Extending social constructivism with institutional theory: A broadband civic networking case

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Abstract. A longitudinal study of broadband civic network design is analyzed using social construction of technology (SCOT) approach and then through the lens of institutional theory. SCOT is useful to show *how* artifacts take on the forms they do; institutional theory, by locating (design) action in a cultural, historical and structural context can complement SCOT by explaining *why* they tend to assume certain forms. Broadband civic networking initiatives often have mixed goals: ensuring financial viability and realizing normative social aims. In the present case, this tension was resolved by fitting the network's technological and social form to a criterion of legitimacy prevailing among power centers in the broader field; this succeeded in eliciting necessary financial resources to sustain the network, but at the expense of the project's normative aims. Institutional approaches theorize the relation of cultural ideas and social structure, and that of structure and social action, to interrogate micro-politics of social constructions and the (intended/unintended) forms they assume. To engage the *Why* question, constructivists need to theorize action. Sociological institutional theory offers pointers.

This paper documents design of the Urban-net, a broadband civic network. The Urban-net project was funded by a New York state program. In 1995, as part of a settlement of a regulatory case, Telco (a telecommunications service provider) committed $50 million to develop and deploy advanced telecommunications infrastructure/services in economically poor and underserved areas. A program was set up to solicit proposals from consortia of public organizations (e.g., local government, schools), community-based organizations (CBOs), and small businesses via a competitive request for proposals (RFP) process.

Network subscribers paid subsidized service charges and were eligible for additional funds for user training or customer premise equipment (CPE). Eighty per cent of the grant returned to Telco to fund development/deployment of network infrastructure and services. Grant funds could not be used toward technical staff or consultants or software development. To be eligible for the subsidy, subscribers were required to connect to the network backbone, which would inter-connect subscriber sites and the Internet.

A project steering committee (hereafter committee) with public organizations, CBOs and private citizens was formed to submit a proposal, which was subsequently granted $3.8 million. Small businesses were poorly represented and are left out of the analysis. Values espoused by the program were internalized by the committee via contact with selection committee members during proposal development; an aim of the project, accordingly, was to develop the Urban-net as a civic network delivering public information, social services and broadband technology access to residents. The larger aim was to improve quality of life in social and economic terms (access to information/services and job opportunities) for residents and cross-agency cooperation among service providers.

(De)Constructing the Urban-net

We trace the design of the Urban-net over thirteen design meetings using social construction of technology (SCOT) (Bijker, 1995). To show that artifacts are socially shaped, the analyst deconstructs the artifact on its meanings for relevant social groups (RSGs) and traces how some lose and others gain ground.

Groups participating in design -- the committee, public organizations, CBOs -- had previously shaped planning and proposal development as co-authors, respondents and research informants and endorsed the proposal's interpretation of the Urban-net as a civic network. The other participants – Telco designers, responsible for technical network design – came into the process espousing the program's aims, which matched this interpretation. Groups' interpretation of the Urban-net began to diverge when design got underway. These interpretations were not mutually exclusive: the realization of one would not have precluded the realization of the others. But one prevailed over the others to closure.

A technological frame provides actors with conceptual resources to interpret an artifact. It can organize actors by helping communicate their assumptions /expectations and recruit others to their interpretation (Bijker, 1995). The frame helps constitute the artifact and group(s) with reference to it; its effects are material as well as social. Bijker enumerates elements of such a frame. In Table 1, we use Bijker's operationalization to describe the committee's original framing of the Urban-net as a civic network. Securing subscription commitments was the committee's goal for the design process. Public organizations and CBOs would have to subscribe to the Urban-net for the project's social aims to be realized.

The Urban-net's technological infrastructure would comprise two parts: network backbone and the access network. Backbone refers to switching equipment at Telco central offices (switching centers) and to telecommunications links inter-connecting central offices. The access network linked the central office to subscriber site. Telco designers had a two-fold design objective: specification of backbone capacity (the number of subscribers it would support and the speed at which it would support them) and access network end-points: what user sites would connect to the backbone using what services? Four access network services were eligible for subsidies at start of design: digital subscriber line (the slowest and cheapest broadband service and the only service CBOs could afford and were interested in) and asynchronous transfer mode/cell relay service (ATM/CRS) at three different speeds, all of them significantly faster and pricier than DSL. Later in the process, DSL was dropped for regulatory reasons and gigabit Ethernet service added to the list.

At meeting # 4, designers' focus shifted from the access network to the backbone in response to the frustrations they faced in estimating user demand (Table 2). CBOs needed information on the CPE relief amount, which was computed by program authorities and was not yet known. The Urban-net planning process had revealed just how poorly equipped CBOs were in their ICT and support infrastructure; CBOs saw in the project an opportunity to upgrade their ICT and Internet access capacity (Table 4), but whether they could afford the upgrades or not depended on the CPE relief amount.

