

Technology and Organizing

MTS 512

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Office Hours: TBD

Term: Spring 2008
Day and Time: Wed. 2-5 PM
Location: FSB 2-145

OVERVIEW

This Ph.D. seminar is designed to introduce students to fundamental questions and approaches to the study of technology and organizations. Specifically, we will explore how organizational structures enable and constrain the development of new technologies, and how new technologies enable changes in the process of organizing. The purpose of the course is to provide students with a thorough grounding in various theoretical perspectives on technology development and use. The readings are organized historically. The course is not intended for master's students. First year PhD students without any background in the behavioral sciences may want to wait until their second year before taking this course.

This seminar has two major purposes. One is to explore important, contemporary issues at the intersection of organization theory and technology studies from variety of theoretical, methodological, and topic-oriented perspectives. The second is to practice a variety of skills such as synthesizing research, understanding research designs, and developing research questions that should prove useful in your academic careers.

EXPECTATIONS

You will be evaluated on your class participation (70% of your grade) and on your written work (30% of your grade).

Readings

- This course has a very heaving reading load. On average, you will read five papers a week. One or two of the papers will be foundational – they played a significant role in formulating the perspective we are studying. Two of the papers provide an empirical elaboration of the perspective and one or two additional papers critique the perspective with new theoretical arguments or empirical research. All of the readings are available in PDF format on the course's blackboard website. For each perspective, I've included additional papers that you may want to find to learn more about the perspective. You are not required to read these papers for class. But I encourage you to do so. Because I expect you to read so much, I've reduced the writing requirements for this course.

Class Participation

- Analyze and be prepared to discuss the readings that are assigned for each class. All students should arrive at class with their analyses of the readings, ready to go. A good analysis means that you will think about the "big story" of the day as well as the details of the articles.

For the "big story," it may be helpful to ask yourself the following questions about the theoretical perspective under review (think about the readings as a collection):

1. What are the core research problems or questions addressed by the theory?
2. What is the typical metatheory (e.g., concepts, assumptions, evidence, methods, etc.) associated with this approach?
3. Can you specify the general theoretical arguments typically used in the approach?
4. What is the state of the evidence with respect to various theoretical claims?

For the details, it may be useful to ask yourself the following questions about each reading:

1. What are the central theoretical questions addressed?
 2. What primary mechanisms are posited?
 3. What is the evidence to support the argument(s)? How convincing is that evidence?
 4. What are the basic assumptions behind the analysis?
 5. How could this analysis be improved? Be specific and practical (do not make suggestions that you could not realistically envision yourself implementing)
- Twice during the quarter, you will be asked to present an empirical paper in the day's readings in conference-style. That is, present the key points of the paper in 15 minutes (firmly enforced), relying on the following flow of 8 power point slides:
 1. Literature background (note key points and citations),
 2. Continue #1 (if necessary)
 3. Research question(s), major hypotheses (presentation should note underlying arguments),
 4. Key aspects of the research design (research design, sample, data collection, construct measures, analytic techniques),
 5. Major results (e.g., regression table),
 6. Continue #5 (if necessary)
 7. Discussion points,
 8. Conclusions.

Keep in mind that your presentation should give the audience a few intriguing take-aways, impress the audience with the quality of your research, and stay on time.

Written Work

The course is organized into two parts. The first part (Weeks 2-5) focuses on theoretical approaches to technology development in organizations. The second part (Weeks 6-10) focuses on theoretical approaches to technology use in organizations. You are expected to write one paper at the conclusion of each part of the course. These papers should include the following:

1. A clear description of a problem (concerning the relationship between technology development or use and the process of organizing) you believe is important. You can choose an empirical problem that you have encountered in organizations in which you've worked or a theoretical problem within or across the perspectives we covered in class. Be sure to motivate your problem clearly for the reader. If the problem doesn't seem important, people won't believe your paper to be important either.
2. A solid discussion of how papers in each of the perspectives we read would deal with the problem you have outlined. Don't simply provide a review of each paper. Instead, get inside each perspective's way of thinking about the world. Would writers in that perspective think your problem was important? If so, why? If so, why not? Do some of the perspectives offer more tools (e.g. concepts, mechanism) than others for solving your problem? How could you integrate insights from the different perspectives to either define your problem in a new way or solve it?

