Discontinuities and Post-Bureaucratic Organizing: A Framework and Research Propositions

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Abstract

Some organization theorists argue that prevailing theories of organizing are based primarily on detailed observations of bureaucratic work, but that the nature of work today is sufficiently different to bring the applicability of these theories into question. They note in particular the growth in white collar and service workers, the rise of "contingent work" and the increased application of computer technologies. While various kinds of non-bureaucratic work such as project-based work and non-traditional employees such as contractors is not new, the pace and intensity of work enabled by communications technologies suggest that a post-bureaucratic theory of work may be appropriate. Indeed, "virtual" has become shorthand for novel work arrangements involving telecommuters or virtual organizations. We propose that an increasingly important characteristic of non-bureaucratic work settings is the fact that the workers in these environments face discontinuities, that is, a lack of coherence in aspects of their work, such as the work setting, task, relations with other workers or managers. In this paper, we argue that studying how discontinuities have been managed in a variety of settings may offer insights into the nature of post-bureaucratic work.

The first contribution of this paper is a framework that illuminates commonalties in diverse non-bureaucratic work settings and thus suggests how the existing research in these settings might be integrated. Based on this framework, we then consider how various existing theories might be integrated into a theory of post-bureaucratic organizing. We conclude by proposing a set of questions for future research based on this perspective.

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Organizational theories describe particular kinds of organizations. As Barley and Kunda [2001] put it, "All theories of organizing are at least implicitly linked to some image of the concrete activities that they purport to describe and explain" (p. 76). Barley and Kunda go on to argue that prevailing theories of organizing are based primarily on detailed observations of bureaucratic work, but that the nature of work today is sufficiently different to bring the applicability of these theories into question. They note in particular the growth in white collar and service workers, the rise of "contingent work" and the increased application of computer technologies. As managers and companies react to the attacks of Sept. 11, 2001, these changes seem likely to become even more prevalent.

Barley and Kunda's primary conclusion is that detailed studies of work should be reintegrated into organizational science in order to provide a solid empirical basis for post-bureaucratic theories of organizing. We do not dispute their conclusion, but at the same time, we note that non-bureaucratic work has always been with us and as a result, there is a fair amount of empirical work on various kinds of non-bureaucratic work. Examples include project-based work and the work of non-traditional employees such as contractors, and more recently, telecommuters and workers in virtual organizations (indeed, the term virtual has become a shorthand for such novel work arrangements).

In this paper, we argue that studies of these kinds of work are examples of the empirical work suggested by Barley and Kunda and can therefore provide insights into potential elements of a post-bureaucratic theory of organizing. Unfortunately, it is not yet clear how (or indeed, if) these diverse studies might be integrated into a coherent body, or even which phenomena to

include in (or omit from) the process of theorizing. The problem addressed by this paper is to make sense of the diverse range of research on non-bureaucratic work, to identify elements of a post-bureaucratic theory of organizing, and to suggest possible directions for future work.

The first contribution of this paper will be a framework that illuminates commonalties in diverse non-bureaucratic work settings and thus suggests how the existing research in these settings might be integrated. Based on this framework, we then consider how various existing theories might be integrated into a theory of post-bureaucratic organizing. We conclude by proposing a set of questions for future research based on this perspective.

FRAMEWORK DEVELOPMENT

In this section, we present a framework for integrating prior research on non-bureaucratic work. Clearly there are a great many dimensions along which work can be compared, but in this paper, we will only consider a few, such as the task itself, the location in which the work is done and relationships and communications among co-workers and between employers and employees. Our framework is based on the notion of "discontinuity" in the work, meaning a lack of logical agreement and dependence, or a break or gap in the succession or flow.