Around meeting # 5, general managers who had represented public organizations on the committee from the project's outset began yielding their seat to their MIS managers. MIS managers appeared unaware of or did not share the project's social aims; they were concerned with cutting telecommunications costs via the project's subsidized services. ATM/CRS was new to them, and they were wary of it for that reason; they were concerned with the additional costs of upgrading CPE upgrades and help-desk support that subscription to ATM/CRS would entail. They were shopping for a backward-compatible service, and ATM/CRS did not fit. They were not interested in DSL.

The picture changed dramatically with the announcement, in meeting # 6, that gigabit Ethernet service was now eligible for program subsidies. The service was attractive to MIS managers. They knew the technology well: it was based on the Ethernet technology their office LANs used. Thanks to its "enormous" bandwidth, they could use the service as a cost-effective intra-organizational backbone to link their campuses over the Urban-net backbone (Table 3), replacing multiple T1 connections with a gigabit Ethernet connection at significant savings.

The decisive turn in closure process occurred in meeting # 8. The committee learned of a program ultimatum that grant funds would be reallocated if signed contracts were not in place by the first quarter of 2000 (all second round projects were subject to the condition). The project manager argued that unless public

organizations signed up for high-end services the grant was in jeopardy, and implied that even if CBOs signed up for a low-end service like DSL it would not avert revocation. This interpretation proved influential within the committee and resulted in self-enlistment of a majority of its private citizen members in the MIS managers' frame (Urban-net for cross-organizational connectivity). MIS managers' enthusiasm for gigabit Ethernet coupled with their financial resources assured the committee that the grant would be secure from revocation. Protecting the grant became the urgent new project aim, in light of which public organizations were cast as indispensable *early adopters*. The project's social aims could be addressed in the future, after the *crisis* (revocation risk) was averted; rhetorically, *early adopters* allowed for later adoption by the rest. As it turned out, DSL became ineligible for subsidies and the Urban-net was priced out of CBOs' reach. The committee had hoped a DSL substitute might be approved, but this did not occur.

Closure resulted from three transition points. The first was a transition from the social to the technical and differentiated the project's technological means (the backbone), projected as achievable in the near-term, from its social ends. Approval of gigabit Ethernet catalyzed the second: the shift from inter- to intra-organizational connectivity, a shift favored by MIS managers. In the third, the Urban-net's institutional entrepreneurs (DiMaggio, 1988) – the project manager and his private citizen backers on the committee -- appropriated the rationale of the first transition (designers' differentiation and temporal sequencing of the technological and the social) and fused it with an extant social organization (the committee) in support of the second, powering MIS managers' frame to closure.

Private citizen committee members opposed to the institutional entrepreneurs' interpretation of the ultimatum (hereafter referred to as dissidents) advocated fidelity to the project's original aims with a cross-subsidy proposal (meeting # 9):

> "Since the large players are getting such a good deal, could we require them to provide resources and services to the community and the smaller agencies? Large players have to see themselves as resource providers. This is part of their responsibility..."

The committee as a body never revisited this argument. The project's social aims were dormant at best at this time; "getting the network off the ground" and averting the "crisis" dominated committee discussions post-ultimatum.

Public organizations' readiness to commit to gigabit Ethernet refreshed debate in the committee over an omnibus service contract versus bilateral contracts. With the first, the committee would negotiate one contract with Telco covering all subscribers. With the second, subscribers would negotiate contracts bilaterally with Telco. From meeting # 7 on, dissidents were vocal in backing an omnibus contract. By aggregating demand and negotiating as a buying group, they believed volume discounts could be realized to cut subscription costs. The contract could be drafted to benefit future subscribers as well.

Late in the design process, the committee learned that services pricing would be subscriber-specific. The committee's assumption that charges would be lower

if more sites signed on proved to be incorrect. Telco's clarification on subscriber-specific pricing strengthened the case for bilateral contracts made by MIS managers. They argued that an omnibus contract was infeasible and that it would jeopardize the grant by delaying the contracting process.

The sequence of turns leading to closure was not the product of conspiracy among these groups to bias organizational form. The first transition stemmed from an institutionalized response to challenges the designers faced in securing subscription commitments. They realized they had to actively sell the Urban-net services to prospective users, and this was not part of their regular job or project responsibilities. They reacted to their predicament by reverting to their habitual identity and modus operandi as technical professionals with well-defined, taken-for-granted work practices and jurisdictional boundaries. MIS managers reacted to gigabit Ethernet in line with their institutionalized organizational role. The habitual frames these actors fell back on in the situation were *assumptive* frames – institutionalized interpretive schemes that structure day-to-day meaning-making and "mediate the routine enactment of organizational life" (Ranson, Hinings & Greenwood, 1980). Assumptive frames remain taken-for-granted and unarticulated in the *routine of action* and may be entrained when conditions are ill-defined to structure action along reassuringly habitual lines. Designers' and MIS managers' actions were independent of one another but stemmed from similar motivations: enacting routines was their way of coping with situational indeterminacy and the lack of an unequivocal action script structured and legitimated by the project's social aims. Their organizational role came with institutionalized criteria for validating their own and others' situated behavior; their project role did not.