Think of this paper as the theory section of an empirical article. Use your problem definition to either propose testable hypotheses (for deductive work) or to generate an interesting research question (for inductive work).

Each paper should be no more than 10 double spaced pages, excluding references. The paper about technology development is due on the day we meet for Week 6 and the paper about technology development is due exactly one week after our last day of class. Please submit your papers to me by email and turn a hard copy into me at my office or in my box in Frances Searle.

COURSE OUTLINE

Week 1: Course Introduction

I'll describe the course and its logistics, including why we will not cover certain topics within the realm of technology studies, including macro-level diffusion, innovation, CSCW, HCI, investment in IT, technology policy,. I'll detail the logic for the presentation of topics in the schedule, which reflects a refutation of the tenets of technological determinism and thus breaks down rather neatly into studies of development versus use.

Readings:

1. Bourgeois, L. J. (1984). Strategic management and determinism. *Academy of Management Review*, 9(4), 586-596.
2. Bimber, B. (1990). Karl Marx and the Three Faces of Technological Determinism. *Social Studies of Science*, 20(2), 333-351.
3. Wyatt, S. (2008). Technological Determinism is Dead: Long Live Technological Determinism. In E. Hackett, O. Amsterdamska, M. Lynch & J. Wajcman (Eds.), *New Handbook of Science, Technology and Society* (pp. 165-180). Cambridge, MA: MIT Press.

PART 1: TECHNOLOGY DEVELOPMENT

Week 2: Deskilling Theory

Formulation

1. Braverman, H. (1974). *Labor and monopoly capital: The Degradation of Work in the Twentieth Century*. New York: Monthly Review Books. (Chapters 9 and 10, pp. 184-248)

Elaboration

2. Noble, D. F. (1979). Social choice in machine design: The case of automatically controlled machine tools. In A. Zimbalist (Ed.), *Case studies on the labor process*. New York: Monthly Review Press.
3. Wallace, M., & Kalleberg, A. L. (1982). Industrial Transformation and the Decline of Craft: The Decomposition of Skill in the Printing Industry, 1931-1978. *American Sociological Review*, 47(3), 307-324.

Critique

4. Attewell, P. (1987). The deskilling controversy. *Work and Occupations*, 14(3), 322-346.
5. Zuboff, S. (1988). *In the age of the smart machine: The future of work and power*. New York: Basic Books. (Chapter 4, pp. 124-173 and Chapter 8, pp. 285-310)

Additional Readings (Not Required)

1. Barker, J., & Downing, H. (1980). Word processing and the transformation of patriarchal relations of control in the office. *Capital and class*, 10, 64-99.
2. Barley, S. R. (1988). Technology, power, and the social organization of work: Towards a pragmatic theory of skilling and deskilling. *Research in the Sociology of Organizations*, 6, 33-80.
3. Baron, J. N., & Bielby, W. T. (1982). Workers and Machines: Dimensions and Determinants of Technical Relations in the Workplace. *American Sociological Review*, 47(2), 175-188.
4. Form, W. (1987). On the degradation of skills. *Annual Review of Sociology*, 13, 29-47.
5. Littler, C. (1982). Deskilling and changing structures of control. In S. Wood (Ed.), *The degradation of work: Skill, deskilling and the labor process* (pp. 122-145). London: Hutchison.
6. Thomas, R. J. (1994). *What machines can't do: Politics and technology in the industrial enterprise*. Berkeley: University of California Press.

Week 3: Evolutionary Theory

Formulation

1. Nelson, R. R., & Winter, S. G. (1977). In Search of a Useful Theory of Innovation. *Research Policy*, 6(1), 36-76.

Elaboration

2. Dosi, G. (1982). Technological paradigms and technological trajectories. *Research Policy*, 11, 147-162.
3. Tushman, M. L., & Anderson, P. (1986). Technological discontinuities and organizational environments. *Administrative Science Quarterly*, 31, 439-465.