Discontinuities characterize many non-bureaucratic work situations

Barley and Kunda [2001] argue that organization theory has developed over the years to describe the work of a worker in a bureaucratic organization. In our view, a key characteristic of these environments is their continuity, which is defined as "an uninterrupted succession or flow; a coherent whole". In such a world, the worker arrives at a fixed workplace at 7 and works until 3 (or 9-5), has a specific job title and stable responsibilities, has a stable set of interactions with

other employees and managers, and remains with the same company for an extended period of time, with a career path with that organization that will take him or her to retirement.

As Barley and Kunda note, the reality for many workers in the 21st century is quite different. Today, an individual may work from home rather than in a factory or an office, or move from a work location in one geographic area to one in another. A worker may interact with a constantly changing set of co-workers, including some whom he or she rarely if ever meets face-to-face. Job responsibilities may change frequently, not just year-to-year but even week-to-week or day-to-day. Paychecks may come from different sources, and the individual may report to different managers (even different employers) for different projects. In short, where traditional work has continuities, these forms of organizing have discontinuities.

Discontinuities come in two forms. First, a discontinuity may be temporal, meaning a break in some kind of logical succession. For example, when workers move from one company to another, there is a discontinuity in employer. Second, a discontinuity may be cross-sectional, meaning a lack of coherence in aspects of an individual's work. For example, when workers report to different bosses for different parts of their work, there is a discontinuity in supervision, creating potential difficulties for both employees and supervisors.

We were led to focus on discontinuities in work for several reasons. First, while many work situations have long involved discontinuities, recent developments in the nature of work (such as those invoked by Barley and Kunda) involve an increase in both the pace and intensity of discontinuities. For example, contingent work is rising and these workers are confronted by numerous discontinuities in their work lives as they move from job to job, with no expectation of a continuing relationship with a specific employer. Second, the presence of discontinuities seems

to offer an explanation for why many new kinds of work seem problematic, making discontinuity a basic phenomenon to be understood. Finally, we were interested in discontinuities because of the claims made for the ability of information and communications technology to bridge many of these gaps. For example, some authors have suggested that electronic meeting technologies would enable groups to engage successfully even when geographically separated [for example, see Davidow, 1992].

To summarize, we suggest that an increasingly important characteristic of non-bureaucratic work settings is the fact that the workers in these environments face discontinuities, that is, a lack of coherence in aspects of their work, such as the work setting, task, relations with other workers or managers. An implication of this framework then, is that studying how discontinuities have been managed in a variety of settings may offer insights into the nature of post-bureaucratic work.

A preliminary typology of discontinuities

In this section, we will discuss possible discontinuities in work and work context, taking an individual worker as the focus. The goal of this discussion is to the lay the groundwork for a consideration of the effects of these discontinuities.

First, the work itself may be discontinuous, meaning that the worker faces a constantly varying set of tasks (a temporal discontinuity) or an incoherent set of tasks to be performed at once (a cross-sectional discontinuity).

Second, there may be discontinuities in the location of work activities. Rather than being done in a set location, work may now move from location to location, creating discontinuities.

For example, the practice of hotelling (assigning workers to a different workspace each time they come into the office in order to reduce real estate expenses) means that workers face a somewhat different work environment on each visit. Of course, fieldworkers have long faced the challenges of working in a constantly changing physical location. Cross-sectional discontinuities are created by new work arrangements such telecommuting (individuals working at home) or distributed teams (individuals working in different geographic locations at possibly non-overlapping times) such as global product development or software development teams, pulled together based on skill and not location [Townsend et al. 1998; Meadows, 1996]. Discontinuities in location may have further implications for differences in work context [Avgerou, 2001].

Third, a worker may face discontinuities in relations with management. A "virtual worker" might be a contingent or contract employee who is self-employed and has no dominant organizational affiliation but rather has temporary relationships with multiple organizations [Mowshowitz, 1997]. Such an employee may have a different boss from day to day or week to week, or even have multiple supervisors on the same day for different tasks. Even if workers are employed continuously by a single company, they might work on projects that take them from boss to boss.