The institutional entrepreneurs' interpretation of the ultimatum was an instance of *strategic* framing – "conscious strategic efforts by groups of people to fashion shared understandings of the world and of themselves that legitimate and motivate collective action" (McAdam, 2003). While designers' and MIS managers' actions were structured by assumptive frames, the institutional entrepreneurs reframed the committee's collective identity and mission relative to the project's initial frame.

Theorizing organizational form and action

Closure entails a stabilization of social relations as well as a particular technological form and its cultural meaning(s). We use institutional theory to interpret closure as the emergence of "orderly, stable, socially integrating patterns" of order from unstable conditions (Selznick, 1949). Institutionalization refers to the process by which *institutions* -- cultural abstractions like rules, shared meanings, logics -- are fused with *social organization* to constitute repeated patterns of interaction (Fligstein, 1999). The SCOT idea of closure, per

this view, is the process of institutionalization or stabilization of a social arrangement structured by, and structuring, the particular material form assumed by the artifact. Stress is on the word *repeated*: assuring ongoing reproduction of the constructed order via social interaction is a defining feature of institutionalization (Jepperson, 1991).

Institutionalization of new organizational form plays out in micro-interaction and in the broader relational field that embeds it. New institutionalists theorize relation of micro- to macro-social – individual-level action to social structure – by arguing that action is constrained (not determined) by actors' cultural and organizational affiliations. In using this view, we address gaps in current theorizing in the so-called "new" institutionalism. Institutionalization as a process (versus institution as achieved state) is a neglected area, as is the role of interests, power and opportunistic action in the process (Hirsch & Lounsbury, 1997). Rejecting the rational actor model of purposive behavior, new institutionalists view *order-affirming* action stemming from taken-for-granted worldviews that socialized actors reproduce without conscious thought; such behavior reproduces the existing order (DiMaggio & Powell, 1991). A concern with institutional persistence derives from new institutionalism's structuralist slant, but it cannot explain organizational change and emergence of new forms. To explain genesis and change, one must grant actors the ability to behave rationally and strategically in *order-challenging* ways. Even new institutionalists note limitation of a "theory that denies the reality of purposive, interest-driven" behavior (DiMaggio, 1988).

If new institutionalists have focalized persistence of order, "old" institutionalists like Selznick (1949) were concerned with the role of interests, power and agency in the genesis and transformation of organizational form. We need both old and new institutionalist perspectives to account fully for organizational dynamics. New forms emerge not in a social vacuum but in relation to an existing order. This order with its institutionalized power relations and opportunity spaces (Brint & Karabel, 1991) shapes emergent organizational form and constrains conduct of actors in it. As *constrained entrepreneurs* (Brint & Karabel), actors are capable of *acting new* orders into being; they are not condemned merely to reproduce or *enact* the existing order. Contending actors' relative power is a critical issue at such times. This paper catches the Urban-net's technology and social organization at a definitive moment of "institution-building", in the conflicted, inherently political process leading to technological and social stabilization.

Why did stabilization occur along certain lines? More generally,

> "Where new organizational forms come from is one of the central questions of organizational theory…(N)ovel social structures matter because they underpin organizational diversity" (Rao, 1998, p. 912).

Organizational diversity enhances society's capacity for social innovation. The Urban-net was proposed to institute new relational patterns across organizations and functional sectors, infusing structural diversity into the field. Despite this aim, the resulting form reproduced existing social arrangements; instead of catalyzing new relations, the Urban-net's technological and social configuration affirmed prevailing ones. The Why question – Why did the Urban-net take on the form it did? – is the empirical version of the question on formal origins and directs attention to the particular macro-structural and micro-contextual forces that patterned the Urban-net in a particular way.

Macro-structure

All organizations are "located within broader social structure that will constrain the forms they can develop" (Ranson et al., 1980). As artifacts develop in a particular social-historical milieu, dominant cultural logics and organizations directly or indirectly influence emergent form. Second, pre-existing structures and logics subsume a potentiality – causal *tendency* -- to reproduce themselves in the emergent form through, for instance, control over financial resources. As open systems, organizations depend on the environment for resources, and "external control of resources is one type of…constraint" on emergent form (Kimberly, 1975). Resource-holders will steer resources to where "their own interests would be respected", and organizational elites can successfully elicit resources to the extent they can provide such assurance. The nature and direction of such influence and consequences for emergent form are key analytic concerns. The analyst would identify macro-structural forces impinging on the micro-social setting where developmental work actually occurs and (a) evaluate whether or not their reproductive potential was realized in emergent form and (b) specify contextual contingencies activating/deactivating this potential en route to stabilization of a particular form (Tsoukas, 1989).

