

Tutorial On Egovernance Theory

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Outline

- Theory
- MIS and Egovernance research
- Actor Network Theory
- Structuration Theory
- Egov in Developing Countries

Theory

- What is theory? Why is it needed?
- “Theory is an *account* that is intended to explain or predict some *phenomena* that we perceive in the world”¹
- Phenomena understood by things, properties of things, states, events and changes in states
- Theory seeks to explain the states of things or events
- The account of the phenomena are the laws that are hypothesized to relate them
- There is considerable debate as to whether theory is needed or not

¹Weber, R. ‘Editor’s Comments: Theoretically Speaking,’ *MIS Quarterly*, 27(3), 2003.

Meta Theory

- Ontology: a theory of being
- Epistemology: theory of knowledge
- Assuming a theory exists is a commitment to an ontology
- Choice of method of research commits to ontology and epistemology

Theory in MIS Research

- Most MIS research was positivist; particularly in the period 1960s to 1990s²
- “The positivist philosophy of MIS research assumes an objective physical and social world independent of humans that can be characterized and measured. Thus, the researcher assumes the role of an impartial observer who attempts to uncover objective reality through defining constructs and precise measures.” (Alavi and Carlson, 1992)
- Alternatives to positivism evolved in the early 90's, such as interpretive and critical approaches
- E-governance research too is dominated by positivist approaches

²Alavi, M. and Carlson, P. 'A Review of MIS Research and Disciplinary Development,' *Journal of Management Information Systems*, 1992.

MIS Research: Conceptual Evolution

- Alavi and Carlson show that MIS has grown substantively over the decades; from 38 articles in 8 journals in 68-70, to 264 articles in the same journals in 86-88.
- The most popular subject areas of study were IS management (IS planning, evaluation, management), information systems (types of systems and applications), and IS development (design, implementation, life cycle strategies)
- A major trend in the research is in methodology, with a shift from non-empirical to empirical research
- Research was heavily linked to practice and applications; with few articles dedicated to pure theory

MIS Research: Conceptual Evolution

- Banker and Kauffman (2004) surveyed 60 years of MIS research appearing in the journal *Management Science*³
- About 200 articles on topics such as: decision support and design science; value of information; human-computer system design; IS organization and strategy; and economics of IS and IT
- Research questions addressed: How to get systems design right? How to evaluate IT for effective coordination? How to measure the value of IT influenced changes? How to manage systems investment? How to assess the value created by IT in the economy?
- Methodologies used: analytical models; empirical analysis and econometrics; statistical analysis; case studies; field studies and surveys; experiments and simulation; and qualitative methods

³Banker, R. and Kauffman, R.J. 'The Evolution of Research on Information Systems,' *Management Science*, 2004.

MIS Issues Common to Egovernance

- How to ensure relevant information is available?
- How to account for various abilities and cognitive styles of users?
- Why do users adopt systems?
- How to involve users in design and implementation?
- How to tackle fraud and security issues?
- Does IT lead to smaller organizations (government)?
- Does IT lead to increased organizational (government) productivity?
- How does system use impact productivity?
- How does technology diffusion happen in organizations (government)?

Broad Differences in MIS & Egov

Issue	MIS Research	Egov Research
User	Employee, Consumer	Bureaucrat, Elected Official, Citizen
Stakeholder	Private	Public
Evaluation/ Impact	Competitive, Profitability	Developmental, Political
Design	Efficiency, Economy, Process	Same

Conclusions: MIS and Egov Theory

- There is a need for an ontology of Egov research
- Theory evolved within MIS has strong relevance for e-governance problems
- Is there a need to look beyond positivist methods?
- There is a need to look beyond positivist methods!

