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ABSTRACT

The concept of a community form is drawn upon in many subfields of organizational theory. Although there is not much convergence on a level of analysis, there is convergence on a mode of action that is increasingly relevant to a knowledge-based economy marked by porous and shifting organizational boundaries. We argue that communities play an underappreciated role in organizational theory – critical not only to occupational identity, knowledge transfer, sense-making, social support, innovation, problem-solving and collective action but, enabled by information technology, increasingly providing socio-economic value – in areas once inhabited by organizations alone. Hence we posit that organizations may be in the shadow of communities. Rather than push for a common definition, we link communities to an organization's evolution: its birth, growth and death. We show that communities represent both opportunities and threats to organizations and conclude with a research agenda that more fully accounts for the potential of community forms to be a creator (and a possible destroyer) of value for organizations.

INTRODUCTION

In reviewing how the construct of community has been applied in organizational theory over the past thirty years, it is surprising that there is not much convergence on a common definition, let alone a common level of analysis. In addition to definitions that focus on the geographic demarcations of community (Marquis and Battilana, 2009), organizational scholars have used the term community to refer to intra-firm collectives engaged in knowledge sharing and sense-making (Heckscher and Adler, 2006; Bechky, 2003a,b; Van Maanen and Barley, 1984) as well as to inter-organizational initiatives that cooperate on technical standards and innovations (Tushman and Rosenkopf, 1992; Rosenkopf and Tushman, 1998 Rosenkopf et al., 2001; Hargrave and van de Ven, 2006; Aldrich and Ruef, 2006). The concept of community has been applied to individuals who organize for collective outcomes outside the boundaries of any one organization (von Hippel and von Krogh, 2003 von Krogh et al., 2003; Lakhani and Wolf, 2005; Lakhani and von Hippel, 2003; O'Mahony and Ferraro, 2007) and, at the macro level, provided a critical link in the explanation of the growing connections among social movements and organizations (Davis and Zald, 2005; McAdam and Scott, 2005; Lounsbury, Ventresca, and Hirsch, 2003; Rao, 1998; Davis and McAdam, 2000).

Convergence on a common unit of analysis may not be achievable among such disparate literatures, nor is it our aim. Davis and McAdam suggest that attempting to bound "organizations-as units" may be more "misleading than enlightening" and lead to the wrong types of research questions, questions that will not enable us to make sense of a post-industrial economy (2000: 214). Rather than push for a common definition, our aim is to tie community forms more explicitly to specific organizing processes. Taken

together, several disparate research streams suggest that community forms that share common interests but are not necessarily restricted by a common geography, play a critical and underappreciated role throughout an organization's evolution, contributing socio-economic value both within and among organizations. We define communities as voluntary collections of actors whose interests overlap and whose actions are partially influenced by this perception. Whereas Marquis and Battilana's comprehensive review (2009) shows that, despite globalization trends, local communities have an enduring influence on organizational behavior, our focus is on community forms that operate without shared geography but still exert unexpected influence.

We argue that what may be most critical to furthering theory in this area is to bring a process perspective to understanding the role of communities in a range of organizing processes (e.g., Van de Ven and Poole, 2005; Langley, 1999) such as organizational emergence, growth and death. Rather than create a typology, one way to understand how community and organizational forms inform each other is to examine where these forms intersect by focusing on the verbs implicit in various organizing processes rather than the nouns (Weick, 1974, 1995). This not only avoids the lack of a common unit of analysis problem, but also enriches theory with a more active and dynamic view of the relationships between communities and organizations.

Before doing so, it is worth asking: Why are organizational scholars increasingly drawn to community forms despite this fundamental lack of agreement? As Clemens argues, "the imagery of the centralized, rationalized bureaucracy is increasingly unable to capture the empirical world confronted by organizational analysts" (2005: 352). The mass production, manager-driven economy that emerged after World War II does not fully

account for a shift towards production in unbounded network forms (DiMaggio, 2003 Davis and McAdam, 2000; Powell, 1990) in which the primary driver of value is knowledge instead of material products (Powell and Snellman, 2004). As organizations move away from traditional bureaucratic forms, theorists are increasingly looking to other imageries of social ordering that draw upon "non-authoritative coordination" (Clemens. 2005). Heckscher and Adler argue that it is the "demand for complex, knowledge-based and solutions-oriented production in the modern capitalist economy that has stimulated significant progress towards a new form of community" (2006: 12).

Thus, although there may not be convergence on a level of analysis, there is convergence on a mode of action that embraces collective, small scale, decentralized and lateral organizing processes unbounded by the traditional, well-defined and "countable" units of analyses organizational theorists were taught to embrace (e.g. Scott, 1995). Community forms engage in voluntary collective action organized for a shared purpose that may initiate outside of or adjacent to formal market or state channels (Chen and O'Mahony, 2009: 185). Community action is marked by norms of high trust, reciprocity, relational ties and reputation (Hecksher and Adler, 2006) and lateral authority (Dahlander and O'Mahony, 2009).

Whether this trend is an antecedent or a product of a shift to an economy that relies less upon industrial production and more upon the production of knowledge and services (hereafter post-industrial) (Adler, 2001; Powell and Snellman, 2004; Heckscher and Adler, 2006) may not much matter. Historical studies have convincingly shown that communities have always been an important form of collective and even economic action (e.g., Allen 1983, Schneiberg, King, and Smith, 2008; Marquis and Lounsbury, 2007). As

the permanence and relevance of traditional organizational boundaries have been challenged by globalization, political fragmentation and decentralization and affordable networked information technology (Yates and van Maanen, 2000 Davis and McAdam, 2000; O'Mahony and Barley, 1999), we argue that community forms have become no longer a side dish, but an entrée on organizational theory's main menu.

In our attempt to synthesize disparate streams of research on communities, we suggest that organizations may live in the shadow of communities as opposed to vice versa. A growing body of empirical research suggests that communities are critical to organizational evolution through (1) the genesis of new organizations, (2) mediating the performance and growth of organizations, (3) posing competitive threats to organizations, and (4) outliving organizational death. We argue that examining these organizational processes without considering the effects of community will render any analyses incomplete. After offering a working definition of community forms, we review empirical research on how community forms affect organizational processes as well as the threats they may pose to formal organizations. We conclude with some ideas about how to leverage this emerging body of knowledge and inform its future direction.