For realist sociologists, macro-structure is temporally prior to action (Archer, 1995). An actor confronts structure as an objectified "accretion of past practices and understandings" (Barley & Tolbert, 1997). Macro-structure is both product of and constraint on human action (Barley & Tolbert): it must be continually and necessarily *enacted* – instantiated in action – if it is to organize social life and have social consequences. The relation is structurational, mutually-constitutive. To the realist, the social world is differentiated and stratified (Tsoukas, 1989). Incumbents hold positions in macro-structure; positions pre-exist incumbents and pattern their access to resources and constrain their behavior. Relations between positions (not incumbents) describe macro-structure (Porpora, 1989). A firm manager has power to fire or promote a subordinate; the firm itself may be implicated in authority and dependency relations with other entities in its

operating context. Causal powers (of control in this case) stem from the position and its incorporation "into a wider structure of relations of production" (Tsoukas).

We locate the Urban-net actors in a particular macro-structure or inter-organizational field – defined as social relations linking organizations "lacking formal authority over one another…(located) within a…limited geographical area" (Scott & Meyer, 1991). We bound the field to include all eligible organizations and Telco. This field historically pre-existed the project and implicated the players – public organizations, CBOs, the committee, Telco – in a web of constraints and opportunities. Actors representing these players were both constrained and enabled by the field, which aided realization of some interests and frustrated others. To prevail, actors need power over others: all contests occur within structures "that have not been created by the actors involved… (T)he first such structure is the existing distribution of power itself" (Munch & Smesler, 1987). Macro-power distribution typically is asymmetrical.

SCOT has been criticized for its inadequate conception of social structure (Winner, 1993). Bijker has since responded to his critics, viewing social structure as a "contingent set of heterogeneous relations" and directing analysts to model (action) "*patterns* that arise when social groups are constituted and interact with one another in a range of different structural circumstances" (1995). However, he elides a key question: Why are certain patterns more likely to stabilize than others? Constructivists must explain why artifacts, and the social organization of consensus that develops around them, tend to assume particular forms (this is a question in new institutionalism as well, see Brint and Karabel, 1991).

In any field, some entities are more powerful than others due to their structural position and access to resources. Power centers can decisively shape the milieu within which actors act. Analyzing the re-positioning of community colleges as terminal vocational schools from academic feeder schools, Brint and Karabel (1991) note that power can result from contextual influence, as measured by an organization's centrality for the operating context of relevant others. Four-year colleges, who had been contextually influential as coveted targets of junior college transfers, yielded ground to business firms when job credentialing, not credentialing for transfer, become junior colleges' reformulated interest and mission. In the present case, public organizations were well-entrenched power centers. They were seats of administrative authority – city and county government agencies – and providers of necessary services -- public libraries, education, healthcare. Relative to CBOs, they were well-resourced, which rendered them contextually influential with businesses like Telco. Initially, their centrality to the project stemmed from their ownership of information others relied on. Some had statutory oversight authority (for example, the county administered Medicaid), which meant no services-related initiative could expect to succeed without them.

For Telco, public organizations' contextual influence stemmed from their buying power. They represented large business accounts to be courted ahead of

the competition. They had always been valued clients due to their size, and now they represented a strategic opportunity field for high-end broadband services through the project. Telco was itself a power center, its historical significance as a major local employer was further enhanced by its designation as authorized provider of program-approved services. But public organizations could always threaten to take their custom elsewhere if they were not satisfied, as was demonstrated when, frustrated by design delays, MIS managers moved the committee to float a request for quotes to competitors for the service they wanted (gigabit Ethernet). The area featured aggressive smaller telecommunications firms and this strengthened their hand. This action put the committee on notice as well: MIS managers' tolerance for delay was limited. They could, if they chose, bypass the committee and deal directly with providers, as soon became evident.

The committee's dependency relation with public organizations and the latter's contextual influence with the committee were defined and amplified by the institutional entrepreneurs' interpretation of the ultimatum. They were deemed indispensable for the project; they were the only group that gained influence during the design process. Their centrality to the project now stemmed from their financial resources. CBOs' influence with the committee waned. Their interest in a DSL-like service was deemed insufficient to avert revocation. They were not as vital to the committee's operating context at this time.

The committee failed to emerge as a power center independent of the public organizations. The committee was a formally-constituted body, with legal powers to represent subscribers in contract negotiations. But it never developed an independent identity or managerial capacity to act cohesively. At meeting # 7, for instance, a legal professional consulted by the committee exhorted it to start "functioning as a committee". The comment was with reference to rumors that some public organizations, exploiting the competitive situation, had initiated contract discussions with service providers bypassing the committee. The consultant urged the committee to ensure that "no one (participates) in the project except through you". Instead, the reverse happened. The committee cast itself as a subsidiary actor to public organizations; it diminished to a nominally authoritative actor that legitimized MIS managers' interest by enlisting in their frame. By self-enlisting, the committee saved itself from irrelevance and legitimized its official role as the project's sole authorizer.

A structuralist would argue that actors' access to "power and resources determine(s) the degree to which…interests are realized" (Fligstein, 1999). Public organizations prevailed because of structural power, which stemmed from their control over resources -- resources that were necessary given the economics and technical complexity of broadband. But attributing formal variation to resource availability is incomplete and deterministic if it is assumed always that resources pre-exist in a given structure as "pools of free-floating assets" (Rao, 1998). Often actors must actively mobilize resources through social coalitions. Institutional

entrepreneurs create opportunity in a field of constraints, in the process reframing meanings, interests, relations and self-identity. By negotiating strategic coalitions, actors can change social structure (albeit slowly and not easily).