The Social Shaping of Technology

- Social shaping of technology (SST) research ⁴
- Understanding technology: content of technologies and processes of innovation
- SST emerged through a critique of technological determinism
- Generation and deployment of new technologies requires choices and these are shaped by social factors
- Choices need not be conscious
- Negotiability of technology; questions irreversibility of technology; shows closure or stabilization of technology

⁴Williams, R. and Edge, D. 'The Social Shaping of Technology,' *Research Policy*, 1996

Origins of Social Shaping

- Critique of technological determinism (TD)
- TD held that nature and direction of change of technologies were pre-determined; and technology had necessary and determinate impacts
- TD influenced government policy
- SST showed that social and other factors shaped direction of technology, form of technology and outcomes of technology
- Sociology of Scientific Knowledge: discipline studying development of scientific field

A Model of Social Shaping

- Problematize the innovation process - not rational, not certain, bounded rationality (imperfect knowledge)
- Several frameworks - sociotechnical systems, actor-network theory
- Shaping begins at earliest stages - from invention (example, Edison invented filament for economic competition)
- Implementation is an important site of innovation - technical development is a spiralling rather than a linear process, including feedback
- User contribution to innovation - leading to interactive model of innovation, a complex social activity
- SST emphasizes the meso-level of activity between firms as well as intra-firm

Sites of Social Shaping: Technology/Organization Relationship

- 'Technology' and 'Organization' cannot be treated as separate categories
- Technology is not equipment alone
- Knowledge and expertise which created technology are embedded within
- Implemented technologies generate new forms of technology as well as generate new environments
- Technologies embody earlier divisions of labor
- Double dynamic: move to standardize, or to new configurations

Sites of Social Shaping: Consumption and Role of Markets

- See entire circuit of technology - design, production, use, consumption
- Market may have to be created to go with the product
- May have to contend with regulatory controls
- Coupling high between suppliers and users in rapidly developing markets
- Vertical and horizontal collaboration to share information and spread risks
- IT sector - emergence of standards, the black-box market (incentive for suppliers to collaborate)
- Emergence of dominant players to disrupt markets
- Mass markets - users represented by proxy

Actor Network Theory

- What constitutes the social?
- The social is a network of actors or actants
- Reverses the traditional approach – what is a theory that explains the evolution of a technology; to – what is the sociology constituted by technology in order to evolve
- The theory has predictive and analytical power

Actor Network Theory: Actors

- Actors may be human or non-human
- Actors have interests, goals, power, roles they play, or are assigned to them
- Actors are linked to each other through common interests
- Actors summon or enlist a cascade of other actors (action initiation)
- Non-human actors have properties that may change and thus change their role in the network
- The network evolves and has a history

Actor Network Theory: Networks

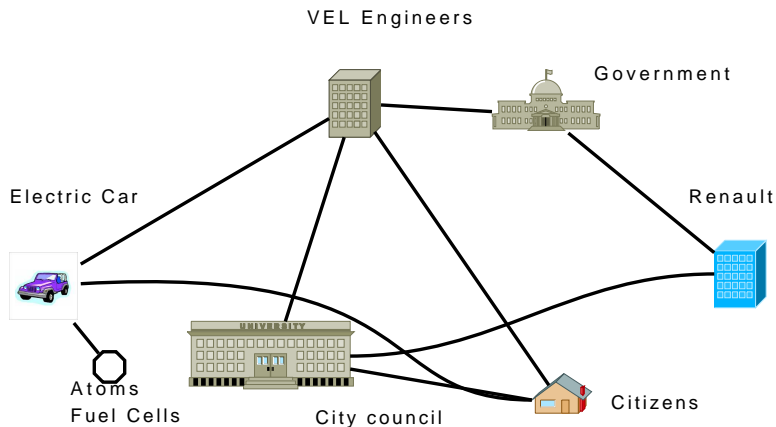
- Networks are created by links between actors
- These are heterogeneous associations
- Actors could spontaneously enroll other actors into the network
- Any actor is simultaneously an actor in a network and is constituted of a network (that is able to constitute and re-define itself)
- Networks are durable because of the bonds between actors

ANT: Simplification and Juxtaposition

- Simplification: in theory actors could have infinite associations; in practice actors limit their associations
- Simplification enables the analyst to draw on a limited but relevant set of actor entities
- Juxtaposition: simplification is possible only in a context, which is known as the juxtaposition to other entities to which the actor is linked
- Simplification is possible when relations are juxtaposed