Community Forms in a Post-Industrial Economy

Community forms have a long and rich history as a mode of organizing, as evidenced in the sociological literature on communes, co-operatives, community-based organizations and social movements (e.g., Swidler, 1979; Rothschild and Whitt 1986; Simons and Ingram, 1997; Marwell 2004, 2007). We are not the first to note the lack of a consistent definition of the term "community" in both sociology (Brint, 2001) and

organizational theory (DiMaggio, 2003). In sociology, the term has been used at least 94 different ways (Hillery (1955) cited in Brint, 2001). Brint judges the community studies tradition in sociology to be a failure, arguing that the field has been stuck at the descriptive level and failed to develop generalizations about human social behavior within communities (2001). To rescue the concept, Brint (2001: 8) offered a generic definition of communities as "aggregates of people who share common activities and/or beliefs and who are bound together principally by relations of affect, loyalty, common values, and/or personal concern (i.e., interest in the personalities and life events of one another)."

However, Brint's emphasis on affect, loyalty and personal involvement can exclude communities that share an instrumental or rational interest orientation. Using Merton's notion of a "scientific community" ([1942]1973), Jochen Gläser (2001) offered a definition of community that explicitly included an instrumental orientation. Modifying Gläser's definition, we define community as "a voluntary collection of actors whose interests overlap and whose actions are partially influenced by this perception." Actors, in this sense, is a term broad enough to include both individuals and organizations, which, albeit inclusive, raises critical questions when it comes to research design. Actors' participation is voluntary and of their choosing, but actors need not be volunteers (e.g., Dahlander and Wallin, 2006). A strength of this definition is that it includes both relational and instrumental motivations and acknowledges that, like any social structure, communities can both constrain and enable individual action. This definition does not presume to define the nature of the locale (geographically constrained or not) that will be

relevant to an actor's sphere of influence, nor does it require all cultures, norms and practices to be fully held in common; shared interests that affect behavior are enough.

Traditional notions of community like *Gemeinschaft,* rely on highly structured, stable ties that socialize members to act in accordance with the expectations of others. Granovetter critiques this conception for its "oversocialized" view of action (1985). The *Gesellschaft* conception of community relies on less socialization and fewer rules with the expectation that people will act in accordance with their interests. Heckscher and Alder (2006) navigate between these two concepts, arguing that neither captures post-industrial community forms. Their notion of "collaborative communities" avoids both overly positive and overly pessimistic conceptions of community by acknowledging, without bowing to, the interdependence of community members (Heckscher and Adler, 2006). Collaborative communities display (1) a shared ethic of interdependent contribution, (2) a "formalized set of norms of interdependent process management," and (3) an interactive social character and identity (Heckscher and Adler, 2006: 2).

Thus, post-industrial conceptions of community forms have shifted from a "local" notion of collective action that arose with the 1960s counter-culture movement to embrace a more limited form of community dependent on shared contributions and a shared identity within a narrowly defined domain. A narrowly shared domain likely fosters the sustainability of community forms. Historically, community managed organizations have not enjoyed a high rate of survival (Kanter, 1968; Rothschild-Whitt, 1979; Swidler, 1979; Rothschild and Whitt, 1986; Simons and Ingram, 1997) as the domains of social life relevant to the collective were all encompassing. For example, to effectively participate in a food cooperative, individuals needed to not only share the

values of the group, but also maintain eating and grooming behaviors that reflected those values (Rothschild and Witt, 1986). Post industrial community forms focus on shared contributions, knowledge and learning without placing such demands on their members. Their narrowly shared domain and a spatial character allows more individual differences to coexist. This can help to diffuse and prevent the types of internal conflicts that historically contributed to the demise of collectivist organizations.

Community forms began to be taken seriously by organizational scholars when van Maanen and Barley (1984) argued that occupational communities could be an important unidentified source of variance motivating behavior and performance within organizations. Since then, community forms have been found to foster knowledge (Bechky, 2003a, b; Brown and Duguid, 1991, 2001), innovation and problem solving (Lakhani and von Hippel, 2003; von Krogh et al., 2003; von Hippel, 2005; Lakhani and Panetta, 2007; Hargrave and Van de Ven, 2006), standards setting (Fleming and Waguespack, 2007; Rosenkopf et al., 2001), social exchange and support (Wellman et al., 1996) and even economic value, spurring voluntary and financial investment in some of the largest online communities in the world (e.g., Wikipedia (Lakhani and McAffee, 2008) and Facebook (Piskorski et al., 2010)).

These forms of communities deviate from traditional conceptions of community in that they are bound not by geographic territory but by shared relational exchange and identity (e.g., Hsu and Hannan, 2005). Although some scholars have (prematurely) mourned the demise of communities that are proximate and spatially connected (Putnam, 2000), this loss may be complemented if not supplanted by new forms of communities (e.g., Mok, Wellman, and Carrasco, 2010) that rely on shared information platforms to

organize and act on common interests across time and space (Melucci, 1999). Networked information technology, like geographic proximity, can reduce transaction and organizing costs by connecting disparate people in ways that would be impossible in its absence (Shirkey, 2008). Yet, we caution against overstating this effect. Although scholars were once entranced with the unbounded power of "online communities," the reality is that successful, mature online communities are often complemented by face-to-face interaction in social forums not unlike their traditional local counterparts (O'Mahony and Ferraro, 2007; Fleming and Waguespack, 2007). Spatial proximity may no longer be a necessary condition for the creation of community forms, but we do not want to argue that opportunities for proximate social exchange is immaterial to the growth or success of such communities.

Post-industrial community forms also differ from traditional conceptions of community in the nature of their activity. Communities have always engaged in political and civic action and public service, and enabled industrial cooperation, in well-defined critical arenas (Marquis, Glynn, and Davis, 2009). Community forms in a knowledge economy often work towards both large and modest goals, making micro contributions in an on-going way through the creation, exchange, revision and recombination of shared knowledge in domains that extend from software to encyclopedia entries, recipes, artwork, photos, songs, videos, medical diagnosis, economic development, scientific problem-solving and patent research (e.g., von Hippel, 2005; Lessig, 2008; Lakhani and Panetta, 2011; Boudreau and Lakhani 2009; Seidel, this volume). Whereas some communities relish commercial activity (O'Mahony and Bechky, 2008; Shah and Tripsas,

2007; Lakhani and Panetta, 2011), others, such as the Burning Man community, resist it (Chen and O'Mahony, 2009).

