ILLINOIS SANDBOX

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Engineering-Behavior Science-Industry Partnership

UIUC Behavior Science Team
- Social dynamics (Gray Swicegood, Diana Mincyte; Sociology)
- Social networks (Noshir Contractor; Speech Comm)
- Identity and behavior (Michael Pratt, Erik Dane, Kevin Rock; Commerce)
- Communication effectiveness and quantity estimation (Patrick Laughlin; Psychology)
- Business process and strategies (Michael Shaw, Michele Gribbins; Commerce)

UIUC Engineering Team
- Dynamic optimization (Wen-mei Hwu, ECE)
- e-Service Software Development (Shailesh Patel, Sain –Z.Ueng, Marie Conte)
- Project management (Liang Liu, CEE)
- Wireless networking (Campus IT staff)

UIUC Sandbox
- Product verification/validation
- System design/improvements
- New ideas/products/devices
- Hiring students
- Leveraged research
- Others

Industry Partners
- New design/devices/infrastructure
- Hardware/software components
- Ideas & people
Supporting Distributed Workplace

Use of distributed employees (e.g., teleworkers, virtual team members, satellite offices, mobile employees) is growing, but we have very little understanding of how to efficiently co-ordinate these workplaces:

• **29.7 MILLION** Americans employed by corporation frequently work at home (**22% OF THE LABOR FORCE**) (Gartner Group)

• **2.2 MILLION** small companies (<100 employees) offer telecommuting (**28.9%**) (International Data Corp.)

• Between 1997 – 1999, number of workers who spent at least some time working virtually **INCREASED NEARLY 100%** (*Work Week*, 1999)

• **51%** of North American companies and almost **2/3** of all Fortune 500 companies allow members to work virtually (Goldsberg, 2000)
Addressing the Productivity Paradox
E-Services

Distributed e-Services Initiative

• “Core Services” provided
• Promote development of e-services by students
• Develop technical flow and identify potential new Core Services
Core Services Examples

- Profiler: Keep track of user profiles
- Monetary exchange: Exchange rates, bank locations
- Physical location inquiries: Provide location information using sensors
- Mapping service: Directions, local maps. Can be coupled with physical location inquiries
- Schedule matching
- Instant messaging
- UDDI query refinement
Why EJB??

- Provides Enterprise-level services regardless of the scale.
- Eliminates system programming.
- Writing business logic as EJB components opens up new possibilities in developer productivity, application deployment, performance, reliability and resuability.
- EJB’s help create portable and scalable solutions.
Basic EJB Architecture

Components:
- EJB Server
- EJB Container
- Entity & Session Beans
- EJB Client
How will technologies reduce coordination costs in:

• On-Site Construction Project Coordination
• Childcare Scheduling
• Textbook Exchange
Coordination of Construction

Challenges: paper-based documentation, diverse databases, different computer systems, data/information exchange, security, time & geographical barriers
Coordination of Construction

**Users:** architects, engineers, consultants, contractors, manufacturers, and government agencies
Mobile Documentation and Collaboration for Construction Projects

Applications
• Virtual IT-based teams
• Real-time data exchange
• Digital documentation
• Wireless communications

Outcomes
• Information sharing, B2B
• Real-time data collection & access
• Proactive controls (trending prediction)
• Better decisions in problem solving
• Reduced travel
Childcare Services

Users

• Today in the US, 59% of mothers with children younger than 6 are in the labor force.

• 76% of mothers with children between the ages of 6 and 17 are in the labor force.

• Childcare centers, service providers
Childcare Services

Challenges
- Conflicts in schedules
- Lack of flexible short-notice services
- Geographically distributed users

Applications
- Mobile, wireless, handheld devices → immediate coordination, ubiquitous communication networks
- Secure services with access to user profiles

Outcomes
- Reduced costs
- Optimal communication
Textbook Exchange

Users

• Students
• Academic community

Challenges

• Flexibility to avoid bookstore hours
• Competitive prices

Applications

• A bulletin board on which students can post textbooks for sale
• Matches seller and buyer by book, by class, etc.
• No on-line monetary exchange
Textbook Exchange

Features

- Seller reviews
- Searches on the Library of Congress database
- Secure logins, leveraging BlueStem
- User Profiling
Textbook Exchange

Outcomes

• Anytime/anyone/anywhere/anything, no barriers of time/distance → “Information village”

• Reduction in coordination costs in terms of time and money
Summary

• Technology is useful to solve coordination paradox
• E-services is a medium that helps to reduce coordination cost for exchanging materials, information, and resources
• Three examples illustrate exchange in materials (construction), information (child care), resources (textbooks).