Example of Actor Network

Actor Network for VEL Electric Car



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⁵Adapted from M. Callon "Society in the Making: The Study of Technology as a Tool for Sociological Analysis," 1987

Example of Actor Network

Actors in Portuguese Navigation

Cape Bojador



Portolano Chart



Coast of Africa



Galley



Quadrant



Wind
Men
Wood
Pitch
Sailcloth

Compass



Carvel



Astrolabe



Cannon



Vasco da Gama



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⁶Adapted from J. Law "Technology and Heterogenous Engineering: The Case of Portuguese Expansion," 1987

Example of ANT Analysis: GIS for District-Level Administration in India

- District-level administration ⁷
- GISs have potential for district-level management
- Key research question: has GIS been successfully implemented for district management? If not, why?
- Longitudinal study over three years
- Focus on views of human stakeholders concerning use of technology
- Methodology of contextualism: actions of human actors and the context within which this took place

⁷Walsham, G. and Sahay, S. 'GIS for District-Level Administration in India,' *MIS Quarterly*, 1999.

ANT: Additional Concepts

- Theory is evolving; cannot be drawn on in unproblematic way
- Enrollment: creating a body of allies with aligning interests
- Translation: process by which interests are aligned
- Delegates and inscription: those who “stand in and speak for” viewpoints
- Irreversibility: degree to which impossible to go back to point where alternative choices exist
- Black box: a frozen network element
- Immutable mobile: network element, irreversible, transcends time and place
- The idea of software as “frozen discourse”; inscription that resists change, is irreversible

Interests Inscribed in GIS Technology

- Computer systems reflect western societal interests and attitudes
- Indian intellectual tradition of intuitive approaches, goals of maintaining personal relations; decision making based on karma, rebirth
- Marked contrast in dominant underlying attitudes between Indian and Western actors
- India not a map-based culture; Indians rarely use maps in daily life; map-based society inscribed in Western technology
- Multi-layering of GIS systems, example agriculture, forestry on single map; contrast with sharp division of labour and coordination of action
- Western ideas of coordination and joint work at odds with Indian culture; technology is an immutable mobile, carries attitudes across time and space

Network of Aligned Interests

- 3 groups: US-based actors, central government officers, Indian scientific institutions
- GIS experts from the US; Indian project director key actor
- US approach problem-driven; Indian officials more technology-driven
- Poor role of local GIS vendors; district officials more as data suppliers, not primary GIS user
- Dependence on data from remote sensing useful for certain tasks; district officials concerned with population or livestock not available in that data
- Differing goals of project director and district officials in continuing with the project

Implications for practice

- GIS not used successfully to date
- Stable set of key actors with aligned interests had not been fully achieved
- Transition to district-level is a major social change and would take years, not months to achieve
- Senior Indian Administrative Service officers not oriented towards technology; training and awareness-building is required
- Cooperation between government agencies can be achieved only with the highest political involvement
- Change in India is possible
- Use of simple maps as a starting point

Conclusions: ANT Relevance for Egov

- Emphasis on actors, key players and technology
- Interpretive, flexible theory, able to address complexity
- Local and historical context is key to analysis
- Evolving theory; careful analysis is required

Structuration: An Introduction

- Outlined by Anthony Giddens in *The Constitution of Society: Outline of a Theory of Structuration* (1984).
- In opposition to positivist approaches dominating sociology
- A meta-theory of structure/agency, objectivity/subjectivity
- Central ideas: praxis, duality of structures
- Though unacknowledged: resonates with social shaping of technology

Structuration: An Introduction

- *... most social scientists already have made certain assumptions of an ontological nature about the social world which shape their epistemological and methodological decisions, as well as their definitions of empirical problems. These assumptions involve matters of nature of social action, social relations, and social systems, and the like. ... Structuration theory, however, presumes that these ontological assumptions deserve close attention and sustained elaboration. ... It does not develop substantial accounts of the empirical social world in any given socio-historical domain, structuration theory is designed to inform the development of such accounts. That is to say, it provides ontological resources for the formulation of empirically oriented theory and research.*⁸