However, few frameworks enable us to make sense of these distinctions and the productive, creative and innovative actions that take place within community forms. Much of the work on social movements and collective action has focused on how communities mobilize as a form of resistance (e.g., Gamson, 1975) as opposed to creation (O'Mahony and Bechky, 2008; Rao, 2008). Despite the proliferation of community forms engaged in more than protest, learning or sense-making over the past decade, organizational scholars have only begun to examine how traditional assumptions of community are challenged by these forms, and how communities are affecting traditional organizational processes.

To further a coherent research agenda along these lines, we draw from seven literatures (Table 1) to identify how community forms affect common organizing processes and pose both threats and opportunities to formal organizations. Although a typology of the ideal "C form" organization is helpful (Seidel, this volume), our collective research suggests that a process perspective on how communities and organizations influence each other may illuminate some perplexing theoretical problems for organizational theory like explaining organizational emergence (Chen and O'Mahony, 2009; Rao, Morrill, and Zald, 2000), technological and industrial change (Hargrave and Van de Ven, 2006) and variation in organizational performance. In doing so, we depart from traditional evolutionary approaches (Aldrich and Ruef, 2006) with a grounded comparative perspective (Aldrich, 2009). We conclude with a research agenda that more

fully appreciates the contribution community forms make to organizational life and theory.

Linking Communities to Organizational Processes

We next explore how communities contribute to four common organizational processes: (1) the emergence of organizations, (2) the growth and performance of organizations, (3) organizational competition, and (4) the death of organizations. Within these four areas communities contribute to many micro-processes, but for purposes of illustration, we select only a few examples.

1) Communities help organizations emerge. Scholars at the intersection of social movements and both organization theory and entrepreneurship have noted the ways communities and social movements can stimulate the creation of new organizations and new organizational forms (Rao, Morrill, and Zald, 2000). Rao and colleagues argue that constructing new organizational forms is a political project that involves collective action, and is most likely to emerge when actors are excluded from conventional organizing channels or when "normal incentives" or market mechanisms are inadequate (2000). In this sense, communities are latent or unidentified independent variables that help produce new organizational forms as dependent variables (e.g., consumer advocacy organizations (Rao, 1998) or alternative dispute resolution organizations (Rao, Morrill, and Zald, 2000)).

What is less appreciated is that communities focused on apolitical interests can also instigate the production of new organizations, forms and even markets (Rao, 2008). What binds these entrepreneurial communities is not necessarily political or civic

concerns, but a shared passion for producing goods or services that are not plentiful in the market. For example, when home brew enthusiasts discovered how many others shared their interest in craft brewed beers, and realized the market opportunities to be explored, they became entrepreneurs, spurring the creation of the craft brew industry (Carroll and Swaminathan, 1998; Wade, Swaminathan and Saxon, 1998). Craft brewers were disenchanted with the generic taste of industrial mass produced beers and celebrated fresh ingredients, authentic techniques, small batch production and a wide variety of flavors. They engaged in collective action, creating new organizations like the Institute for Brewing Studies and American Home Brewers Association to advance their interests.

In the same manner, gourmet coffee enthusiasts' love for specialty and exotic coffee transitioned into the creation of new organizations, firms and, eventually, a new field when they began to realize that others shared their appetite for full bodied, specialty roasts unavailable in the market at the time (Rindova and Fombrun, 2001). The infamous home brew computer club was a hobbyist club composed of individuals who wanted to build new hardware and share and refine computer programs at a time when computer programs were in short supply and the average person couldn't afford to buy a computer (Levy, 2001). The founder of the home brew club stated that the purpose of the club was to foster collective learning through the exchange of information: "information should pass freely among the participants" (Levy, 2001: 213). Many credit this club's early dissemination of technical knowledge with the spawning of the computer industry in Silicon Valley.

In all these cases, the actors creating new organizations, and sometimes entire new industries, were entrepreneurs acting not alone but within robust communities that

facilitated information exchange, feedback, experimentation, prototyping and learning. Institutional entrepreneurs (e.g., DiMaggio, 1988) may be important in helping to "define and justify, and push the theories and values underpinning a new form" (Rao et al., 2000: 243), but theorists should caution against granting institutional entrepreneurship too much weight. Although social skill (Fligstein, 2001) may help in leading activities that inspire new organizations, fields and even industries, the earliest steps often involve building communities.

For example, Robert Mondavi purposefully created a community of vintners to build a market for artisan craft, as opposed to jug, wines (Lukacs, 2000). When Mondavi realized that oak barrels provided some of the complexity found in French wines, and enabled the production of artisanal wines on a large scale, he imported all that he could to the United States. Instead of keeping the extra barrels, Mondavi sold them to competitors with whom he worked to popularize the technique by experimenting and sharing knowledge of the production process throughout the region (Lukacs, 2000). Mondavi had no reservations when those who learned from him initiated their own operations and entrepreneurial ventures. He was focused on growing a community as a means to build a market, and vintners founding new businesses were a key enabler of that objective.

Communities can be the genesis of new forms not only in new and emerging fields and industries, but in established ones as well. Shah and Tripsas (2007) found that new parents often became "accidental entrepreneurs," founding firms somewhat reluctantly only after discovering unmet baby product needs about which they felt passionate enough to address them in the mature industry of baby products. A growing body of research finds that user-entrepreneurs will commercialize a product or service

they use only if they are convinced that it will be appreciated or valued by others in the community in which they participate. Community participants and collaborators who become entrepreneurs in this sense are not necessarily interested in launching and managing a venture or leading an institutional project. Rather, they do so for the sake of advancing their community's knowledge or capabilities (Shah and Tripsas, 2007).

Similarly, not all community organizers found organizations in the hope of creating a new field or industry. Some build organizations only reluctantly in order to protect collective interests. For example, although both open source programmers and Burning Man enthusiasts valued their volunteer, autonomous and flexible organic modes of production, members of both communities found it necessary to create new organizations to protect and defend interests that scaled significantly and faced new challenges (Chen and O'Mahony, 2009; O'Mahony and Bechky, 2008; O'Mahony 2003). Government and environmental regulators pressured the Burning Man organization to adopt more traditional practices and forms, and proprietary software firms pressured open source software projects to adopt more formal organizing structures, but neither community bowed completely to these pressures (Chen and O'Mahony, 2009). Instead, they selectively synthesized traditional corporate structures with their native community practices and processes to create new organizing models (O'Mahony and Chen, 2011.

