# The Role of Standards in the Creation and Use of Information Systems

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# Prior MIS Research

- Looked at
  - *MIS Quarterly*
  - *Information Systems Research*
  - *Journal of Management Information Systems*
  - *European Journal of Information Systems*
  - relevant articles from *Management Science*
- Total of 8 papers, 1996-2002

# MIS Standards Research

| Article | Journal | Phenomenon |
|---|---|---|
| Brynjolfsson & Kemerer | Mgt Sci 1996 | Spreadsheet product competition |
| Chau & Tam | MISQ 1997 | Open systems adoption |
| Kauffman et al | ISR 2000 | Bank ATM network adoption |
| West & Dedrick | ISR 2000 | PC standards competition |
| Damsgaard & Truex | EJIS 2000 | EDI adoption |
| Tam & Hui | JMIS 2001 | Mainframe vendor competition |
| Au & Kauffman | JMIS 2001 | Online billing adoption |
| Gallaugher & Wang | MISQ 2002 | Web server product competition |

| Article | Methodology | Theoretical Framework |
|---|---|---|
| Brynjolfsson & Kemerer | Hedonic price regression | Network effects |
| Chau & Tam | Logistic regression | Technology-organization-environment |
| Kauffman et al | Hazard model | Network effects |
| West & Dedrick | Case study | Network effects, product architectures |
| Damsgaard & Truex | Multiple case studies | Linguistic grammars |
| Tam & Hui | Regression | Network effects, Bass diffusion model |
| Au & Kauffman | Theoretical model | Network effects |
| Gallaugher & Wang | Hedonic price regression | Network effects, diffusion of innovations |

# Summary

Of 8 papers:

- 2 each in MISQ, ISR, JMIS
- 4 adoption of standards, 4 competition between standards
- 6 used network effects

Domain of workshop papers much broader

# Moving Forward

To create a standards community in MIS:

- Agree on the domain
  - With a “big tent” of subdomains
- Agree on terminology
- Agree (or not) on outcomes
- Agree to disagree

# What Does "Standard" Mean?

- Compatibility vs. reference (quality)
- Data interchange vs. process
- *De facto* vs. *de jure* (or quasi *de jure)*
- "Open" vs. "proprietary"
- Sponsored (owned) vs. unsponsored (shared)
- Specification vs. implementation

# Ways of Creating Standards

- Interorganizational vs. intraorganizational
- Within a firm vs. across firms (SDO)
- For one industry (vertical) or all
- User-driven vs. producer-driven
- Top down (intended) vs. bottom up (emergent)
- Multiway or pairwise

# What is "Standards Research"?

- Policy studies
  - Communications: standardization process
- Technical studies
  - Software engineering: standards content
  - Systems development: design prerequisite
  - Technology adoption: a technology attribute
- Economic studies
  - Network economics: software provision
  - IO economics: barrier to entry

# Relevant Outcomes

Among the possible outcomes:

- Creation/approval of formal standard
- Adoption
  - By I.T. vendors
  - By I.S. buyers/operators
  - By users of systems incorporating standards
    - Adoption vs. deployment vs. use
- Return to standardization investment
- Effect on industry structure

# Emerging Areas of Research

As represented by our conference

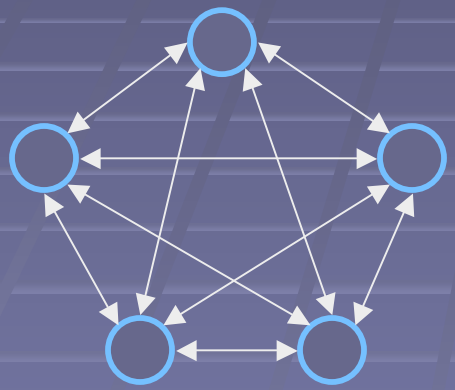
- Vertical (industry specific) standards
  - Or are they user-created standards?
- Web standards and standardization
  - This is not your father's SDO
- E-business — extension of EDI
  - Standardizing syntax is not enough

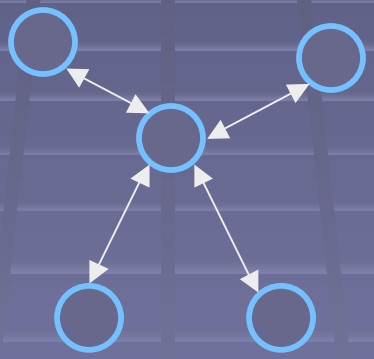
# Areas of Future Research

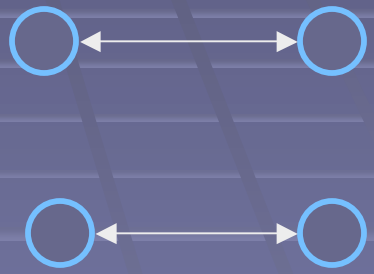
- Imperfect standards
- Dynamic standards
- Platform standards
- Value of standards
- Standards and industry structure
- Non-isotropic standards

# Topologies of Standardization

| Many-to-many | One-to-many | One-to-one |
|---|---|---|







Or “industrywide”, “unilateral”, “bilateral”
Origin: Damsgaard & Truex (2000): “market”, “hub and spoke”, “binary”

# Emulating "Best Practice"

Lessons from other emerging fields:

- Define what part of "standards" you're studying
- Reuse existing terminology
- Link back to prior work (outside and inside MIS)
- Articulate why standards are relevant to MIS
- Avoid fratricide: emphasize similarities, not differences
- Build a community