Critique

4. Henderson, R. M., & Clark, K. B. (1990). Architectural Innovation: The Reconfiguration of Existing Product Technologies and the Failure of Established Firms. *Administrative Science Quarterly*, 35(1), 9-30.
5. Dougherty, D. (1992). Interpretive Barriers to Successful Product Innovation in Large Firms. *Organization Science*, 3(2), 179-202.

Additional Readings (Not Required)

1. Ahuja, G. (2000). Collaboration networks, structural holes, and innovation: A longitudinal study. *Administrative Science Quarterly*, 45, 425-455.
2. Anderson, P., & Tushman, M. L. (1990). Technological discontinuities and dominant designs: A cyclical model of technological change. *Administrative Science Quarterly*, 35, 604-633.
3. Dosi, G., & Nelson, R. R. (1994). An introduction to evolutionary theories in economics. *Journal of Evolutionary Economics*, 4, 153-172.
4. Gatignon, H., Tushman, M. L., Smith, W., & Anderson, P. (2002). A structural approach to assessing innovation: construct development of innovation locus, type, and characteristics. *Management Science*, 48(9), 1103-1122.
5. Nelson, R. R., & Winter, S. G. (1982). *An evolutionary theory of economic change*. Cambridge, MA: Belknap Press.
6. Rosenkopf, L., & Tushman, M. L. (1994). The coevolution of technology and organization. In J. A. C. Baum & J. Singh (Eds.), *Evolutionary dynamics of organizations* (pp. 403-424). New York: Oxford University Press.
7. Sorenson, J. B., & Stuart, T. E. (2000). Aging, obsolescence, and organizational innovation. *Administrative Science Quarterly*, 45, 81-112.

Week 4: Social Construction of Technology

Formulation

1. Pinch, T. J., & Bijker, W. E. (1984). The social construction of facts and artifacts: Or how the sociology of science and the sociology of technology might benefit each other. *Social Studies of Science*, 14, 399-441.

Elaboration

2. Rosen, P. (1993). The social construction of mountain bikes: Technology and postmodernity in the cycle industry. *Social Studies of Science*, 23(3), 479-513.
3. Kline, R., & Pinch, T. J. (1996). Users as agents of technological change: The social construction of the automobile in the rural United States. *Technology and Culture*, 37(4), 763-795.

Critique

4. Winner, L. (1993). Upon opening the black box and finding it empty: Social constructivism and the philosophy of technology. *Science, Technology, & Human Values*, 18(3), 362-378.
5. Garud, R., & Rappa, M. A. (1994). A socio-cognitive model of technology evolution: The case of cochlear implants. *Organization Science*, 5(3), 344-362.

Additional Readings (Not Required)

1. Bijker, W. E. (1995). *Of bicycles, bakelites, and bulbs: Toward a theory of sociotechnical change*. Cambridge, MA: The MIT Press.
2. Klein, H. K., & Kleinman, D. L. (2002). The social construction of technology: Structural considerations. *Science, Technology, & Human Values*, 27(1), 28-52.
3. Kline, R. (2003). Resisting Consumer Technology in Rural America: The Telephone and Electrification. In N. Oudshoorn & T. Pinch (Eds.), *How Users Matter: The Co-construction of Users and Technology* (pp. 51-66). Cambridge, MA: MIT Press.
4. Oudshoorn, N., & Pinch, T. (Eds.). (2003). *How Users Matter: The Co-construction of Users and Technology*. Cambridge, MA: MIT Press.
5. Pinch, T. J. (1996). The social construction of technology: A review. In R. Fox (Ed.), *Technological change: Methods and themes in the history of technology* (pp. 17-35). Amsterdam: Harwood.
6. Rodgers, K. E. (1996). Multiple meanings of Alar after the scare: Implications for closure. *Science, Technology, & Human Values*, 21(2), 177-197.
7. Vaughan, D. (1999). The role of the organization in the production of techno-scientific knowledge. *Social Studies of Science*, 29(6), 913-943.

Week 5: Actor-Network Theory

Formulation:

1. Callon, M. (1980). The state and technical innovation: A case study of the electric vehicle in France. *Research Policy*, 9, 358-376.