The examples cited here have attracted attention from very different literatures including social movement theory, organizational ecology, institutional theory and user innovation studies. Each has brought a slightly different focus and investigating these communities in light of their own research traditions. While ecologists have been more interested in the conditions that foster the creation of unique market niches, user

innovation scholars have been fascinated with the ingenuity and inventiveness of individuals who lack the resources and constraints associated with a firm. What has attracted social movement and institutional scholars is exploring how those who lack power and resources are able to achieve social innovations that further their interests; while innovation scholars have focused on uncovering the sources of innovative new products and services.

Yet, upon closer examination, a common thread can be found. Members of all these communities shared an interest in the subject matter and a desire to share their experiences, learn from each other and push the frontier of existing knowledge. In the coffee, beer, open source, Burning Man and baby product communities, members met to share ideas and learn from each other and were able early to identify unmet needs in established industries. The early computer and wine communities were formed by individuals who wanted to push the frontier of knowledge that existed at the time and accelerate mutual learning. “By sharing our experience and exchanging tips we [the home brew club] advance the state of the art and make low-cost computing possible for more folks” (Levy, 2001: 213). These communities met regularly to fill a knowledge vacuum and advance the state of their fields of interest.

Rather than merely demonstrate social skill, these examples emphasize the discovery of new innovations and process techniques; organizations emerged from the efforts of communities to create and disseminate new products produced from the learning shared through community exchange. All these literatures embraced the notion of community forms as critical to the introduction of novel ideas that ran counter to entrenched or incumbent interests, without necessarily explicating the microprocesses

that enabled the communities to have an impact. That communities contribute to the genesis of organizations may not be a difficult argument to make, but because organizational theorists often begin with organizations as a starting point, these processes are too often missed. What is not well understood is how the boundaries of communities and organizations are redrawn and contested over time as markets and industries grow (e.g., Ferraro and O'Mahony, forthcoming). Communities vary in their response to the emergence of organized interests (e.g., Chen and O'Mahony, 2009), yet we have few frameworks for explaining how communities are affected by entrepreneurial and field building activity. The home brew computer club did not survive the transition to commercial organizations, but the open source software and Burning Man communities did. What is missing is a framework that explains what types of community actions lead to the emergence of a field, and how communities are affected by this type of entrepreneurial activity.

2) **Communities mediate the performance and growth of organizations**. Communities don't just inspire new organizations, they also mediate organizational performance through their effect on organization members' ability to engage in information and knowledge sharing, learning, socialization, problem solving and innovation. The literatures on communities of practice and collaborative communities examine communities that collaborate in the service of organizational goals, although they may operate outside of formal organizational structures (See Table 1). These communities are formed within the framework of work place activity, and their intent is often to overcome organizational rigidities, foster the acquisition and sharing of non-canonical knowledge and overcome technological knowledge gaps, all of which can

affect firm performance. Next, we consider how communities mediate performance at both the organization and field level.

Organization level. The concept of communities of practice originated with Lave and Wenger's exploration of alternatives to formal, school-based learning theories (1991). They consider learning to be a social practice that occurs within the everyday activity of a community; "learning," they observe, "is not something about digestion of facts, rather it, along with thinking and knowing, are constituted in relations among people who are engaged in activity in the socially and culturally constructed world" (Lave and Wenger, 1991: 51). By participating in a community of practice, individuals learn "the ropes" of a particular occupation (e.g., how to be a butcher) or how to manage and make sense of interdependent work activities (e.g., navigating a ship).

A community of practice is not equivalent to or synonymous with a group, team or network, but is instead defined on the basis of three dimensions, (1) mutual engagement, (2) joint enterprise, and (3) a shared repertoire (Wenger, 1999: 73). These dimensions are not independent; they reinforce and constitute each other to form the basis of community. Mutual engagement implies that individuals in a community are continuously engaged in actions the meanings of which they negotiate with one another. Mutual engagement around a joint enterprise entails not just accomplishing the canonical work, but also creating meaning and a sense of belonging. Pursuing joint enterprise builds a shared repertoire among community members that includes "routines, words, tools, ways of doing things, stories, gestures, symbols, genres, actions, or concepts that the community has produced or adopted in the course of its existence and which have become part of its practice" (Wenger, 1998: 83). The empirical basis for the communities

of practice literature is founded on studies of relatively stable occupations and professions (e.g., butchers, tailors and insurance adjusters). Thus, the focus is often on enabling a newcomer to become part of an existing community and its practices, in essence, reproducing existing practices (Osterlund and Carlile, 2003). In this manner, communities mediate performance by helping firms more efficiently and accurately accomplish common human resource objectives like socialization and training.

Communities of practice also mediate firm performance by facilitating flows of knowledge and solve problems that would otherwise be hampered by organizational rigidities (e.g. Bechky, 2003a, b) and improve the quality of products and services. In large corporations like IBM, the challenge is how to disseminate knowledge and practices across complex organizational structures. “IBM’s president Thomas J. Watson Sr. was initially hostile to the idea [of a user association] but his resistance was overcome with the possibility that a user group might alleviate the programming bottleneck” (Campbell-Kelly, 2004: 32). Communities in this sense are a lubricant for the dissemination of practices that can improve firm products. For example, Bechky shows how semi-conductor assemblers and engineers worked to achieve a common understanding across the disparate languages, practices and examples maintained by their distinct communities (2003b). Absent the ability to translate and transform each community’s basis of technical expertise, misunderstandings led to faulty machine designs. Only by working across these differences could complex interdependent technical problems be solved and the quality of the firm’s products improved.

Communities of practice mediate organizational performance by fostering the acquisition and dissemination of non-canonical knowledge (Brown and Duguid 1991,

2001). Drawing on Bourdieu (1990), Brown and Duguid (2001) show that by engaging in collective problem solving community members learn from modus operandi (the way a task appears in progress) as opposed to deconstructing opus operatum (what is visible after the task is finished). Orr's (1996) ethnography of Xerox repair technicians shows how communities of practice enhanced learning and technical problem solving within an organization. By creating and sharing narratives about problematic photocopiers and customers, Xerox repair people used narration to integrate facts about problems via storytelling. Stories connected the individual and collective memories of repair people with various tests and machine diagnostics such that a diagnosis and repair could be made. Through ongoing conversations within the community, these stories become collective repositories of knowledge about what it takes to repair machines. Stories about machines, people and techniques evolved as actors and machines changed, unlike the static, canonical knowledge provided by Xerox repair manuals and headquarters support, which were seldom drawn upon for common problems.