Finally, there may be discontinuities in employee-employer or inter-worker relationships. Workers may interact with a constantly changing set of co-workers (a temporal discontinuity) as they move from job to job. Alternately, workers may face cross-sectional discontinuities as they collaborate with members of a variety of organizations, e.g., to develop a product, provide a service, or foster new legislation. While the individuals cooperate to achieve a common goal, they retain their membership in different organizations [Townsend et al. 1998]. These inter-organizational partnerships may be temporary, as in the case of a product-development team, or

may be more long-standing, such as a procurement team in a supply chain. An individual may have to interact with someone with a different professional, organizational or even national culture, if the team members are located in different countries [Boudreau et al., 1998; Carmel 1999].

Degrees of discontinuity

Different work settings may be characterized by different degrees of discontinuity. Scott and Timmerman [1999] studied teleworkers, and proposed that the "percentage of one's workweek spent away from the main office" (p. 245) can be used to segment workers into low, medium, and high categories of discontinuities. They note, however, that other researchers have used an arbitrary cutoff of time spent away from the office (e.g., 20 percent) to distinguish between virtual and non-virtual workers. In a study of virtual organizations, Burn and Barnett [1999] suggested that degrees of virtuality reflect the virtual organization's culture, the intensity of linkages, and the nature of bonds and the market (e.g., IT dependency and resource infrastructure, product, customer) (p. 216). They identified six virtual models that vary along two dimensions: interdependence/strength of organizational links and the autonomy and substitutability of the virtual links. Kraut and his colleagues [1999] offered a simpler demarcation, saying, "[O]rganizations are virtual to the extent that they outsource key components of their production processes" (p. 722), and the degree of virtuality is determined "in terms of the number and importance of cross-boundary transactions" (p. 724).

The options presented by the levels and degrees of virtuality permit organizations the flexibility to create adaptive rather than hard-wired organizational structures. These adaptive organizational designs feature highly dynamic processes, contractual relationships, edgeless and

permeable boundaries, and reconfigurable structures [DeSanctis and Monge, 1999]. Work can be dynamically allocated across people or subgroups depending on environmental demands resulting in increased switching of tasks, roles, and work assignments.

In summary, we suggest that post-bureaucratic work is characterized by discontinuities, meaning a lack of coherence or gaps in a pattern, either temporal or cross-sectional. These discontinuities may arise in the work itself, in the location and general context of the work, and in supervisory and inter-worker relationships. It is worth noting that these dimensions are independent. For example, a worker in an architectural office could be part of a stable workgroup but still work on a variety of different projects, thus facing a task discontinuity but not the other three. While the four dimensions we have identified here clearly do not exhaust the range of possible discontinuities, we believe that the range provides a reasonable starting point for further theorizing. Therefore, in the next section we examine the implication of these discontinuities for work and for organizing.

IMPLICATIONS OF DISCONTINUITIES FOR WORK AND ORGANIZING

In this section we explore some of the implications of discontinuities for organizing in order to identify bodies of literature on which to build a more general theory of post-bureaucratic organizing.

Discontinuities make sense making more difficult

The first body of literature we identify is sense-making. As discussed above, workers in many non-bureaucratic work environments face discontinuities in task. On the one hand, the ability of individual workers to switch quickly from task to task allows organizations to be more

flexible. Kevin Kelly [1999], in his book *New Rules for the New Economy*, calls for organizations to be more dynamic and responsive to emerging business opportunities, yet an environment of ever-present change makes good management even more challenging. In such a situation, success may be determined not by having the right organizational structure but by the capacity to evolve. Speaking about the IT activities required to support such evolution, Sambamurthy and Zmud [2000] suggest, "…these capabilities will be assembled, delivered, and then disassembled through a variety of intra and inter-organizational networks (rather than through the IT function acting quasi-independently in a command and control manner)." (pp. 112-113).