With their cross-subsidy proposal, dissidents attempted to redistribute resources more equitably in the field. By leveraging the program subsidy, they sought to mobilize new resources from public organizations to assist CBOs get online. The dissidents invoked the progressive activist identity implicit in the civic networking frame, and their proposal resulted from allegiance to the Urban-net's original mission as a services delivery amenity: the greater the diversity of service providers, the greater the range of services and populations supported. Dissidents felt (as did program selection committee members) that CBOs, as grassroots operations, often had a better sense of neighborhood needs and served them more effectively than larger providers. Bringing CBOs online would expose their clientele, among the area's poorest, to broadband and the Internet and online information, helping bridge the digital and economic opportunity divide. As vital neighborhood access points for Urban-net resources – even if these were, to start with, restricted to information and Internet access pending development of other services -- CBOs would gain contextual influence with the committee, thus re-defining the relationship to their advantage.

Interests "are built into a … position by the relationship of that position to other positions" in social structure (Porpora, 1989) and supply incumbents with "presumptive motives for acting". The behavior of designers, MIS managers and CBOs is amenable to a structuralist reading. Designers entered the design process espousing two interests. The first stemmed from their position at Telco: to build the Urban-net infrastructure. The second stemmed from the project's social aims. The tension between these interests only became evident as the process unfolded. Designers' focus shift to the backbone resulted from preference for predictability and control that technical specification afforded (recall that they had to sell access network services, a task they were not used to). A preference for predictability is a universal interest structuring much social behavior (DiMaggio, 1988).

MIS managers' cost-cutting interest predated the project and was articulated in the frame they brought with them to the committee. The Urban-net's subsidized service charges were most appealing to them given the doing more with less environment they operated in. Despite differences in organizational size/function, financial/ICT resources and administrative structure, and despite never operating as a group, these actors all interpreted the project in the same way: as a cost-cutting opportunity. Roles/relations affiliates have with technology tend to influence their framing of it (Orlikowski & Gash, 1994). MIS managers saw low-cost technology/services as vital to the operating efficiencies their organizations demanded of MIS. They could readily use institutionalized, standardized criteria to evaluate such opportunities in technical and financial terms. Furthermore, their

interpretation of the project reflected the way their organizational superiors likely evaluated their role performance (Orlikowski & Gash).

CBOs were attempting to systematize their fund-raising operations and smarten up their image over the period covered by this research. The Internet had emerged as an indispensable tool for fund-raising through broad solicitations and by facilitating access to information on grant opportunities. CBO representatives referred to exemplar CBOs that had used the Internet strategically to grow their organizations. They were under pressure -- from their boards and donors, and often from themselves, from their self-identity as service professionals – to emulate these success stories. CBOs did not see themselves as a group for the many differences – in size, function – that separated them. Rather it was the common challenges they faced – lack of resources, including ICTs, and crippling dependence on ever-diminishing state and federal monies (prompting a search for alternative sources) – that made for a remarkable uniformity of response to the Urban-net as an Internet access ramp.

Interests must also be viewed as products of cultural-political (re)construction by actors; interests are not immutable but can change. Organizational interests form in opportunity spaces in the inter-organizational field (Brint & Karabel, 1991). Post-ultimatum, the Urban-net's institutional entrepreneurs succeeded in eliciting resources from the environment by reformulating the committee's mission and collective interest to securing the grant (versus securing the project's social aims), with the change defended as the outcome of re-assessment prompted by the "crisis". MIS managers' willingness and ability to subscribe (versus CBOs' indecision) provided the opportunity and was used as justification for the change. Their interest was effective – interest backed by necessary resources -- and the committee's revised interest was shaped by that of the project's "rescuers": mobilizing effective interest was portrayed as the only viable response to the crisis. Crises provide classic institution-building leverage points (Fligstein, 1999).

An organization's environment can constrain its form through control over resources and by prescribing constitutive norms of legitimacy (Ranson et al., 1980). The two could be mutually-supportive: (re)framing the Urban-net to fit with MIS managers' notions of what was formally "desirable, proper (or) appropriate" was successful in attracting resources. Dissidents' cross-subsidy plan, and their proposal for an omnibus contract, on the other hand, fit poorly with cultural models available to resource-holders; MIS managers rejected them claiming there was no organizational precedence for such practices. The Urban-net's institutional entrepreneurs aligned themselves with MIS managers in respect to these proposals, but were careful to reassure dissidents that the project's social aims were merely being deferred. They were careful to justify their actions because one of the dissidents spoke unofficially for the Mayor and was affiliated with the unit that was funding the project manager's position.