This context shifted the focus from practices that were merely reproductive (stories that assimilated new technicians) to practices that were also productive (stories that produced novel problem solving). Although this study had enormous impact on the field, little research has replicated or extended these results to other types of technical work, despite the fact that this job category is experiencing enormous growth. As Bechky rightly notes: "(O)ur field knows more about the details of photocopy repair than almost any other type of technical work. While it is helpful to know what copy-repair technicians do, there's a whole lot of technical and knowledge work out there waiting to

be explored" (2006: 1765). Our guess is that communities can be relevant to mediating performance in a wide variety of settings, but a few studies carry disproportionate weight.

Field level. Organizational performance can also be mediated by participation in inter-organizational technical communities that affect an organization's ability to learn from competitors, evolve products in line with technical standards, innovate and form alliances (Allen, 1983; Van de Ven and Garud, 1989; Tushman and Rosenkopf, 1992; Rosenkopf, Meitu, and George, 2001; Garud, Jain, and Kumaraswamy, 2002; Fleming and Waguespack, 2007). Technical communities are inter-organizational constructs that operate at the field level and are composed of individuals, regulators and firms organized to pursue common goals like establishing technical standards and pursuing innovations within an industry (see Table 1). Firms that participate in these types of communities inevitably do so for strategic reasons, but this mode of collective action shares some commonalities with other types of communities in that the collective action is organized by technical experts collaborating with one another outside of an organization's formal reporting channels.

Participating in technical communities at the field level is often necessary for firms that produce goods or services that depend on common standards or materials or that compete against field level alternatives. Garud et al (2002) show how Sun Microsystems created a community to help evolve its Java technology and challenge the dominance of Microsoft's Windows. Sun built a community of assemblers, software firms, hardware manufacturers and programmers, entered into numerous licensing agreements and courted international standards associations to foster consensus on Java technology as a standard. Firms like Microsoft and Hewlett Packard resisted these efforts,

questioning whether Sun was acting in its own best interest or in the best interest of the collective it had so actively formed (Hargrave and Van de Ven, 2006).

Hargrave and Van de ven compare communities at this level of analysis to social movements trying to foster "a synthesis of new institutional policies and structures [that] emerges from conflict and contestation among colliding groups" (2006: 855). Clearly, firms only engage in technical communities at this level to serve their own interests, but that does not mean they control the outcomes, which are the product of interdependent partisan actors striving to create new institutions to support their innovations (Hargrave and Van de Ven, 2006). This type of collective action is generated when there is "recognition of an institutional problem, barrier, or injustice among groups of social or technical entrepreneurs" (Hargrave and Van de Ven, 2006: 867). It is most often individuals in key brokerage or boundary spanning positions that move between technical communities and the organizations they represent (Dahlander and O'Mahony, forthcoming; Fleming and Waguespack, 2007; Dahlander and Wallin, 2006; Rosenkopf et al., 2001) on specific projects. In this manner, firms work together on technical challenges relevant to others in their field to advance a body of knowledge in service of innovation. Participation in these communities enables a degree of sharing, exchange and accumulation of knowledge among firms that would be difficult to achieve through more formal means (Murray and O'Mahony, 2007), but the ultimate effect on performance depends on whether a firm's contribution to a collective technical project enhances or impedes the firm's goals.

3) Communities can pose competitive threats to organizations. Whereas much of our analysis has focused on the positive inter-relationships among organizations

and communities, some communities, despite their relative lack of power and access to resources, yield negative consequences for organizations. In this context, communities are not necessarily mediating organizational performance through their effect on processes critical to the firm, but rather posing a competitive threat through external processes that directly challenge the firm's goals. Social movement scholars, have since the early twentieth century, documented how collectives attempt to redress social and political grievances through actions against established organizations. Early explanations of communal behavior were rooted in the irrationality or "madness" of crowds prone to act in violent ways and subject to rumor and panic (le Bon, 1895). Jasper's (1997) critique of the "crowds" research paradigm notes the lack of direct empirical observation to support these claims, but credits the tradition with identifying the importance of social strain and role of deviants and enduring relationships as drivers of social change (e.g., McAdam, 1990; McAdam and Paulsen, 1993).

The current dominant theoretical perspective on collective action is that it is ultimately driven by access to resources or resource mobilization (McCarthy and Zald, 1977). With access to material resources, the mechanics of protest (e.g., bussing and feeding people, protest signs, and even career progression for die hard protestors) can be provided and potential barriers to participation eliminated. Social entrepreneurs able to raise funds from disaffected elites and channel those resources to their cause enabled civil rights activists to be more successful in meeting their goals of social and political change (McAdam, 1990). But the success of collective protest is contingent upon "political opportunity structures" (shifts in the actions or belief systems of targeted populations or organizations) that provide an opening for further change (McAdam et al 1996; Tarrow,

1988). Thus, protest alone may not be enough to pose a competitive threat; the opportunity structure may also have to change in order for protesters to gain traction and achieve their preferred reforms.

For example, local community groups rallied for anti-chain store legislation at the state level to protect the business of independent retailers (Ingram and Rao, 2004). But these laws were often short-lived as anti-chain laws were repealed at the national level under pressure from chain store lobbyists, agricultural cooperatives and unions (Ingram and Rao, 2004). Lacking greater coordination at the national level, community action in the face of chain stores' nationally organized strategy was effective only in the short term (Ingram and Rao, 2004). Further analysis shows that chain stores like Wal-Mart were likely to withdraw from new markets that triggered community level protests, particularly when such protests were interpreted as a signal of future problems (Ingram, Yue, and Rao, 2010). Yet, when stores were viewed as being particularly profitable, uncertainty over protesting behavior was less likely to impede Wal-Mart's strategy (Rao et al 2010). Thus, communities can pose a competitive threat to organizations by making it difficult if not impossible for them to thrive (King and Soule, 2007) or grow their operations (Ingram and Rao, 2004), although these effects are likely to be contingent.