However, this organizational flexibility comes at a cost to the workers. In order to be effective, workers must develop mental models of their work situation. These mental models and component schemas reflect the worker's particular context Expectations are shaped through interactions and observations in that context, e.g., particular organization, functional area, etc. Understanding and expectations of events and behaviors of others is developed, and meaning is attached to these events and behaviors, e.g., performance expectations, and socialization practices. In this way, individuals and groups of individuals can agree on meaning and develop expectations of behavior that simplify the work environment [Rousseau, 1995].

People then frame action choices based on their understanding of the situation, and expectations of outcomes of their actions. From a cognitive perspective, these expectations are part of the individual's mental model of the situation, an internal representation of reality which guides thinking and acting [Eden & Spender, 1998]. At a deeper level is the use of schemas by individuals in organizing knowledge and guiding action. Schemas enable an individual to meaningfully organize prior experiences and information from a series of events that have

happened across a period of time. [Matlin, 1998]. Schemas make it possible for people to deal with ambiguity in well-practiced ways by associating them with prior experience, and therefore enabling them to predict what should happen next.

When changes are made to the context of the work environment, the individual must make sense of these changes to adjust behavior. Use of information and communication technology can rapidly change the parameters of that context leading to confusion and misunderstanding as differences are introduced. "The difficulty involved in clarifying, exploring, testing, and negotiating expectations will depend on the *a priori* differences between the two people involved" [Gaborro 1990]. People in virtual work environments must often manage differences, some more significant than others, continuously.

These changes apply as well to interactions with other workers and with managers. Workers also develop expectations of the behavior of others. In Gabarro's model of the development of relationships, individuals move toward stabilization in their relationships, defining an interpersonal contract of behavior that is difficult to destabilize [Gaborro 1990]. A more broadly-based notion is the psychological contract, "beliefs held by individuals, shaped by organizations, regarding terms of an exchange agreement between individuals and their organization" [Rousseau 1995]. These beliefs, e.g., understanding of performance goals and incentives, expectations of resource commitments, etc., guide the actions taken by employees.

Again, discontinuities in work imply that a worker will be interacting with a changing set of co-workers, managers, customers, or with members of different organizations, with possibly different professional, organizational or national cultures. Again, there is a benefit and potential cost. On the one hand, because of the constant exposure to new ways of thinking, these

relationships might enhance an individual's (and thus the organization's) innovativeness. On the other hand, since the individuals working together may not share common vocabularies, assumptions, norms, mental models, and so forth, they may find it difficult to understand each other, or worse, believe that they understand each other while oblivious to the presence of misunderstandings.

For example, in implementing a virtual supply chain, while there were many advantages with respect to efficiency, many of barriers found to be most prominent in this environment have to do with the relationships between individuals and difficulty of "teaming," e.g., loss of richness of interaction, loss of social contact. The authors conclude that the members of the supply chain saw "an application of technology," and not a capability for enabling a team. Likewise, lack of socialization has been cited as a barrier to many remote work programs. To successfully implement organizational change, then, clearly involves changes in behaviors and actions of individual members of the team.

We now turn our attention to what the literature says about how discontinuities might be managed.

MANAGING DISCONTINUITIES

The challenge for organizations operating in virtual environments is to successfully manage the discontinuities or gaps in connections between individuals or collective bodies of individuals. One solution may be to enhance people's ability to manage change and to learn to operate in a state of continuous change. Practitioners and academics have long recognized the importance of effectively managing change, and we believe that this is especially relevant in

virtual environments. In the remainder of this section, we describe structures that are likely to experience change with which individuals and organizations must contend.