⁸Ira. J. Cohen. "Structuration Theory: Anthony Giddens and the Constitution of Social Life." 1989

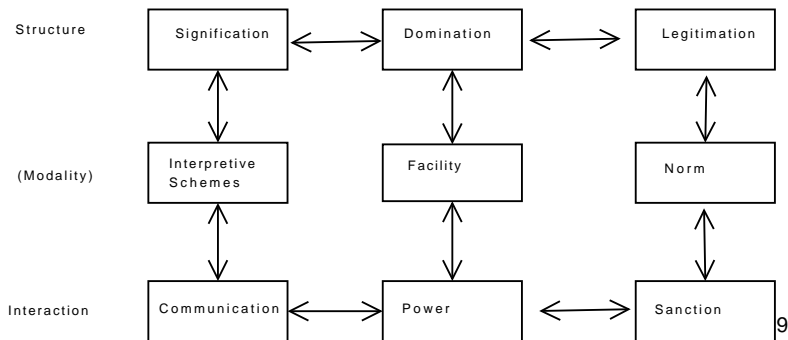
Structuration Theory

- Human actions are enabled and constrained by structures, but these structures are result of previous actions
- Structure manifest in structural properties: rules and resources that human agents use in their everyday interactions
- Humans reaffirm structural properties, and avoid reification
- Humans are reflexive, think about their own actions; discursive and practical knowledge is used, one is discursive or can be articulated and the other is tacit
- Reflexivity is limited by unintended consequences, unconscious sources of motivation
- Through repetitive use, patterns of actions become structural properties of organizations
- Duality of structures - objectivity of structures and subjectivity of human actors

Meaning, Power and Norms

- Humans create and recreate three fundamental elements of social interactions - meaning, power, norms
- Human interaction involves constitution and communication of meaning - when institutionalized these become *structures of signification*, which are organizational rules that define interaction
- Meaning created through interpretive schemes
- Power is transformative capacity - the ability to transform the material and social world; exercised by using authoritative and allocative resources; when institutionalized they constitute *structures of domination*; asymmetry in resource use
- Norms are rules governing legitimate or “appropriate” conduct; when institutionalized they constitute *structures of legitimation*
- Structures of legitimation are articulated and sustained through rituals, socialization practices and tradition

Dimensions of Duality of Structure



⁹Adapted from M.R. Jones and H. Karsten "Giddens's Structuration Theory and Information Systems Research," *MIS Quarterly*, 2008.

The Duality of Technology

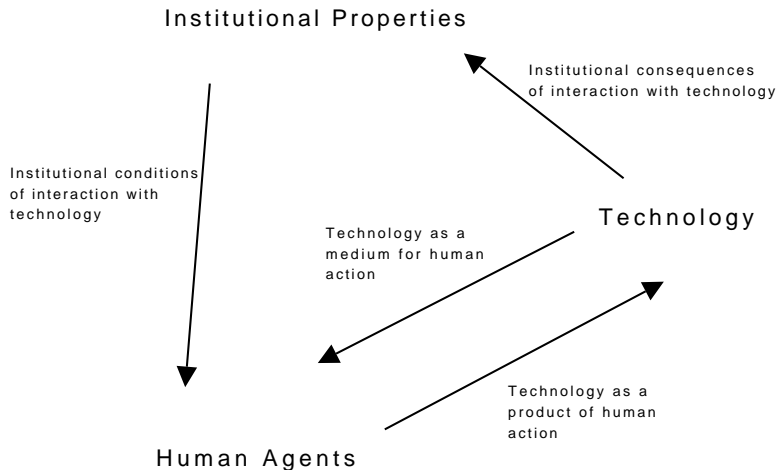
- Prior conceptualizations of technology restricted: eg. technology as hardware ¹⁰
- Earlier work is problematic because technology seems to have unidirectional causal influence, ignoring the actions of humans
- Some work emphasized actions of humans too heavily, eg. fluid workplaces, easily defined by technology
- Other work looking at social construction of technology at design phase, but not during use (Marxist school)

¹⁰W.J. Orlikowski "The Duality of Technology: Rethinking the Concept of Technology in Organizations," *Organization Science*, 1992.