Communities also pose threats to organizations by founding countervailing organizations and providing competing goods and services (Marquis and Lounsbury, 2007). For example, Marquis and Lounsbury found that local banking professionals founded new community based banks in the wake of out of town bank acquisitions (2007: 813). They argue that this activity was inspired by community logics of local control bent

on resisting and countering the encroachment of centrally owned and controlled banks (Marquis and Lounsbury, 2007).

At a micro level, communities can be competitors to organizations by collectively producing competing products and services. For example, the aim of the Free Software Movement founded by Richard Stallman in 1985 was to create software that would be distributed for "free" to compete against organizations that sold commercial (and closed) versions. The political objective of the community was to create an alternative ecosystem of products that would not be proprietary, but rather always available and modifiable by any user. These community members effectively organized not to protest, but to create solutions that would target the revenue streams of organizations not politically aligned with the movement. A faction broke from this movement to reframe the work and court commercial allies (O'Mahony and Bechky, 2008). Recalled a founder of the new open source movement:

> People could not identify with the word "free software"; it was too scary. People needed less confrontation and a less political term. It was dragging us down…. [T]he term free software sounds really good to an idealistic, shaggy haired hacker in Birkenstocks, but it scares the crap out of Jay Random in Techio. We were making basic mistakes like not adapting our language to our target audience. (A participant in the February and April 1998 free software reframing meetings, cited in O'Mahony, 2002)

Community members were deliberate in their efforts to transition from software used only by hackers to software robust enough to be used in commercial enterprises. The term "open source" was chosen specifically to emphasize the pragmatic benefits of open and available source code and abandon the moral position of pursuing free code for its own sake (O'Mahony, 2002).

Within six months, the dominant firm in the software industry, Microsoft, referred to open source software as a "direct, short-term revenue and platform threat…and a larger developer mindshare threat" (www.opensource.org/halloween). In defending anti-trust charges, Microsoft actually cited the success of the open source community as evidence of competition in the software industry (*US vs Microsoft*). After 25 years, the original objectives of the free software community—to create an alternative ecosystem of open and free software products that would be compatible with proprietary products—has been more than successfully met. For example, more than 60% of all publicly accessible Web sites on the Internet use open source Apache software, ahead of Microsoft Internet Information Server at 26% (Prettejohn, 2001). The open source Linux operating system commands 26% market share in the computer server operating system market, second only to Microsoft's 45% share (Gillen and Kusnetzky, 2000). In every single major category of software, there exists a free and open source community produced version that directly competes with a proprietary software product. Thus, community produced alternative goods siphon revenues and customers from established organizations in the business of selling software (e.g., Baldwin O'Mahony, and Quinn, 2003).

This community based mode of production gives new meaning to Lave and Wenger's notion of joint enterprise, as contributors write code for their own use, share it with others and collectively contribute to the development and improvement of software (von Hippel and von Krogh, 2003) that will always remain accessible to them (O'Mahony, 2003). More than 2.7 million individuals contribute to in excess of 270,000 distinct software projects (sourceforge.net). Participation in the open source community can be explained by examining both extrinsic motivations (Lerner and Tirole, 2002) and

intrinsic motivations oriented to the joys of participating in a fun activity (Lakhani and von Hippel, 2003; Lakhani and Wolf, 2005). Participation is driven by individuals' own preferences for alternatives to proprietary software that can only be met through their direct involvement in the community's production of free, open source software (Lakhani and Wolf, 2005; Roberts et al., 2006).

Community based production of goods presents direct competition to organizations in industries other than software. Wikipedia, the online encyclopedia, is perhaps the most successful and widely known example of community produced work that challenges work done profitably by formal organizations such as Encyclopedia Britannica and Microsoft Encarta (Lakhani and McAfee, 2007). Comparative analysis of article entry quality has found error rates to be only slightly higher for Wikipedia than for Encyclopedia Britannica (Giles, 2005). Wikipedia's rise has been driven by more than 300,000 volunteer contributors, each of whom has made at least 10 changes to the encyclopedia, and a few full-time systems administrator employees of the non-profit Wikimedia foundation (Lakhani and McAfee, 2007). By the end of June 2006, Wikipedia had accumulated 4.2 million articles totaling 1.4 billion words in 250 languages (Lakhani and McAffee, 2007).

With the advent of low cost software tools, increased connectivity and the spread of computer knowledge and skills among younger generations, it is likely that far flung communities will be able to produce more types of information goods that present new competitive challenges to traditional organizations. What is not clear is what conditions will enable communities to not only recruit contributors, but also scale and coordinate their efforts to achieve a competitive impact. Many open source software communities do

not get past the incubation stage, and fail to recruit more than one or two contributors (Healy and Schussman, 2003). Governance challenges, if unresolved, can inhibit the growth of community based production (Ferraro and O'Mahony, forthcoming; O'Mahony and Ferraro, 2007; O'Mahony, 2007).

In the spirit of resource mobilization, one way in which community produced software achieved enterprise quality was through collaboration with established firms like IBM (Baldwin et al. 2003; O'Mahony and Bechky, 2008). Firms like Google and HP also hire boundary spanners who actively contribute software code to community projects while simultaneously working towards firm goals (e.g., Dahlander and Wallin, 2006). Even as communities and firms identify areas for co-production that are mutualistic, how these boundaries are managed continues to be an on-going challenge that is under theorized (O'Mahony and Chen, 2009).

4) **Communities outlive organizations.** Sutton noted that organizational death occurs when "participants agree that the organization is defunct, and the set of activities comprised by the dying organization are no longer accomplished intact" (1987: 543). Organizational death includes a variety of conditions including legal death (i.e., shutdown), bankruptcy and reorganization and merger with or takeover by another firm (Walsh and Bartunek, 2008). For example, the recent recession led to the death of a great many organizations that once employed newly minted MBAs. The consequences of such death are felt by both employees and customers, and can trigger the creation of communities that help members make sense of these events or sustain valuable elements of their organizational life (Walsh and Bartunek, 2008; Muniz and Schau, 2005). For example, communities and social networks like LinkedIn support the emergence of

occupational and corporate alumni communities that survive long after members' employing firms have died. The community creates a venue in which professionals can connect with other, similar professionals and build outside options for future career mobility. At the same time, LinkedIn is a business that leverages the career information professionals disclose to charge corporate recruiters who want to search for prospective hires (Piskorski, 2009).