Elaboration:

2. Latour, B. (1991). Technology is society made durable. In J. Law (Ed.), *A Sociology of Monsters: Essays on Power, Technology and Domination* (pp. 103-131). London: Routledge.
3. Akrich, M. (1992). The De-Description of Technical Objects. In W. E. Bijker & J. Law (Eds.), *Shaping Technology/ Building Society: Studies in Sociotechnical Change* (pp. 205-224). Cambridge, MA: MIT Press.

Critique:

4. Star, S. L. (1992). The Trojan door: Organizations, work, and the 'open Black Box'. *Systems Practice* (5), 395-410.
5. Collins, H. M. & Yearley, S. (1992). Epistemological Chicken. In A. Pickering (Ed.) *Science as Practice and Culture* (pp. 301-326). Chicago, Chicago University Press.

Additional Readings (Not Required)

1. Callon, M. (1986). Some elements of a sociology of translation: Domestication of the scallops and the fisherman of St. Brieuc Bay. In J. Law (Ed.), *Power, action, and belief: A new sociology of knowledge* (pp. 196-233). London: Routledge.
2. Holstrom, J., & Robey, D. (2005). Inscribing Organizational Change With Information Technology. In B. Czarniawka & T. Hernes (Eds.), *Actor-Network Theory and Organizing* (pp. 165-187). Malmo: Liber.
3. Latour, B. (1987). *Science in action: How to follow scientists and engineers through society*. Cambridge, MA: Harvard University Press.
4. Latour, B. (1999). On recalling ANT. In J. Law & J. Hassard (Eds.), *Actor network and after* (pp. 15-25). Oxford: Blackwell.
5. Latour, B. (2005). *Reassembling the Social: An introduction to Actor-Network Theory*. Oxford: Oxford University Press.
6. Law, J. (1987). Technology and heterogeneous engineering: The case of the Portuguese Expansion. In W. E. Bijker, T. P. Hughes & T. Pinch (Eds.), *The social construction of technological systems: New directions in the sociology and history of technology* (pp. 111-134). Cambridge, MA: MIT Press.
7. Law, J. (1992). Notes on the theory of the actor-network: ordering, strategy, and heterogeneity. *Systems Practice*, 5(4), 379-393.

PART 2: TECHNOLOGY USE

Week 6: Socio-Technical Systems Theory

Formulation:

1. Trist, E. L., & Bamforth, K. W. (1951). Some social and psychological consequences of the longwall method of coal-getting. *Human Relations*, 4(1), 3-38.

Elaboration:

2. Rice, A. K. (1953). Productivity and social organization in an Indian weaving shed: An examination of some aspects of the socio-technical system of an experimental automatic loom shed. *Human Relations*, 6(4), 297-329.
3. Cummings, T. G., & Srivastva, S. (1977). *Management of work: A socio-technical systems approach*. San Diego, CA: University Associates.

Critique:

4. Pasmore, W., Francis, C., Haldeman, J., & Shani, A. (1982). Sociotechnical systems: A North American reflection on empirical studies of the seventies. *Human Relations*, 33(12), 1179-1204.
5. Kaghan, W. N., & Bowker, G. C. (2001). Out of machine age?: Complexity, sociotechnical systems and actor network theory. *Journal of Engineering and Technology Management*, 18, 253-269.

Additional Readings (Not Required)

1. Barley, S. R. (1990). The alignment of technology and structure through roles and networks. *Administrative Science Quarterly*, 35(1), 61-103.
2. Cummings, T. G. (1978). Self-regulating work groups: A socio-technical synthesis. *Academy of Management Review*, 3(3), 625-634.
3. Denison, D. R. (1982). Sociotechnical design and self-managing work groups: The impact on control. *Journal of Occupational Behavior*, 3, 297-314.
4. Emery, F. (1959). *Characteristics of sociotechnical systems*. London: Tavistock Institute.
5. Fairhurst, G. T., Green, S., & Courtright, J. (1995). Inertia forces and the implementation of a socio-technical systems approach: A communication study. *Organization Science*, 6(2), 168-185.
6. Pasmore, W. (1988). *Designing effective organizations: The sociotechnical perspective*. New York: John Wiley & Sons.
7. Trist, E. L., Higgins, C., Murray, H., & Pollock, A. (1963). *Organizational choice*. London: Tavistock Institute.

