh (2005) design an auction mechanism that is incentive-compatible, budget-balanced, yet highly efficient for supply chain formation.

Bapna (2002) studies the optimal design of the online auction channel with analytical, empirical, and computational insights. Fontoura et al. (2005) propose a flexible architecture of decentralized P2P auction, and He (2004) constructs a topology model based only on operational data without any expert knowledge of the specific auction market.

Strobel (2001) demonstrates the importance of designing roles and protocols of electronic negotiations to better organize the negotiation. Terwiesch et al. (2005) present a formal model of online haggling for a name-your-own-price retailer and buyers, and Tallroth (2004) proposes continuous trading in thin private value markets through a multiple-quote double auction.

SOFTWARE AGENTS FOR AUCTION SYSTEMS

Gregg and Walczak (2003) review the existing agent technologies with regard to their effect on online auctions. Liu et al. (2000) discuss the case where a real-time multi-auction is supported by a software agent, and Chkaiban and Sonderby (2000) propose the auction agent transfer protocol. Sandholm (1999) describes automated negotiation that is supported by software agents, and Lin and Chang (2001) propose a multiagent framework for automated online bargaining. Lee et al. (2000) propose a time-bound negotiation framework for EC agents, and Joshi et al. (2004) present a design for an event-trigger rule-based auction system called Intellibid.

Kehagias et al. (2005) design pricing mechanisms for autonomous agents whose bids are based on bid-forecasting, and Stone and Greenwald (2005) summarize the bidding algorithms developed for the online trading agent competition held in July 2000 in Boston. Dumas et al. (2005) develop probabilistic automated bidding in multiple auctions, and Roberts and Koumpis (2005) use ontologies to support the Situation Room Analysis as an auction engine for corporate information and knowledge exchange.

Vulkan and Preist (2003) present a design for automated double auction trading in agent-based markets for communication bandwidth, and Engelbrecht-Wiggans and Kahn (2005) argue for low revenue equilibriums in simultaneous ascending auctions. Gerber et al. (2003) discuss supply Web coordination by an agent-based trading network with integrated logistic services, which is called CASA.

PERFORMANCE OF AUCTIONS


APPLICATION OF AUCTIONS

Wang et al. (2002) study the online auction sites in Taiwan in terms of products, auction rules, and trading types, and Zimmerman et al. (1999) propose a Web-based platform for experimental investigation of an electric power auction.

For the management of grid and network computing architecture, Bhargava and Sundaresan (2004) propose a contingent bid auction to manage availability, commitment, and pricing, and Aflēche and Mendelson (2004) devise a general structure that augments pricing and priority auction in the queuing system.


COMPLEX AUCTIONS

Sandholm (2000) presents a winner determination method designed for combinatorial auctions, and Pekeč and Rothkopf (2003) discuss the design of combinatorial auctions from the perspective of computational complexity of winner determination and cooperation among competitors. Oso et al. (2003) propose an algorithm to reduce the computational complexity of winner determination for a combinatorial ascending auction where the bidding agents could place a bid for a combination of items at an arbitrary time via the Internet.

Kelly (2000) proposes a combinatorial auction procedure with multiple winners, named PAUSE, for the assignment of universal service, and Sandholm et al. (2005) propose a fast optimal algorithm for winner determination of combinatorial auction, named CABOB, and compares it with the CPLEX algorithm.

Teich et al. (1999b) design an algorithm for a multi-unit auction for Web implementation and Kothari et al. (2005) present an approximately efficient and approximately strategy-proof auction mechanism for a single-good multiunit allocation problem. Iwasaki et al. (2005) present a robust open ascending-price multiunit auction protocol for use against fictitious name bids, and Häkämies et al. (2003) compare the traditional English clock auction with the Web-based auction in a multiple unit environment. Teich et al. (1999a) develop simple multiple-issue algorithms and heuristics for the electronic auction.


BIDDER BEHAVIOR


Carr (2003) discusses how the costly bid evaluation is regarded as a factor in an unsuccessful bid, and Snir and Hitt (2003) present and analyze a theoretical model of costly bidding in online markets for software development services. Reeves et al. (2005) explore bidding strategies for market-based scheduling with the case of separate, simultaneous markets for individual time slots, and Bapna et al. (2003) demonstrate a simulation platform to replicate online Yankee auctions and analyze auctioneers’ and bidders’ strategies.