Getting good at change management

The emphasis on flexibility and evolution implies that change management becomes a continuing process rather than a one-time heroic effort. Research on organizational change has primarily examined episodic or radical change, [Pettigrew, Woodman, & Cameron, 2001; Brown & Eisenhardt 1997] which can be described as "infrequent, discontinuous, and intentional." However, to manage in the face of on-going discontinuities as we have conceptualized them requires the ability to handle an on-going stream of changes. Little is known about the changes in basic work processes that individuals must navigate to effect and manage changes introduced into their work environment [Brown & Eisenhardt 1997]. Individuals work with discontinuous set of individuals, such as in the agile supply chain, where teams were expected to be temporary, constantly reconfiguring in response to the environment. The discontinuities in geographical location and organizational identity mean that individuals now interact and form relationships with team members with different perspectives, and even different languages, about their work environment. The methods of interacting with team members will change to accommodate these differences, or the differences may become a barrier to success in this environment.

Exploring continuities

While we have emphasized discontinuities as the novel feature of non-bureaucratic work, a wide selection of factors in a given work situation may stay the same. This set of constant elements, or *continuities*, can vary across work arrangements and organizations. Continuities are factors that influence behaviors that workers are aware of and consciously act on, or they may be

implicit and unrecognized. Continuities play a significant role in bridging the potential differences introduced with discontinuities. Surfacing continuities helps bridge new situations. Finding or creating continuities to deal with discontinuities helps to make coherent what we already know. Flight operations staff at United and American airlines found themselves dealing with unexpected radical behavior on September 11, 2001. Prior expectations – mental models - about dealing with hijacked airplanes were no longer valid. Operations staff tried to make sense of the situation by finding aspects of the situation that were still applicable. In other words, they tried to find or create continuities to help them make sense of the situation.

In a recent review of the research on virtual work arrangements using a discontinuities framework, Watson-Manheim and her colleagues [2002] found that many studies were simultaneously addressing existing or emerging continuities, i.e., factors or strategies for overcoming discontinuities. The focus of "virtual" is on the changes in the work environment; however, their analysis suggests the need to be equally aware of factors which have not changed and which may become more critical with the introduction of discontinuities [Watson-Manheim, Crowston, & Chudoba 2002]. Organizations typically strive for continuities because of their inherent efficiency and predictability [Leanna & Barry 2000], which may help explain why Watson-Manheim et al. found that discontinuities in organizational processes were accompanied by continuities that were explicitly in place or that emerged to bridge the discontinuities.

In the development of dyadic relationships, the process of developing mutual expectations, or overcoming differences, "will appear to be routine, invisible, or tacit, except where differences in initial expectations are clear" [Gaborro 1990]. The process of moving through different stages of the relationship usually occurs as routine interactions take place, such as "ad hoc encounters, meetings, progress reviews, and discussions of task-based problems."

Between the individual and the organization, the continuity is a collective understanding of some aspects of the work environment. In studying open-source software development projects where members joined on a voluntary basis and communicated through the Internet, Markus, Brook, and Agres [1997] found well-structured governance mechanisms. Despite the potential for "free-loading, unstable membership, and low-quality contributions" in an informal virtual organization, the projects worked "remarkably well." They attribute effective coordination and management of many open source projects to the members' shared context of a "hacker culture." In addition, there is also a shared motivator - "the ability to commercialize the product," and make money from it - which gave the groups a common goal.

Continuities, such as shared motivation, understanding of the task, mutual expectations, and others, provide the stability necessary to deal with the introduction of discontinuities or differences. Indeed, stability seems to be a prerequisite for flexible and adaptable behavior [Leanna & Barry 2000]. This interaction of continuities and discontinuities parallels the notion of semi-structures in organizations as described by Brown and Eisenhardt [1997]. They describe semi-structures as "some (organizational) features are prescribed, e.g., responsibilities, project priorities, time intervals between projects) and determined, but other aspects are not." There is then partial order, or stability, which they find enables continuous change in organizations.

From a cognitive perspective, once expectations, or mental models of a situation, are developed, they are resistant to change. When faced with uncertainty, people will try to associate the current situation with prior experience or information they have from other events. In this way, cognitive structures enable continuity [Rousseau 1995].