How did elite actors manage to mobilize strategic coalitions for closure without losing key actors opposed to them? A key lies in cultural-political discourse. Micro-interaction analysis allows study of meanings, interests, identities and relations as actors construct and reconstruct them in discourse en route to forging strategic coalitions and stabilizing the social (and technological) order (Fligstein, 1999). It allows the analyst to link situations and interactions to embedding macro-structures, to analyze how these intersect and with what consequences for emergent form. A preliminary, micro-level discursive analysis of closure is summarized below, using the medium of technological frame.

Constructivists can learn from social movement research on the "dynamics of collective action at the intermediate meso level" (McAdam, 2003) – specifically, discourse mechanisms actors use – to analyze the macro-micro intersection. Social movement theory is concerned with conflictual politics of change and can illuminate "how collectives coordinate their efforts to challenge the existing order" (O'Mahony, 2002). The politics of institution-building have been characterized in social movement terms (Fligstein, 1999). Analyzing micro-level coalition formation is crucial to understanding the micro-construction of artifacts. Coalitions themselves are socially constructed, first in terms of social categories – race, class etc. Institutional entrepreneurs then (re)construct strategic coalitions by framing meanings, interests, identities and relations discursively to realize preferred aims. Bijker's (1995) micro-politics can be sharpened with insights on the *micro-construction* of frames and social coalitions.

Micro-politics

Technological frames guide group interaction by furnishing members cultural meanings, goals and "tools…for action" (Bijker, 1995). Invoking Giddens' notion of structuration, Bijker suggests that frames need to be "continuously sustained" by the actions that they both enable and constrain; they must be enacted. They help structure, and are structured by, the social dynamic that stabilizes both the artifact and the group: the "construction of the artifact, the forming of a relevant social group, and the emergence of a technological frame are linked processes" (Bijker). Bijker sees frames arising from social interaction. They are "not an individual's characteristic, nor a characteristic of systems or institutions; technological frames are located between actors, not in actors or above actors". We find Orlikowski and Gash (1994) more persuasive, who see frames more inclusively as products of socio-cognitive and institutional processes.

Socialization informs actors of their organization's institutionalized logics. Consequently, they will tend to frame new phenomena – including technology -- not naively but through their socialization. Such frames are assumptive in character. Strategic frames may draw on alternative assumptive logics or emphasize different elements of prevailing logics and arise from social

interaction. Strategic framing may be seen in dialectical relation to assumptive frames, and often must resonate to a degree with the latter to be productive in mobilizing coalitions.

Assumptive frames are individually held, inter-subjectively formed aids for organizing/interpreting social reality. They derive from cultural (institutional) logics (Hirsch & Lounsbury, 1997) and are organizationally-structured. Logics constitute meanings, interests, identity(ies), and relational opportunities and make these available to the actor to elaborate (Friedland & Alford, 1991). Actors don't come empty-handed into situations but bring assumptive frames with them; these *priors* inform their evaluation of their own and others' actions on their situational meaning and appropriateness. Assumptive frames constitute an actor's social persona and are an "individual's characteristic". Without engaging the self, it is difficult to account for an actor's relation to strategic frames and, indeed, to other actors: Why are some frames /coalitions more compelling than others?

The notion of frame resonance (Snow & Benford, 1988) may hold a key. Tarrow (1992) elaborates that social movement organizers typically "attempt to relate their goals and programs directly to the existing values and predispositions of their target public…". Organizers "often must operate within the cognitive and evaluative universe that they find rather than create a new one". Committee members backing MIS managers' frame in the present case, for example, took pains to portray it as not inimical to the project's civic networking frame, and of members' dispositions linked to that frame, in an attempt to win converts.

Social movement analysts recognize the role of discourse in cultivating shared frames and social coalitions, both indispensable to mobilizing actors. Institutional entrepreneurs in the present case forged a strategic coalition by skillfully using specific discursive strategies -- identity qualifying and temporal cuing (Mische, 2003) – en route to closure on their terms.

Identity qualifying – indicating "which aspect of an actor's multiple identities and involvements are active right now" (Mische, 2003) – is a strategy actors use to align themselves with particular reference groups. The designers and later, the Urban-net's institutional entrepreneurs relied on such a cue to manage the tension between the project's technological means and social ends. Faced with the impasse over securing subscriber commitments, the designers compartmentalized their technical identity from the social but were careful to note that their technical focus on the backbone was only a temporary shuffling of design priorities. Their technical focus was presented as the necessary means to the project's social aims. This allowed them to segment their identity as technical professionals from the embattled one as facilitators of project's social ends, but without rejecting the latter. Identity qualifying went hand in hand with their temporally-sequenced re-construction of project timeline and a plausible justification of this new narrative intended for relevant key actors. The civic networking frame was a master frame within which they articulated a sub-frame.

The two were similar in structure and content (sharing "common categories" and "similar values on… categories", Orlikowski & Gash, 1994), but the sub-frame featured a local, temporally-cued inflexion, a "necessary" technical design goal: backbone specification.