Burmeister et al. (2004) apply the notion of uncoercibility, which was introduced in e-voting systems to deal with the coercion of voters, to e-bidding games, and Kitts and Leblanc (2004) use pay-per-click auctions to sell positions in a search engine, with a trading agent designed to create a look-ahead plan of its desired bids. Ding et al. (2005) use an experiment to study and analyze emotional bidders’ behavior in a Priceline-like reverse auction.


Elmaghraby (2003) highlights the importance of ordering in sequential auctions, and Cliff (2003) uses a genetic algorithm to find optimal parameter values for trading agents that operate in virtual online auctions.

SECURITY IN E-AUCTIONS

Liao and Hwang (2001) propose a fair and privacy-preserved protocol for sealed-bid auctions, and Wang et al. (2001) propose a designing mechanism for e-commerce security with an example from sealed-bid auctions. Ba et al. (2003) present a cryptographic protocol with a semistrusted auctioneer that satisfies various requirements of fairness and privacy.
REFERENCES


CHAPTER 11. E-COMMERCE SECURITY

IMPERATIVES OF EC SECURITY AND METHODOLOGIES


EC SECURITY DESIGN


PUBLIC KEY INFRASTRUCTURE AND DIGITAL SIGNATURES


AUTHENTICATION AND DIGITAL CERTIFICATES


INTRUSION DETECTION AND FIREWALLS
Goan (1999) surveys the field of intrusion detection systems and describes an approach, and Durst et al. (1999) test and evaluate computer intrusion detection systems. Cavusoglu et al. (2005) assess the value of intrusion detection systems in IT security architecture, and Essmayr et al. (2004) present a security mechanism using role-based access control.


TRUST AND SECURITY
Klang (2001) elaborates on trust in international trade, and Ruppel et al. (2003) examines the role of trust and security in different types of EC relationships. Suh and Han (2003) survey the impact of customer trust and perception of security control on the acceptance of EC by Internet bank users.

REFERENCES


CHAPTER 12. ELECTRONIC PAYMENT SYSTEMS

E-PAYMENT SYSTEMS


For mobile payment systems, see Chapter 9.

MICROPAYMENTS


SMART CARD IN E-PAYMENTS


REFERENCES


CHAPTER 13. ORDER FULFILLMENT, eCRM, AND OTHER SUPPORT SERVICES

ORDER FULFILLMENT FOR EC

Choi, et al. (2004) present a design for an agent that can select the optimal order set in the e-marketplace, and Tang et al. (2004) discuss a framework and methodologies about dispute handling in e-commerce transactions.

APPLICATION SERVICE PROVIDERS

Although ASPs are not a unique issue in EC, many EC systems are implemented using an outside ASP platform. Therefore, the literature on ASPs can be useful for EC implementation. Dewire (2000) describes the benefit of an ASP, and Susarla et al. (2003) analyze satisfaction with ASP services through an empirical analysis. To evaluate the role of application service, Curric and Selitskas (2001) explore the supply side of IT outsourcing, and Chiou (2004) surveys the antecedents of consumer loyalty toward Internet service providers.


CONTENT MANAGEMENT


Manvi and Venkataram (2005) simulate the benefit of intelligent product information presentation in e-commerce, and Mohanty and Bhasker (2005) use a fuzzy approach to classify products in the Internet business.


SEARCH ENGINES AND PORTALS


CUSTOMER RELATIONSHIP MANAGEMENT IN EC


Du Plessis and Boon (2004) use a South African case study to discuss the importance of knowledge management in e-business and CRM, and Romano and Fjermestad (2001) investigate the status and maturity of eCRM through an exhaustive literature review of 369 articles. Schoder and Madeja (2004) present an empirical analysis on whether CRM is a critical success factor in EC, especially for B2C and small companies.


DATA MINING IN CRM AND PERSONALIZATION


Zeng et al. (2004) propose similarity measures and instance selection for collaborative filtering, and Schilke et al. (2004) propose an approach to allow multidimensional personalization for location and interest-based recommendations. Srikumar and Bhasker (2004) demonstrate that the Internet can use the customer’s past profile to support product selection and offer product variants as recommendations, and Kumar et al. (2004) examine user interface features that influence overall ease of use and personalization.

OUTSOURCING EC SUPPORT SERVICES

Because outsourcing EC system development and maintenance can be regarded as part of IT outsourcing, this review describes the research on IT outsourcing.