Week 7: Contingency Theory

Formulation:

1. Woodward, J. (1958). *Management and technology*. London: HMSO.

Elaboration:

2. Perrow, C. (1967). A framework for the comparative analysis of organizations. *American Sociological Review*, 32, 194-208.
3. Hickson, D. J., Pugh, D. S., & Pheysey, D. C. (1969). Operations technology and organizational structure: An empirical reappraisal. *Administrative Science Quarterly*, 14(3), 378-397.

Critique:

4. Aldrich, H. E. (1972). Technology and organizational structure: A reexamination of the findings of the Aston group. *Administrative Science Quarterly*, 17(1), 26-43.
5. Barley, S. R. (1986). Technology as an occasion for structuring: Evidence from observations of CT scanners and the social order of radiology departments. *Administrative Science Quarterly*, 31(1), 78-108.

Additional Readings (Not Required)

1. Drazin, R., & Van de Ven, A. H. (1985). Alternative forms of fit in contingency theory. *Administrative Science Quarterly*, 30, 514-539.
2. Fry, L. W. (1982). Technology-structure research: Three critical issues. *Academy of Management Journal*, 25(3), 532-552.
3. Gerwin, D. (1981). Relationships between structure and technology. In P. C. Nystrom & W. H. Starbuck (Eds.), *Handbook of organizational design* (Vol. 2, pp. 3-38). New York: Oxford University Press.
4. Hunt, R. G. (1970). Technology and Organization. *Academy of Management Journal*, 13(3), 235-252.
5. Mohr, L. (1971). Organizational technology and organizational structure. *Administrative Science Quarterly*, 16, 444-459.
6. Thompson, J. D. (1967). *Organizations in action: Social science bases of administrative theory*. New York: McGraw-Hill.
7. Scott, W. R. (1990). Technology and structure: An organizational-level perspective. In P. S. Goodman, L. S. Sproull & Associates (Eds.), *Technology and organizations* (pp. 109-143). San Francisco: Jossey-Bass.

Week 8: Media Richness Theory

Formulation:

1. Daft, R. L., & Lengel, R. H. (1986). Organizational information requirements, media richness and structural design. *Management Science*, 32(5), 554-571.

Elaboration:

2. Rice, R. E. (1992). Task analyzability, use of new media and effectiveness: A multi-site exploration of media richness. *Organization Science*, 3(4), 475-500.
3. Carlson, J. R., & Zmud, R. W. (1999). Channel expansion theory and the experiential nature of media richness perceptions. *Academy of Management Journal*, 42(2), 153-170.

Critique:

4. Fulk, J. (1993). Social construction of communication technology. *Academy of Management Journal*, 36(5), 921-951.
5. Markus, M. L. (1994). Electronic mail as the medium of managerial choice. *Organization Science*, 5(4), 502-527.

Additional Readings (Not Required)

1. Carlson, P. J., & Davis, G. B. (1998). An investigation of media selection among directors and managers: From "self" to "other" orientation. *MIS Quarterly*, 22(3), 335-362.
2. Daft, R. L., & Lengel, R. H. (1984). Information richness: A new approach to managerial behavior and organization design. In L. L. Cummings & B. M. Staw (Eds.), *Research in organizational behavior* (Vol. 6, pp. 191-233). Homewood, IL: JAI Press.
3. Fulk, J., & Boyd, B. (1991). Emerging theories of communication in organizations. *Journal of Management*, 17(2), 407-447.
4. Rice, R. E., D'Ambra, J., & More, E. (1998). Cross-cultural comparison of organizational media evaluation and choice. *Journal of Communication*, 48(3), 3-26.
5. Timmerman, C. E. (2002). The moderating effects of mindlessness/mindfulness upon media richness and social influence explanations of organizational media use. *Communication Monographs*, 69(2), 111-131.
6. Trevino, L. K., Daft, R. L., & Lengel, R. H. (1990). Understanding managers' media choices: A symbolic interactionist perspective. In J. Fulk & C. Steinfield (Eds.), *Organizations and communication technology* (pp. 71-94). Newbury Park, CA: Sage.
7. Watson-Manheim, M. B., & Belanger, F. (2007). Communication media repertoires: Dealing with the multiplicity of media choices. *MIS Quarterly*, 31(2), 267-293.