Recently, authors have recognized the existence of continuous change; changes that are "ongoing, evolving, and cumulative" [Pettigrew, Woodman, & Cameron 2001]. In the virtual work environment, individuals may not only be managing continuous change, but also there is a continuous potential for change adding to the complexity of the work process. Virtual team membership may change fluidly due to environmental factors. Also, only a portion of an individual's work may involve discontinuities. For example, an employee working on a inter-organizational team in a supply chain will probably also be working with intra-organizational teams. And she may only be involved in the supply chain team on an as-needed basis.

Temporal Factors

Change can then be viewed as a dynamic process that is stabilized and enabled by situational continuities. This view requires that we examine temporal factors in addition to discontinuities and continuities. Brown and Eisenhardt [1997] find that time is critical to continuous change. People who successfully managed continuous change processes paid attention to "links in time: explicit organizational practices that address past, present, and future time horizons and the transitions between them."

Pettigrew et al. [2001] emphasize the importance of a time-orientation in their definition of the change process as: "sequences of individual and collective events, actions and activities unfolding over time in context." This definition of the change process is also action-oriented. As behavior choices are made and outcomes realized in the context of the differences, expectations are changed and schemas adapted to reflect new information.

In an investigation of organizational routines, Feldman [2000] found rich action-oriented mechanisms for enabling continuous change. Routines were not stable as expected; they were

continually changing as workers faced new situations and adjusted their actions, and consequently the routine of action. She conceptualized routines as a cycle of plans, actions, outcomes, and ideals (reflection). Plans and actions produce results that influence what it makes sense to do next in the context of the individual's ideals and values.

Cognitively, the adaptation of mental models and schemas to accommodate change occurs as new situations are encountered which cannot be interpreted by existing schemas. As new situations are encountered and behavior choices are made, schemas are adapted to reflect the new information. This continuous process requires attention to actions and outcomes in the present, the results of previous behavior choices, and the expectations for future results. Often this is a tacit process happening over time without explicit awareness by the individual or group of individuals.

RESEARCH PROPOSITIONS

We have linked the management of discontinuities to cognitive patterns and the process of sense-making by individuals. In addition, approaching this process from a change management perspective gives us a clearer view of components of this process and initiates our understanding of a new theory of organizing. To further develop this theory, we believe it is important to examine these components in more depth.

Categories of Discontinuities

First, more research is needed to elucidate the categories of discontinuities that are important in post-bureaucratic work. We have suggested four basic categories, but clearly the list could be expanded. For each, work is needed to assess how to measure the discontinuity and the

relative importance of the discontinuities clarified. For example, location is one possible kind of discontinuity [Burn and Barnett, 1999], but at what point does separation become a problem for workers? Is it a problem to be in a different office in the same building? In different buildings in the same city? In different cities in the same country? Orlikowski [forthcoming] describes other discontinuities (she calls them boundaries) that she found in global software development teams in one company. Included were historical (different versions of the same software product under development), technical (software running on different computer platforms accommodating multiple standards), and political (different interests across functions, products, and local vs. global priorities). Communication practices may be another source of discontinuity among workers. DeSanctis and Poole [1999] propose that differences in information technologies such as their structural features and spirit will encourage different social interactions. Culture, whether national [Burn and Barnett, 1999], occupational [Scott and Timmerman, 1999], or organizational [Wiesenfeld, et al. 1999] is an additional form of discontinuity likely to be very relevant to post-bureaucratic work in the 21st century.

P1. Discontinuities can be described in terms of their dimensions. To the extent dimensions vary, discontinuities will play different roles in understanding work and worker interactions in a given context.

Effects of Discontinuties

Second, the effects of discontinuities on workers need to be better understood. In the section above, we sketched the likely effects of discontinuities on sense making, but these effects need to be verified. Discontinuities may also be related to the amount of uncertainty a worker experiences. For example, does a discontinuity in work location introduce increased feelings of

uncertainty for both the worker at home and the worker at a central office as each wonders, "Will my co-worker be available when I need to get in touch with her?" Prior research indicates that swift trust [Jarvenpaa and Leidner, 1999; Myerson et al.1996] may ameliorate feelings of uncertainty as well as help workers overcome other discontinuities, but more research on this is needed. Discontinuities may also be linked to increased worker perceptions of risk, especially when a discontinuity also signals a point of change.