Ho et al. (2003) explore the persistence of managerial expectations in an IT outsourcing context where the traditional relationship between supervisor and subordinate changes to one of client-manager and contractor, and Choudhury and Sabherwal (2003) examine the evolution of portfolios of controls over the duration of outsourced information system development projects.

Lee et al. (2004b) compare IT sourcing strategies and test whether the configurational approach is superior to universalistic and contingency perspectives in explaining outsourcing success, and Khalifa (2004) studies information security considerations in IS/IT outsourcing projects based on a case study of two sectors.

Outsourcing policies are studied for many contexts: the reasons for IS outsourcing in the largest Spanish firms (Gonzalez et al. 2005); risk management practices in IS outsourcing by the commercial banks in Nigeria (Adeleye et al. 2004). Lorence and Spink (2004) survey the outsourcing status of health-care information systems for 16,000 health-care information managers in the United States and find that six factors influence a manager's decision: improved patient care, cost saving, regulations, competition, trained staff availability, and space considerations. Tas and Sunder (2004) describe financial service business process outsourcing, emphasizing the importance of training to ensure that service agents are capable and motivated.

Offshore outsourcing is another challenging issue. A SWOT analysis is applied to offshore outsourcing to India (Nair and Prasad 2004); offshore outsourcing of software development is evaluated at a country level in the Ukraine (Zatolyuk and Allgood 2004); cross-cultural issues for successful implementation of global software outsourcing are discussed (Krishna et al. 2004); and key issues for global IT sourcing are identified at the country level and individual level (Rao 2004).

REFERENCES


Gonzalez, R., J. Gasco, and J. Llopis, “Information Systems Outsourcing Reasons in the Largest Spanish Firms,”


CHAPTER 14. E-COMMERCE STRATEGY AND GLOBAL EC

CRITICAL SUCCESS FACTORS OF EC


Appendix A: Current Electronic Commerce Research

STRATEGIES FOR EC APPLICATIONS


Boyd and Bilegan (2003) trace the history of revenue management in the airline industry in an effort to illustrate a successful e-commerce model of dynamic and automated sales, and Blount et al. (2005) study the impact of human resource management on e-commerce using the cases of two retail banks in Australia.

Assessment of EC and the Balanced Scorecard


Hasan and Tibbits (2000) and Martinsons et al. (1999) use the balanced scorecard (BSC) as a foundation for the strategic management of information systems. Van der Zee and de Jong (1999) and Solano et al. (2003) argue that system quality can be integrated into the BSC, and Kim et al. (2003) evaluate CRM using the BSC scheme. Park et al. (2005) expand the BSC to incorporate the effect of supply chain management.

EC TECHNOLOGY ADOPTION


GLOBAL EC

facing global EC, and Gibbs et al. (2003) compare the environmental and policy factors shaping global EC diffusion using cases from 10 countries. Pavlou and Chai (2002) apply the theory of planned behavior to empirically investigate what drives EC across cultures.


NATIONAL STUDY ON EC

A number of articles address issues in the local context: adaptation of e-commerce in Brazil (Tigre and Dedrick 2004); e-business adoption of an SME in a Swedish Network (Ihlstrom and Nilsson 2003); e-business adoption by European firms (Zhu et al. 2003); adoption of e-commerce in Pakistan for small and medium enterprises (Seyal et al. 2004); and Internet appreciation by Nigerian business organizations (Osuagwu 2003).


SMALL AND MEDIUM ENTERPRISES IN EC


Ihlstrom and Nilsson (2003) use a Swedish industry to study the prerequisites and attitudes of SMEs, and Beck et al. (2005) examine diffusion and the efficient use of e-commerce among SMEs in three sectors—manufacturing, retail/wholesales, and banking/insurance—in Denmark, France, Germany, and the United States. Gribbins and King (2004) study electronic retailing strategies with the case of SMEs in the gifts and collectibles industry, and Buhalis and Deimezi (2003) provide examples of e-commerce developments in Greek SMEs.

REFERENCES


Appendix A: Current Electronic Commerce Research


CHAPTER 15. ECONOMICS AND JUSTIFICATION OF ELECTRONIC COMMERCE

In 2001, Kauffman and Walden (2001) surveyed the research on EC from the perspective of economic analysis. This appendix lists a vast number of their references. They suggested the direction of research for each category and associate each category with the necessary information technology and relevant economic theories. They classified the EC research as follows (and mentioned previously).