Week 9: Structuration Theory

Formulation:

1. Orlikowski, W. J. (1992). The duality of technology: Rethinking the concept of technology in organizations. *Organization Science*, 3(3), 398-427.
2. DeSanctis, G., & Poole, M. S. (1994). Capturing the complexity in advanced technology use: Adaptive structuration theory. *Organization Science*, 5(2), 121-147.

Elaboration:

3. Contractor, N. S., & Seibold, D. R. (1993). Theoretical frameworks for the study of structuring processes in group decision support systems: Adaptive structuration theory and self-organizing systems theory. *Human Communication Research*, 19(4), 528-563.
4. Majchrzak, A., Rice, R. E., Malhotra, A., King, N., & Ba, S. L. (2000). Technology adaptation: the case of a computer-supported inter-organizational virtual team. *MIS Quarterly*, 24(4), 569-600.

Critique:

5. Pozzebon, M., & Pinsonneault, A. (2005). Challenges in Conducting Empirical Work Using Structuration Theory: Learning from IT Research *Organization Studies*, 26(9), 1353-1376.

Additional Readings (Not Required)

1. Chin, W. W., Gopal, A., & Salisbury, W. D. (1997). Advancing the theory of adaptive structuration: the development of a scale to measure faithfulness of appropriation. *Information Systems Research*, 8(4), 342-367.
2. Poole, M. S., & DeSanctis, G. (1990). Understanding the use of group decision support systems: The theory of adaptive structuration. In J. Fulk & C. Steinfield (Eds.), *Organizations and communication technology* (pp. 173-193). Newbury Park, CA: Sage.
3. Poole, M. S., & DeSanctis, G. (1992). Microlevel structuration in computer-supported group decision making. *Human Communication Research*, 19(1), 5-49.
4. Walsham, G. (2002). Cross-cultural software production and use: a structuration analysis. *MIS Quarterly*, 26(4), 359-380.
5. Yates, J., Orlikowski, W. J., & Okamura, K. (1999). Explicit and implicit structuring of genres in electronic communication: Reinforcement and change of social interaction. *Organization Science*, 10(1), 83-103.
6. Zack, M. H., & McKenney, J. L. (1995). Social context and interaction in ongoing computer-supported management groups. *Organization Science*, 6(4), 394-422.

Week 10: Practice Theory

Formulation:

1. Orlikowski, W. J. (2000). Using technology and constituting structures: A practice lens for studying technology in organizations. *Organization Science*, 11(4), 404-428.

Elaboration:

2. Boudreau, M.-C., & Robey, D. (2005). Enacting integrated information technology: A human agency perspective. *Organization Science*, 16(1), 3-18.
3. Vaast, E., & Walsham, G. (2005). Representations and Actions: The Transformation of Work Practices with IT Use. *Information and Organization*, 15, 65-89.

Critique:

Additional Readings (Not Required)

1. Boczkowski, P. J., & Orlikowski, W. J. (2004). Organizational discourse and new media: A practice perspective. In D. Grant, C. Hardy, C. Oswick & L. L. Putnam (Eds.), *Handbook of organizational discourse* (pp. 359-377). Thousand Oaks, CA: Sage.
2. Davidson, E. (2006). A Technological Frames Perspective on Information Technology and Organizational Change. *Journal of Applied Behavioral Science*, 42(1), 23-39.
3. Schultze, U., & Orlikowski, W. J. (2004). A practice perspective on technology-mediated network relations: The use of Internet-based self-serve technologies. *Information Systems Research*, 15(1), 87-106.
4. Yates, J. (2006). How Business Enterprises Use Technology: Extending the Demand-Side Turn *Enterprise & Society*, 7(3), 422-455.