The creation of communities for grieving in the wake of an organizational death can even lead to the birth of new organizations (Walsh and Bartunek, 2008, forthcoming). Walsh and Bartunek theorize that because individuals in modern societies often construct their identities in relation to their work, a traumatic experience like an organizational death triggers individuals to create structures that preserve the legacy of the organization in order to preserve their own individual identities (2008). In his study of the defunct Digital Equipment Corporation (DEC), Walsh (2009) found that in order to preserve relationships and artifacts (tangible and intangible) collectively produced by DEC, former employees who strongly identified with the company formed alumni associations and museums after its demise. Former DEC employees labored extensively to collect and archive physical artifacts like products and manuals in formal and informal museum settings to preserve their identities and the organization's legacy (Walsh, 2009; Walsh and Glynn, 2008). Hence, organizational identity can outlive the organization itself through the creation of communities aiming to sustain it (Walsh and Bartunek, 2008).

Communities don't just outlast organizations; they can also extend the life of the products organizations create. Muniz and Schau (2005) show how a quasi-religious community of Apple Newton users coalesced and self-organized into various online

forums after Apple discontinued the product five years after its introduction in 1998. Instead of accepting the death of the Newton, diehard Newton users engaged in activities typically assigned to the firm including modifying, repairing and creating new enhancements for the dead product. They created new marketing messages, promotions and consumer-to-consumer interaction scripts to bind the community of believers still using the Newton. As von Hippel has shown, users often innovate above and beyond the capabilities that manufacturers provide (1998), collaborating in communities to create alternative products and services (Lakhani and von Hippel, 2003; von Hippel, 2005), but steadfast work on defunct products and services shows how community forms can transcend organizations. Even if the creating organization has expired, communities of users can develop collaborative relationships that are mutually beneficial and sustain and evolve the legacy of the product vision, even evolving products abandoned by their organizations.

For example, the Mozilla community, once left for dead by AoL/TimeWarner, experienced a dramatic rebirth with the launch of the Firefox browser. When Netscape released the Mozilla browser's source code in 1998, its aim was to save the company. This strategy failed when Netscape was acquired by AOL and later merged with Time Warner. Yet the community of thousands of code testers and contributors continued to thrive,– going so far as to streamline the code with the release of Firefox (originally called "phoenix") (O'Mahony and Raj, 2007). After AoL/Time Warner spun the Mozilla project off into its own nonprofit foundation, community members later created a for profit holding company. As a result, many software developers in the Firefox community have worked for at least five different employers (Netscape, AoL, Aol/Time Warner, the

Mozilla Foundation and the Mozilla Corporation) on a single software project, the Firefox browser (O'Mahony and Raj, 2007). Throughout this series of organizational machinations, the community steadfastly kept the Mozilla/Firefox browser alive, revamped it and grew its market share from 3% to almost 25% (O'Mahony and Raj, 2007). The only browser to have more market share now is Microsoft's Internet Explorer. In this case, the community form was more robust than any organization, despite millions of dollars of investment in the companies that previously owned Mozilla. This particular example may be well known, but its lessons have not been adequately mined. We know little about the practices, processes and mechanisms that enable a community to sustain and grow a project long after an organization abandons it.

Defining a Research Agenda

In this review, we have incorporated illustrative examples to demonstrate how communities contribute to four organizational processes, (1) inspiring the genesis of formal organizations, (2) mediating the performance and growth of organizations, (3) competing against formal organizations, and (4) outliving the death of organizations. Given their prevalence in organizational theory, it is surprising that the relevance of community forms is at all debated. In a sense, community forms have been an omitted variable in many organizational theories. We suspect that this is largely because research on community forms has remained embedded in specific subfields with little theoretical conversation among subfields. We have argued that a research agenda that explicitly links community actions to organizing processes will enhance the explanatory power of existing theoretical frameworks. In addition, there are many unanswered questions that

the existing literature does not begin to address, such as the relationships developing between community forms and emerging business models.

Communities and Emerging Business Models. Many firms are designing business models that depend on community forms of production. For example, Threadless, the Chicago-based, online T-shirt retailer has amassed a community of more than a million members who actively participate in creating economic value for the firm (Lakhani and Kanji, 2007). Threadless members submit t-shirt designs to be critiqued and evaluated, members vote on the best designs and Threadless executives pick the designs to print. The community provides the art and ideas, with the company undertaking production and marketing activities. Threadless earned in excess of $23 million in revenue in 2007. In this partnership, the firm (1) provides a platform on which the design community collaborates, and (2) manages order fulfillment. Has the firm outsourced its design work? Or has the community outsourced production? The firm profits handsomely, and the community remains loyal and continues to grow. Yet the ramifications of this distributed model of capitalism, for communities or organizations, are not well understood.

Other business models like TopCoder (Lakhani, Garvin, and Lonstein, 2010; Boudreau, Lacetera, and Lakhani, 2011) and InnoCentive (Lakhani, 2008; Jeppesen and Lakhani, 2010) depend on platforms to build communities for solving sophisticated scientific and technical problems. More than 250,000 community members compete to solve thousands of innovation challenges posed by clients of these platforms, and win prizes for doing so. Despite the tournament structure of this approach to problem solving, robust communities of individuals share and learn from each other after the contests are over (Lakhani, 2008; Lakhani, Garvin, and Lonstein, 2010). Yet, it is not clear that all

types of innovation problems benefit from this community approach. In an analysis of more than 9,000 TopCoder contests, Boudreau et al. (2011) found that innovation outcomes declined when more individuals competed. Yet, communities clearly offer venues in which diverse experts can contribute to solving tough problems in ways that might be more difficult to achieve within an organization. For example, Jeppesen and Lakhani (2010) examined InnoCentive's scientific problem solving contests and found that the technical and social marginality of participants predicted winning submissions. Further research by organizational scholars is needed to understand these new business models. Among the critical questions are:

- How do firms determine which innovation problems to solve internally vs. externally? Why and how do firms use innovation platforms and communities to solve internal innovation problems?
- What are the organizational implications of firms using community innovation platforms? How do firms that do so motivate their own employees?
- How are solutions from external communities absorbed and implemented by organizations? How does this affect intellectual property rights practices?
- What organizational skills are needed to create an external community willing to contribute to a firm's innovation goals? What predicts who will contribute?