1. **Technology Issues**
   1. Internet Access Pricing
   2. Intelligent Agents in EC
   3. Search Costs and Tools
   4. Definition of EC Standards
2. **Product Issues**
   1. Pricing of Digital Products
   2. Characteristics of Internet Products
Appendix A: Current Electronic Commerce Research

3. Bundling, Sharing, and Differentiation
4. Adoption and Network Externalities

3. Business Process
1. Electronic Data Interchange
2. Government and the Location of Transactions
3. Valuation of EC Technology Investments
4. EC Business Models

4. Market Issues
1. Intermediation
2. Physical and Electronic Markets
3. Electronic Auctions
4. Network Externalities and Market Efficiency
5. Design of Electronic Markets
6. Trust

5. Macroeconomic Issues
1. Measurement of Digital Economy
2. Electronic Labor Markets
3. Electronic Money
4. Taxation and Regulation of EC
5. Economic Transformation
6. Electronic Government
7. International EC

COST-BENEFIT ANALYSIS FOR E-BUSINESS

There are few studies conducted under the title of cost-benefit metrics of e-commerce because the scope of e-commerce is partitioned into various specialties. For instance, Chapter 3 describes the references on performance in electronic retailing, and Chapter 7 describes the performance of SCM. So it is recommended that the reader refer to each topic of e-commerce to identify its performance metrics.


EFFECTIVENESS OF IT INVESTMENT

Since there is insufficient literature directly on the effectiveness of e-commerce, this chapter reviews the literature published between September 2003 and August 2005 that relates more generally to the effectiveness of IT. The methods cited may be used for performance measurement of e-commerce investments.


For the justification of IT investment, Clemons and Gu (2003) discuss the importance of balancing the need for timely action and certainty before action, and Au and Kauffman (2003) examine rational expectations in IT adoption and investment. Thatcher and Pingry (2004b) analyze theoretical evidence of the business value of an IT investment with a duopoly model, and Thatcher and Pingry (2004a) use an economic model to formalize the complex relationships between IT investment, intermediary performance measures, and economic performance.

CHAPTER 16. LAUNCHING A SUCCESSFUL ONLINE BUSINESS AND EC PROJECTS

WEB SITE DESIGN


Liu et al. (2000) evaluate design quality for Fortune 1000 companies, and Bennett (2002) studies the use of curiosity-arousing Web sites for B2B Internet marketing. Lee and Benbasat (2003) study the effects of Web interface features on responses such as attention and memory, and Winter et al. (2003) suggest that Web sites should be considered “electronic storefronts” that create impressions of their sponsoring firms.

Nyssven and Pedersen (2004) look at the moderating effects of a customer’s Internet experience on the customer’s perception of company Web sites, and Seilheimer (2004) contrasts the productive development of
WEB SITE DEVELOPMENT

Stell and Paden (2002) study the issues in creating retail Web sites for different consumer shopping orientations, and Rogers and Rajkumar (1999) examine such issues in creating Web sites for the visually impaired. Ranganathan and Ganapathy (2002) present an empirical analysis based on 214 online shoppers of the effect of four key dimensions of B2C Web sites—information content, design, security, and privacy.

WEB SITE EVALUATION FACTORS AND METHODS
Kim et al. (2003) define six categories of Web site evaluation criteria—business function, corporate credibility, content reliability, Web site attractiveness, systematic structure, and navigation—and show that there are significant differences in the design of Web sites across different industry groups.


Schubert (2002) presents a tool named Extended Web Assessment Method (EWAM) that was created to evaluate EC applications from the customer’s viewpoint. Aladwani (2002) presents two tools that were developed for measuring the ease and usefulness of a transactional Web site. Barnes and Vidgen (2001) apply the WebQual method to evaluate online bookshops.

EMPIRICAL EVALUATION OF WEB SITES
Azzone et al. (2001) investigate key determinants leading a firm to develop a specific configuration for its Web site and to change it over time through an empirical analysis, then analyze the effect of country, industry, and market related factors. Simeon (1999) presents the attracting, informing, positioning, and delivering (AIPD) strategy to evaluate Web sites and applies it to Japanese and American online banks.

Johnson and Misic (1999) conduct a case study to show how benchmarking can be used to evaluate a Web site. Saeed et al. (2002) study the impact of Web site value and advertising on firm performance in the EC context, and Robbins and Stylianou (2001) study the effect of cultural difference in adopting Web sites to give insight for the deployment of global Web sites.