Premises of Structural Model of Technology

- Duality of technology - technology is a product of human action, while it also assumes structural properties
- Technology is socially constructed by actors through use; however, once deployed tends to get reified
- Ongoing action of humans on drawing on a technology objectifies and institutionalizes it; human action is knowledgeable and reflexive
- Interpretive flexibility of technology - extent to which users of a technology are engaged in its constitution during development or use; technology often designed in one organization, used in another may appear objective and fixed
- Useful to see the *design* mode and the *use* mode; users interpret, appropriate, and manipulate technology
- Example of sabotage and avoidance of use of more rigid technologies

Structurational Model of Technology



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¹¹Adapted from W.J. Orlikowski "The Duality of Technology: Rethinking the Concept of Technology in Organizations," *Organization Science*, 1992.

Example of Beta Corporation

- Beta is a software development corporation that has created tools for engineers to use to write software
- The Tools contribute to Beta's structure of signification because the knowledge embedded in them directs the manner in which problems are interpreted and work is conducted
- Tools contribute to Beta's structure of domination because they constitute resources which are deployed in order to control the work of consultants
- Tools constitute Beta's structure of legitimation because they sanction a particular mode of developing systems, and propagate a set of norms about what is and what is not acceptable "professional" social practice
- Example shows how technology cannot be conceived as a fixed object at any stage during its deployment and use

A Practice Lens for Studying Technology by Orlikowski, 2000

- Role of emergence and improvisation in technology and technology use
- Addresses problems of earlier research: technologies become stabilized after development; and technologies 'embody' structures that represent various social rules and political interests
- When humans interact regularly with a technology, they engage with some of the material and symbol properties of the technology. Through such repeated action, technologies become implicated in process of structuration.
- The resulting recurrent social practice produces and reproduces a particular structure of technology use.

Main Argument

Structures of technology use are constituted recursively as humans regularly interact with certain properties of a technology and thus shape the set of rules and resources that serve to shape their interaction. Seen through a practice lens, technology structures are *emergent*, not embodied.

Frame what users do with technology not as appropriation, but *enactment*.

Practice Lens

- Technology as artifact and technology use
- Use of technology involves repeatedly experienced, personally ordered and edited version of artifact; experienced differently by different individuals and also by the same individual at different times; this is the *technology-in-practice*
- Despite built-in properties and features, users often ignore, alter, or work around them
- In structurational analysis, one must foreground some structures and background others
- Structures may be reinforced or transformed
- Every engagement with technology is temporally and contextually provisional, and thus there is, in every use, always the possibility of a different structure being enacted
- Practice lens focuses on open-ended set of emergent structures

Conclusions: Structuration Relevance for Egov

- Comprehensive meta-theory to understand 'nature' of society
- Emphasis on context, structure and praxis
- Often mis-understood and mis-used (Jones and Karsten, 2008); careful analysis required
- With ANT, Structuration constitutes powerful duality theories for understanding egovernance

Egov in Developing Countries

- Challenges different for developing countries – digital divide, political environment, computing infrastructure etc
- Many problems unfamiliar to existing literature on egov; special issues of *MIS Quarterly* and *The Information Society* dedicated to this topic
- Important issues: egov's contribution to development; local adaptation; cross-cultural learning; developmental bias
- Neglected issues of power, politics, corruption, resistance, conflict
- Dominant methods and theories are positivist

Overall Conclusions

- Theory development in Egovernance research is past infancy; but still very young
- MIS is the parent discipline; rich body of literature to rely on
- Strong need for inclusion of interpretive, critical theories and methods

Thanks much for attending!