Their focus shift was a stylistic (rhetorical) shift as well, a shift from discourse on network uses, which was social in its aims, to technical discourse. The designers' discourse was technical in two senses: it was technical in its focus (the backbone). Further, it took on a decidedly technical tone in the way the backbone was characterized. The backbone's data switching capabilities were stressed over its function as an enabler of social inter-connectivity. By talking up the backbone, designers shifted discourse away from network's social applications, which MIS managers saw as expense items to be wary of. The backbone's projected performance was relevant to MIS managers: they were reassured they could save on telecommunications costs without compromising their networks' performance.

Purposively or unwittingly, actors used discourse to divide and differentiate but also to accommodate. The designers' technically-toned discourse disenrolled some actors (CBOs) and enrolled others (public organizations) and decontextualized design discourse from the project's social aims and recontextualized it in technical terms. MIS managers' cost-cutting concern discouraged discourse on network uses that would increase their costs. The cost criterion gave MIS managers an "objective" way to evaluate telecommunications services availed through the project versus the open market. By stripping the project's social agenda from their evaluation, these actors could, and did, publicly relate to the project merely as customers "shopping around for the best deal". This stance enhanced their contextual power with the committee after the revocation ultimatum. Here again, their discourse helped decontextualize the project from its historical /social bases and recontextualize it strictly in bottom-line terms.

Importantly, institutional entrepreneurs as well as dissidents were interested in looking for a new committee organizational form based on mutual accommodation of each group's preferences. The former reassured the latter that the project's normative aims were merely being deferred; a spokesperson said project by-laws could be reviewed after the "crisis" had safely passed to change the committee's orientation to collective benefits. Dissidents' cross-subsidy proposal recognized that the economics of broadband called for new social contractual models where resource-rich could be *required* to subsidize the resource-poor. Both were prepared to be pragmatic in their efforts to institutionalize their preferred arrangements via a revised committee structure and mission; both wished to avoid confrontation and were interested instead in how the present structure and mission could be expanded to *accommodate* a negotiated co-existence while *preserving* interests of each (O'Mahony, 2002).

Conclusion

Cultural ideas shape organizational form and endow it with value. The Urban-net's form as envisaged in the proposal, and the committee structure and mission (as well as its collective interest and identity) were shaped by civic networking ideals. The growing visibility in the U.S. of such ideals in the nineties informed the committee's thinking as well as the way selection committee members conceptualized program-funded networks and their societal benefits. Culture – "shared beliefs and understandings…of a group or society" (Zald, 1996) – penetrates everyday social life and social action that it helps organize via social structures. The political *process* by which cultural abstractions acquire organizational form and are stabilized in a social structure is a specific concern of institutional theory. Analysts have noted the value of relating social constructivist projects to broader culture (e.g., Winner, 1993). Institutional analysts theorize this crucial relation in culture-structure terms both as it plays out within the organization and exogenously – between the organization and its embedding milieu and attend to the dialectical tension between pressures for and against organizational change to explain social constructions and the forms they assume.

An organizational form persists from assumptive aspects of the organizational culture(s) that constrain socialized actors to *order-affirming* actions. The form reproduces itself through actors' taken-for-granted everyday enactments. Culture describes enduring shared elements of organizations, but it can also have a discursive and emergent character (Zald, 1996). Proponents of *order-challenging* action may appropriate culture contentiously as they re-frame shared interests, meanings, and identities and mobilize coalitions for change. Culture thus is implicated in organizational persistence as well as change. Social movement theorizing unpacks the intersection of culture and structure in micro-level framing activity. These insights combined with institutional theory can deepen constructivist analysis. We summarize below the value these add to SCOT ideas.

Social constructivists need to locate groups in structural terms and theorize action on that basis. An outline for such a theory suggested by the Urban-net case covers the following elements. Variation in organizational form is constrained by prevailing macro-structure, which subsumes the potential to reproduce itself in emergent form through, for example, control over resources. By unthinkingly enacting institutionalized role behaviors, socialized actors help reproduce prevailing macro-structure. Actors are also assumed capable of strategic action. They can mobilize new resources in a given structure as they pursue alternatives to the status quo, but whether they prevail or not would depend on their ability to mobilize social coalitions. Macro-structural influence on action is mediated by institutional conditions at the micro-level. Prevailing cultural logics can shape micro-social action. Any setting features multiple, possibly contradictory logics, some more institutionalized than others, and their interaction produces intended

or unintended consequences for emergent form. Actors' role performance can vary with institutional conditions. An actor from a more institutionalized setting will tend to act in institutionalized ways in a new setting, unless the latter features comparably institutionalized logics. These would serve as a countervailing set of considerations to inform his contextual evaluation of what actions qualify as legitimate in it. Institutional conditions can be designed to increase the likelihood that actors will activate certain cultural logics and deactivate others.