Young and Benamati (2000) study the difference in large U.S. firms’ Web sites, and Jones and Kayworth (2002) examine performance of Web sites. Alpar et al. (2001) present findings that special interest content generates more Web site traffic than general interest content.

USERS’ ATTITUDE ABOUT WEB SITES
Perkowitz and Etzioni (2000) study the effect of adaptive Web sites, and Manber et al. (2000) observe the experience with personalization on Yahoo! Hillier (2003) draws on evidence from the anthropological, worldview, and systems design literature to show how culture and context play a significant role in the way individuals perceive and approach their interaction with a multilingual e-commerce Web site. Hu et al. (2004) present an empirical study to verify the relationship between audience impressions and visual styles of B2C Web pages.

REFERENCES

CHAPTER 17. LEGAL, ETHICAL, AND COMPLIANCE ISSUES IN ELECTRONIC COMMERCE

FRAUD ON THE INTERNET

Baker (1999) examines the issue of fraud on the Internet and discusses three areas of significant potential for misleading and fraudulent practices, and Oates (2001) discusses the needs and challenges that can only be accomplished with the cooperation of private, public, and international sectors.

DelVecchio et al. (2002) explore consumers’ perceptions of online credit card theft, and Alfuraih et al. (2002) propose trusted e-mail to prevent credit card fraud in multimedia products. Smith (2005) discusses the necessity of accountability in an EDI system to prevent employee fraud.

INTELLECTUAL PROPERTY RIGHTS


Grosso (2000) analyzes the promise and problems of the No Electronic Theft Act and reviews risks in digital rights management. Mulligan (2003) discusses the phenomenon that the rules programmed into
electronics and computers undermine the fair use exceptions in U.S. copyright law. Kopp and Suter (2001) describe the consumer, public policy, and managerial issues associated with “fan sites” and “hate sites” and their use of trademarked and copyrighted materials on the World Wide Web.


E-TAXATION


FREEDOM OF SPEECH

Samuelson (2003) describes the trial court decision that trade secret lawsuits are categorically immune from the First Amendment to the U.S. Constitution and free speech scrutiny, and Hailperin (1999) outlines the debate between the Child Online Protection Act (COPA) promoters and American Civil Liberties Union from the free speech point of view. Panko and Beh (2002) identify the legal basis for monitoring pornography and sexual harassment.

ANONYMITY

Marx (1999) suggests seven types of identity knowledge and 13 procedural questions to guide the development and assessment of Internet policy regarding anonymity, and Froomkin (1999) discusses the legal issues of anonymity and pseudonymity. Kling et al. (1999) deliberate the policy on assessing anonymous communication on the Internet, and Teich et al. (1999) describe the results and recommendations of the American Association of the Advancement of Science on anonymous communication policies for the Internet.

To bridge the conflicting concern about privacy and desire to anonymous access to network, Claessens et al. (2003) propose a solution for revocable anonymous access to the Internet. Wayner (1999) summarizes technical solutions for producing anonymous communication on the Internet, and Reiter and Rubin (1999) develop the system Crowds, which enables anonymous Web transactions. Gabber et al. (1999) present a software, Lucent Personalized Web Assistant, designed to generate secure, consistent, and pseudonymous aliases for Web users.

ISSUES IN PRIVACY

Milne and Culnan (2004) study strategies for reducing online privacy risks based on a survey of 2,468 Internet users, and Malhotra et al. (2004) propose the construct, the scale, and a causal model to help explain the Internet user’s information privacy concerns. Berendt et al. (2005) survey stated preferences and actual behavior concerning privacy, finding that online users easily forget their privacy concerns.


Several articles identify key issues in Internet privacy (Clarke 1999, Dhillon and Moores 2001) and data privacy protection (Grupe et al. 2002). Turner and Dasgupta (2003) address users’ concerns, technology, and implications of privacy on the Web for business organizations and individuals. Phelps et al. (2001)


Kaufman et al. (2005) describe the Platform for Privacy Preferences (P3P), which was introduced by the WWW Consortium to allow sites to express policies in machine-readable form and to expose these policies to site visitors, and they propose the Social Contract Core. Lahlou et al. (2005) describe privacy and trust issues according to the European Privacy Design Guideline for the Invisible Computers.

