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Special Issue

Editorial Introduction: Cultivating and Securing the Information Supply Chain*

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Editorial Introduction: Cultivating and Securing the Information Supply Chain

The information supply chain (ISC) is an information-centric view of physical and virtual supply chains where each entity adds value to the chain by providing the right information to the right entity at the right time in a secure manner. ISCs create value for the collaborating entities by gathering, organizing, selecting, synthesizing, and distributing information. The challenges to cultivating an ISC arise from both organizational and technological perspectives. Agility and flexibility in both internal and inter-organizational business processes are required to benefit from technology investments in ISCs. Innovations in information and decision modeling, real-time communication and coordination structures, information exchange standards, and active learning and “sense and respond” mechanisms are essential from a technology perspective. Additionally, security, reliability, and fault-tolerance requirements will continue to be challenging research issues.

The focus of the JAIS Special Issue — Cultivating and Securing the Information Supply Chain — is to present the latest innovations in knowledge, security, business processes, and technology available for the information supply chain. The special issue was intended to encourage submissions that address the development, analysis, and evaluation of innovative systems, models, and business processes pertaining to a broad range of topics and issues related to information supply chains.

The Call for Papers reflected the need for IS researchers to engage the opportunities and challenges afforded by a new generation of technologies that are redefining the way inter-organizational relationships are managed. A number of topic areas such as workflow and data sharing standards, emergency preparedness and response, active conceptual modeling, sense and respond systems, mission critical decision-making, and information security were identified as being of particular interest to the special issue. Including relevant submissions solicited from the Fourth Annual CABIT Symposium and responses to the Call for Papers, we received more than 20 submissions. These manuscripts were put through a rigorous review process involving a number of reviewers actively working in this field. This process resulted in the acceptance of six quality papers that provide a good representational cross-section of current research on information supply chains. These papers make significant contributions to the ISC research stream by focusing on development of novel techniques, cases, and empirical approaches for better understanding of issues related to ISC.

The lead paper by Fang et al. (Collective Outsourcing to Market (COM): A Market-based Framework for Information Supply Chain Outsourcing) takes the traditional information flow problem in a retail supply chain and presents an innovative way of addressing the incentive problem for information sharing. Fang et al. propose two types of markets: (1) a market based on a publicly traded macro index, and (2) a betting market intended to extract private information from heterogeneous retailers. The index-based market performs best when there are a large number of traders (i.e., supply chain partners). Its forecast accuracy is better than individual forecasts in the supply chain. More interestingly, outside information can be integrated into the ISC to increase the overall efficiency. The betting market can operate in markets with a lower number of participants. The paper provides specific guidelines on the incentive structures needed in such bettors' markets. Interestingly, these types of prediction markets are increasingly becoming popular in other fields as well. Examples of such markets include the Hollywood Stock Exchange, Iowa Electronic Markets, and Hedgestreet. The article shows a promising avenue for further research in the IS field on how such markets can solve information sharing concerns in supply chains.

The article by Legner and Schemm continues the investigations into the operations of retail supply chains (Toward the Inter-organizational Product Information Supply Chain – Evidence from the Retail and Consumer Goods Industries). This paper focuses on the information coordination problems related to contextual information sharing requirements such as product descriptions. Unlike transactional information flow, contextual information flow problems arise due to inconsistencies in interpretation among partner organizations. While there is an ample body of literature on transactional information sharing, this paper fills the gap in the literature on the understanding of contextual information coordination in supply chains. Using two case studies as the underlying context, Legner and Schemm highlight the lack of coordination in the inter-organizational product information supply chain.

Sutton et al. (Risk analysis in Extended Enterprise Environments: Identification of Critical Risk Factors in B2B E-commerce Relationships) continue the theme of information coordination-related concerns by addressing the perceived enterprise risks inherent in supply chains. The authors identify several critical risk factors along the dimensions of technical, application-user, and business risk. Using respondents from the Institute of Internal Auditors Research Foundation (IIARF), the study tests the interrelationships between the three risk dimensions. The authors empirically show that technical risk is the foundational risk dimension that affects application user and business risk dimensions.

The next three papers in the special issue tackle interesting design science-oriented ISC problems. Roussinov and Chau (Combining Information Seeking Services into a Meta Supply Chain of Facts) view the World Wide Web as an information network and build a meta fact seeking service that integrates results from several different fact-oriented search engines. The article presents the architecture of the prototype meta search engine and empirically investigates its effectiveness. Using a question set from the 2004 annual Text Retrieval Conference (TREC), the authors demonstrate that the meta engine performed better than individual services. Additionally, tests show that the meta-engine performance is resilient to the exclusion of one of the underlying fact seeking search sites. The utility of such a system is significant in search tasks that require highly precise answers in a short amount of time.

Chen et al. (Emergency Response Information System Interoperability: Development of Chemical Incident Response Data Model) tackle the brittleness of information supply chains in the context of emergency response systems. A key observation in this work is that the lack of consistent data standards in emergency response hampers interoperability and information exchange in an ISC. Using Activity Theory as a building block, the authors develop an XML data model using processes common in standards development. The proposed data model extends the National Information Exchange Model (NIEM) and proactively addresses key issues in emergency response systems. Using a chemical incident response as an exemplar, the authors offer validation of their approach via a case illustration. The authors also provide the readers a good summary of the national efforts related to emergency management to help understand their contributions in a broader context.

D'Aubeterre et al. (A Semantic Approach to Secure Collaborative Inter-Organizational eBusiness Processes) address the semantic conflicts and lack of security knowledge in inter-organizational collaborative processes. The authors identify the meta-requirements for secure collaborations to cover representation of explicit knowledge, workflow models, resources, and role-based access restrictions. To evaluate the applicability of the semantic model, it is applied to model the Collaborative Planning, Forecasting and Replenishment (CPFR) process in a Fortune 100 organization. The meta-requirements laid out in this research are a very good foundation for designing the information exchange processes in ISCs.

In summary, the special issue papers address interesting and relevant issues related to information supply chains. We believe that these issues are only the beginning of a dynamic and vibrant research area that will continue to evolve in the coming years. It has been a privilege to guest edit this special issue and to be involved in the intellectual endeavors of researchers at the forefront of these efforts. We especially thank Professor Kalle Lyytinen, Editor-in-chief of Journal of the Association for Information Systems, for giving us this opportunity and thank all the reviewers for their diligent effort in ensuring the quality of the papers. We thank all the authors for contributing their work to the special issue and bearing with us on some delays in the review process. We hope the readers share our enthusiasm for the papers published in this issue and for their relevance in advancing novel innovations in information supply chains research.



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