As a social construction any artifact, arguably, bears the imprint of *some* RSG. Constructivist views run the risk of functionalist accounting of form: that a technology and its social organization take the form they do to enable designers realize their goals through them. How then would one explain unanticipated outcomes? Organizations do sometimes assume the form their designers intended. But outcomes often also do diverge from institutional designers' intention, as in the present case. This formal variability must be accounted for. It may be explained by analyzing the institutional conditions that warrant *actor-centered functionalist* versus non-functionalist explanation (Pierson, 2000). Conditions in the committee were less institutionalized than in the field and failed to effectively counter particular action patterns expressive of and isomorphic with, institutionalized interests and power in the field. The committee started out with a notion of legitimate organizational form but failed to elicit necessary resources from the field to institutionalize it. The resulting "interaction among intentions" (Goodin, 1996) has been resolved at least for now by fitting the Urban-net to opportunities available in the field. Had the committee instituted conditions consonant with its norm of legitimacy drawn from the civic networking ideal, the resulting form might have been quite different.

"Design" reflects intention and yet, organizational form often is unintended. *Indirect* design is possible: accidents do happen, but their "frequency and direction…can be…shaped by intentional interventions" (Goodin, 1996). Possible interventions designed to increase the likelihood of realizing the project's social aims include two: expanding the committee's managerial capacity and instituting social controls. The first develops from access to new resources and political techniques (Brint & Karabel, 1991). Aligning with cognate social movements with a history of framing issues and mobilizing collective action effectively might be one strategy. Social learning (Pierson, 2000) is another. The committee, for example, could learn from other program-funded projects in the region that managed to support social aims without compromising on project viability and institute similar provisions in the Urban-net project by-laws.

Social controls (incentives/disincentives) can shape what courses of action are pursued. Institutionalizing philanthropic (versus self-interested) behavior by Minneapolis corporations, Galaskiewicz (1991) reports, was helped by "peer pressure and selective incentives of the corporate philanthropic elite"; at the macro- (inter-organizational) level, corporate philanthropic behavior was

rewarded with national publicity via the media. Controls may instantiate the publicity principle, requiring that "institutional action…be…publicly defensible" (Goodin, 1996). Actors are less likely to focalize selfish interests if they are held accountable to a different ethic (Pierson, 2000); this would depend on whether or not institutional actions can be monitored. Insofar as the Urban-net develops as an intra-organizational network (private amenity) tied to powerful stakeholders, monitoring the committee's actions itself would be a challenge. Invisibility, of course, raises the threshold for social control.

Like social movement organizers, institution-builders must mobilize actors sympathetic to their claims. Bijker's (1995) micropolitics centers on technological frames but is silent on coalition-building dynamically through framing. Frames that organize order-affirming conduct must be differentiated from order-challenging frames. The former are institutionalized fixtures of organizational reality and are assumptive in nature; taken-for-granted, everyday actions are shaped by the opportunities and constraints defined through them. The latter are purposive, emergent cultural-political resources dynamically constructed and defined to mobilize and legitimize contentious action. Strategic framing and strategic coalition-formation are linked. It is useful to differentiate groups defined more or less tightly with reference to social categories (such groups may be called *macro-constructions*) from strategic coalitions (*micro-constructions*). Institutional entrepreneurs in the present case micro-constructed a strategic coalition through discourse; they helped institutionalize the strategic frame by fusing it with the committee's organizational base to sustain repeated interaction patterns. Bijker's account of framing is thin both in its institutional (macro-social, assumptive) and discursive (micro-social, strategic) dimensions, and misses the dynamism of their intersection in coalition-building.

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Goals	cross-organizational network infrastructure promoting cross-sectoral connectivity and applications
Key problems	ascertaining who will connect to whom for what applications and resources; applications development-related issues; securing commitment from potential subscribers
Problem-solving strategies	publicizing exemplary uses of broadband; "show-how" demonstrations and trials
Requirements to be met by solution	Serve economically poor and underserved
Current theory	e-government; civic networking; community development approaches
Perceived substitution function	dial-up civic network
Exemplary artifact	operational broadband networks

Table 1. Steering committee's interpretation: Urban-net as a civic network

Goals	specification of network backbone
Key problems	estimating customer demand for access network service
Problem-solving strategies	backbone specification as near-term objective
Requirements to be met by solution	Adequate capacity to meet projected demand
Current theory	public data network design methods
Exemplary artifact	Operational projects

Table 2. Designers' interpretation: Urban-net as backbone

Goals	cost-effective cross-organizational network infrastructure
Key problems	site eligibility for program subsidies, total cost of subscription
Problem-solving strategies	survey, in-house estimates
Requirements to be met by solution	back-compatibility with CPE and on-site technical support staff skills; cost-effectiveness relative to existing services
Perceived substitution function	T carrier leased line services
Exemplary artifact	Gigabit Ethernet service

Table 3. MIS managers' interpretation: Urban-net as intra-organizational infrastructure

Goals	inexpensive high-speed Internet access; CPE upgrade
Key problems	ascertaining total cost of subscription; ascertaining what and how of connectivity; uncertainty over CPE relief amount
Problem-solving strategies	None
Requirements to be met by solution	competitive with Internet access over cable
Current theory	Exemplary use of Internet by CBOs
Perceived substitution function	dial-up connection to Internet
Exemplary artifact	Internet access over cable (DOCSIS)

Table 4. CBOs' interpretation: Urban-net as Internet access ramp