Community based business models are present not just in startups, but in mature industries and organizations. For example, IBM, which is consistently among the top five firms to obtain patents in the United States and worldwide, is also the most aggressive supporter of open source software communities. IBM's involvement with the open source community involves three distinct approaches, (1) replacing IBM software with open source alternatives, (2) porting open source products to run on IBM hardware and, and (3) releasing IBM software projects as open source products and building communities to support them (e.g., West and O'Mahony, 2008). When the first approach is pursued,

existing development teams learn to participate with the open source community (e.g., Baldwin et al., 2003) to which IBM also provides resources, mainly via employment opportunities. The second approach is simply a complementary asset strategy. By ensuring that key open source software projects are compatible with IBM hardware and software, the firm can sell complementary services. Finally, releasing a software project to a pre-existing open source community (e.g., the Apache Software Foundation) or launching an independent community (e.g., O'Mahony, et al., 2005) can be viewed as an attempt to create public standards for technologies IBM wants to promote. By using open source licenses and communities, IBM can assure other firms interested in working with that technology that it will remain open in perpetuity without risk of proprietary control.

Preliminary research on twelve firm founded open source communities suggests that, unlike free forming organic communities, communities sponsored by firms are more likely to offer transparency than accessibility, and this can affect community growth (West and O'Mahony, 2008). When launching open source communities firms are often more willing to share source code with a community to obtain benefits from the marketing and diffusion of that code than they are to open their code development processes to outsiders (West and O'Mahony, 2008). When there are fewer opportunities for participation and engagement, members of a software community are less likely to contribute to the code's future growth. This suggests that the boundaries between community and commodity production processes must be carefully managed. But we have few frameworks for evaluating these critical organizing decisions. Further research should address the following questions.

- How do firms create internal organizing processes to accommodate working with communities? Do these differ from traditional external partnerships?

- How do employees negotiate boundary roles with communities? When does the interest of the community overtake the interests of the firm and vice versa?

- How do community members who are also employees of competing firms interact in the best interests of the community and their firms?

- How do community dynamics, practices and processes change as firms employ more community members?

- How do firms manage community based production? Can communities actually be managed?

Conclusion. More studies of single communities will not generate a deeper theoretical understanding of the challenges shared by community forms. Furthering our empirical and theoretical understanding of the role communities play in organizational theory requires a framework that offers key parameters along which community forms can be compared. Gläser contends that a comparative understanding of communities should consider (1) the basis for relationships among the participants, (2) rules governing how membership is established, (3) ways in which to coordinate action, and (4) institutions that support the collective, and we would add a fifth, (5) communities' relations with markets (e.g., Chen and O'Mahony, 2009). A framework is needed not only to differentiate communities, but also to further our understanding of the evolutionary relationships among communities and organizations (Aldrich, 2009; Aldrich and Ruef, 2006).

1. What explains the emergence of communities within organizations and fields of endeavor? In particular, what are traditional organizations not doing or not capable of accomplishing that communities provide instead?

2. What types of activities and tasks are suited to community-based organizing, as opposed to hierarchical or market-based forms of

coordinating action? Are there significant performance differences in pursuing these activities with a community form?

3. Under what circumstances does community action replace or complement traditional organizational activities?

4. How do motivations for individuals to participate in communities differ from the motivations found in traditional organizations?

5. Absent traditional hierarchical positions, what means of coordinating work in communities are effective? What kinds of creative and/or innovative outputs are communities capable of producing?

6. How do communities create value for organizations? Under what conditions do communities become organizations or entrepreneurial ventures?

The concept of community is pervasive in at least seven subfields in organizational theory. Yet, there is little integration among these subfields that might further a coherent and integrated theoretical appreciation of community forms. Although our conception of community forms strives to be relevant across multiple levels of analysis, we recognize that a common typology might be more than is reasonable to expect. Rather, we encourage scholars to pursue a process approach that recognizes the fruitful intersections where communities affect core organizing processes. That community activity may not be formally recognized in many theoretical models does not mean that it does not affect organizational processes and outcomes in observable ways. By attending closely to how communities and organizations interact, scholars can build and test theories that more fully account for the variety of organizing models possible, and develop more robust explanations of organizing processes and outcomes.

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Table 1: The Community Construct in Organization Theory

Academic Subfield	Research Focus	Level of Analysis	Basis of Membership	Means of Coordination
Academic Communities (Merton, 1942; Crane, 1969; Knorr Cetina, 1999; Woolgar, 1976)	How norms affect how individuals share knowledge to achieve individual outcomes	Individuals in networks	Shared profession in pursuit of ***individual goals***	Professional institutions, norms and values
Occupational Communities (Van Maanen & Barley, 1984, Orr, 1996; Bechky, 2003)	How individuals who identify with a distinct occupation affect knowledge flows *at work*	Individuals within firms	Common occupation/ identity in pursuit of ***firm goals***	Professional institutions, work, artifacts
Communities of Practice (Brown & Duguid, 1991, 2000, 2001; Wenger, 1999 2000; Lave & Wenger, 1991)	How newcomers acquire non-canonical knowledge to learn new practice skills/ solve work problems	Individuals within firms	Shared practices in pursuit of ***firm goals***	Firm infrastructure, work artifacts
Technical Communities (Tushman & Rosenkopf, 1992, 1998; Rosenkopf & Tushman, 1994; Van de Ven & Garud, 1994; Rosenkopf et al., 2001; Van de Ven & Hargrave, 2003)	How different organizations cooperate to achieve common goals within an industry	Inter-organizational – across firms	Common ***firm goals***	Professional institutions, work artifacts
Online Communities (Rheingold, 2000; Smith and Kollock, 1999; Butler, 2001; Cummings, Sproull, & Kiesler, 2002; Butler, 2004; Fayard et al., 2004)	How individuals share information and provide social support outside of the workplace	Individuals in networks	Shared interests in pursuit of ***individual goals***	Shared practices, reputation, leadership
Collaborative Communities (Adler, 2001; Adler & Hecksher, 2006)	How community forms contrast with traditional, market and hierarchical forms	Within firms or networks	***Collective and individual goals***	Trust, shared practices, organic division of labor
Open Source Communities (Von Hippel & Von Krogh, 2003; Lakhani & Wolf, 2005; Lakhani & Von Hippel, 2003; O'Mahony & Ferraro, 2007; O'Mahony & Beckhy, 2008; Dahlander & O'Mahony, forthcoming)	How individuals organize to share knowledge, solve problems to achieve collective outcomes	Individuals in networks	***Collective and individual goals***	Artifacts, shared practices, reputation, leadership,