Moores and Dhillon (2003) test the performance of privacy seals in e-commerce, and Moores (2005) studies the effect of privacy seals in e-commerce such as TRUSTe, CPA WebTrust, and BBBOnline.

**PROGRAMS FOR PRIVACY PROTECTION**

Benassi (1999) discusses the development of the privacy seal program TRUSTe, which activates government regulations when users claim privacy concerns. Luo (2002) studies trust production and privacy concerns on the Internet using the framework of relationship marketing and social exchange theory, and Thatcher and Clemons (2000) study the management of costs of informational privacy for the individual health insurance market.


**SOCIAL AND LEGAL ISSUES IN EC**


Sipior and Ward (2002) describe a strategic response to a broad spectrum of Internet abuse as the responsibility of a chief privacy officer (CPO). Brungs and Jamieson (2005) analyze the legal issues that impact computer forensics from the perspective of Australia, and Sipior et al. (2005) discuss the ethical and legal concerns over spyware. Pitkänen et al. (2003) assess legal challenges for the mobile Internet, and Sipior et al. (2004) describe the CAN-SPAM Act to deal with spam.

Jackson et al. (2004) argue that greater Internet use has no effect on psychological well-being and social involvement. Junglas and Watson (2004) analyze the effect of national culture on the structure and functionality of corporate Web sites by comparing such sites in the United States and Germany.

The journal *Information Society* presented a special issue on the digital divide (Vol. 19, No. 4, 2003), which included such topics as rural areas (Nicholas 2003) and developing countries (Warschauer 2003).

**VIRTUAL COMMUNITIES**


Bughin and Zeisser (2001) discuss the marketing potential of a virtual community, and Bughin and Hagel (2000) discuss the operational performance and business models of virtual communities.

Wang and Fesenmaier (2003) assess how motivation contributes to an online community empirically using the online travel community. Schubert and Ginsburg (2000) address the role of personalization in a
virtual community, and Castelfranchi and Tan (2002) look at trust and deception in a virtual community. Leimeister et al. (2005) study the factors that support trust in health-care communities.

**VIRTUAL COMMUNITY APPLICATIONS**


**VIRTUAL TEAMS**


Piccoli and Ives (2003) present the results of a longitudinal study of virtual teams and explore the role of behavior control on trust decline, and Jarvenpaa et al. (2004) explore theories of trust in global virtual teams. Halaris et al. (2003) describe an integrating system that supports the virtual consortia in the construction sector.

**REFERENCES**


Appendix A: Current Electronic Commerce Research


A.5 CONCLUDING REMARKS

This online appendix attempts to help readers find articles relating to their own interests by categorizing articles into topics and introducing the references for each topic. Based on the review of EC research, we found the following research trends:

1. Web Services, Semantic Web, Software Agents, and Ubiquitous Computing are the major technological drivers of the next generation platform for e-commerce.

2. Agent research is popular in many application areas such as e-marketplaces, purchase support, B2B, m-commerce, and e-auctions. However, it is not clear how far humans will allow agents to replace their roles. Therefore, studies on the real-world performance of agents and their scope of human adoption seem necessary to lead to the development of more useful agents.

3. A great deal of research has been done on trust in multiple contexts, such as consumer’s trust, security and trust, trust in B2B partnerships, and fraud regulation to enhance trust in EC transactions.

4. Research on identifying the critical success factors for various types of e-business models seems necessary. Interesting issues include development of evaluation metrics from the perspective of the balanced scorecard.

5. Pricing schemes for e-channels and studies on the comparative discount performance via e-channels need continued observation in various contexts of product types and demographics.

6. Computer scientists are actively investigating the development of complex auction schemes and experimental simulation of market mechanisms under the heading of Computational Economics. Experimental research needs to progress toward the study of empirical performance and the attitude of decision makers’ delegation to automated decision mechanisms.

7. The boundary between EC and information systems research is blurred in the topics of groupware, workflow, EDI, security, outsourcing policy, and development platforms and strategies.

8. The EC research boundary with management practice is also blurred in the study of consumer behavior, pricing, CRM, and SCM.

9. There are fewer academic publications than expected in the areas of Internet advertising, public B2B exchanges, and e-payment.

10. Connectivity to small enterprises is a common social barrier to high EC penetration, so it needs attention to encourage the diffusion of EC.

11. Privacy, digital rights management, and trust are primary policy issues that have generated a high number of academic publications.

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