International Conference on Cyber Transportation Logistics

A Global Value Chain for Services
Introduction

- significant changes in the supply of goods and services
- interplay between e-commerce, shipments and services
- Supply chain is also critical to delivering relief items to those dislocated by natural disasters
A 3-1/2 Year History

- faculty meetings at Fayetteville and Little Rock, Arkansas
- workshops with FedEx in Memphis, a Wal-Mart Distribution Center in Bentonville, AR, and Acxiom Corporation in Conway, AR
- reciprocal faculty visits between the University of Arkansas at Little Rock and the City University of Hong Kong
- Participation by ASTA and the National Science Foundation
- Visit to the RFID Lab at Fayetteville
- Conference on Cyber Transportation Logistics: A Global Value Chain for Services
Priorities

- E-commerce for Small and Medium Enterprises
- In-transit visibility technologies
- Information Quality in Entity and Identity Resolution
Information Technologies for Small and Medium Enterprises

- Less than 10 percent of SMEs use state incentive programs
- Knowledge-based service economy with automatic identification of merchandise
- One million vacancies in the manufacturing sector
- Some responsibility for supply chain logistics may rest on the shoulder of smes, in addition to the shippers
E-commerce core functions: 1993-2001 (Chu et al. 2007)
Identity Tracking Technologies

- RFID implementation is gradual due to issues in standards, security, privacy, and policy
- 25,000 wireless devices—a competing technology to RFID—are in place at 400 UPS sites
- Last-minute delivery or route changes via a truck's receiver
- Potential for disruption comes in many forms, from large-scale natural disasters and terrorist attacks to shipping ports being too small
- Role of the manufacturer, the shipper, vis-à-vis the carrier
An Instance of VTS

Information Quality in Entity & Identity Resolution

- Inconsistencies in data coding lead toward errors in goods delivery and tracking.
- Data network among the forty to fifty hit terminals in the world
- Acxiom, a long established data warehousing enterprise, would definitely be able to contribute well beyond their traditional role in market research
- The time for the “4th Party” in Cyber Transportation Logistics has come!
Current Paradigms

- 4th Party cyber logistics
- Supply-chain in an information-based environment
- Intelligent transportation systems
- E-commerce & economic/infrastructure management
Two Major Paradigms of SCM

- Three-stage view
  - Procurement, conversion, and distribution
- Three-flow view
  - Financial, information, and product flows
Programmatic Implications for Education

- Should there be a cross campus program on this subject?
- Are the existing course offerings by the participants sufficient to support this program?
- Where do the students come from?
Education Program Elements

- Computer Science and Computer Engineering
- Computer and Information Technology
- Information Quality
- Systems Engineering
- Engineering Technology
- Management
Research Implications

- Have we identified the salient technical issues?
- To whom is the research directed?
- Where is the funding source?
Participating Partner’s Research Contributions

- Development and applications of holonic manufacturing systems
- Location, Transport and Land-use: Modeling Spatial-Temporal Information
- Architecting RFID Middleware
- From Light Frequency Identification (LFID) to Radio Frequency Identification (RFID) in the Supply Chain
- The Boundaryless Enterprise: Information, Organization and Management
- An algebraic approach to data quality metrics for entity resolution over large datasets
Organizational Implications

- What do we call our coalition: A Laboratory or a Center?
- If it is a Center, should it be a Virtual Center?
- If it is a Laboratory, should it be a Virtual Laboratory?
Economic & Business-Development Implications

- What value does such a coalition add to the existing organization structures of the participating enterprises?
- What are the costs and benefits to the universities?
- What are the costs and benefits to the industries?
- What are the costs and benefits to the public sector?
Lee et al. (2007)
Emerging Paradigms?

- Evolution of e-commerce Web sites
- Operations management in the information economy
- Design of Product Recovery Networks under Uncertainty
- Mobile commerce integrated with RFID technology
- Access control in collaborative commerce
Mobile Commerce

Cases & Applications
- Location-based services
- Mobile advertising
- Mobile entertainment services and games
- Mobile financial applications
- Product locating and searching

Wireless Network Infrastructure
- Networking requirements
- Wireless and mobile network

Mobile Middleware
- Agent Technologies
- Database Management
- Security issues
- Wireless and mobile communication systems

Wireless User Infrastructure
- Mobile Interfaces
- Mobile handheld device

Mobile Commerce Theory and Research

Ngai & Gunasekaran (2007)
Questions?