P2. Worker outcome attributes such as feelings will vary depending on which discontinuities are present.

Bridging Discontinuities

We know from research and practice that work gets done even in the presence of multiple discontinuities. How is it that workers manage to connect with one another in the face of discontinuities? Orlikowski [forthcoming] found that the practices and continuities of shared identity, interacting FTF, aligning effort, learning by doing, and supporting participation permitted global software development teams to develop innovative products on time, within budget. On the other hand, in their research on demographic difference in groups, Lau and Munighan [1998] suggest "… faultlines [e.g., demographic differences] tend to reinforce themselves through time if they become active in a group's early development. Otherwise, faultlines remain dormant, and their strength will decrease as increasing social dimensions are realized; thus, stable subgroups increasingly become less likely." Similarly, it is unclear whether the interaction of a given set of discontinuities and continuities will lead to differences in group dynamics and performance. Some discontinuities may not adversely impact group dynamics or performance, and thus will require little effort to manage.

Earlier, we argued that discontinuities might signal a point where change is occurring. The change that occurs to manage the discontinuity may be a change in management style or practice. Are there meta-routines or cognitive patterns for handling circumstances of continuous change that lead to the fluid emergence of continuities? These meta-routines may indicate an attempt to bring characteristics of continuity to the discontinuity. In other words, they represent an institutionalization of discontinuity, thus making it more of a continuity. Replication of discontinuity represents (or becomes) continuity. If we assume that continuities are what organizations strive for (due to the inherent efficiencies in continuities), then organizations would seek to "routine-ize" a discontinuity as much as they can.

P3. Over time, discontinuities will assume the properties of continuities as compensating mechanisms evolve that routine-ize them.

Information technologies, especially communications technologies, are commonly recognized as one of the enablers of virtual work because they permit workers to bridge discontinuities such as time and space. The dominant perspective in the literature assumes that technology is a given, and so researchers study the impacts of technology use under circumstances of actual or potential discontinuities. Relatively little attention has been paid to research on the design or use of specific technologies that encourage continuities, such as knowledge repositories for conversations and documents.

P4. Information technologies that support continuities foster benefits equal to or greater than those technologies that support discontinuities.

We have suggested that in the face of discontinuities, the set of continuities becomes an important resource. Some set of continuities may need to be explicitly present for success. For

example, Maznevski and Chudoba [2000] found that virtual teams required a sequence of regular FTF communication incidents interspersed with less intensive, shorter incidents using various other media for effective performance. Crowston [2000] reported a similar dependence on continuities in a study of the virtual factory – a shared national culture and shared professional culture held the group together so that it could function successfully. Kumar and his colleagues [1998] found that standardized supply chain management procedures and a social network substituted for what would have been in place if all production had been done in one company. In all of these studies, the continuities weren't sufficient in and of themselves, but they were important contributing factors to success.

P5. A set of continuities is necessary to bridge discontinuities in virtual work arrangements.

Changes over Time

The role of time in understanding the role of discontinuities is another area that warrants study. One aspect of time is synchronicity. Burn and Barnett [1999] suggest the importance of exploring the extent to which members of a virtual entity interact synchronously versus asynchronously. A second aspect of time is its passage. What changes in continuities, discontinuities, and work patterns evolve over time? How do individuals in post-bureaucratic work arrangements respond to issues of change and flexibility, the development of trust [Whitener, et al., 1998], and task-oriented relationships [Gaborro, 1990]?

P6. The effects of time in post-bureaucratic work will be different, depending on whether it is studied synchronously or asynchronously, or at a single point in time versus longitudinally.

Applicability to Multiple Levels of Analysis

Finally, while we have discussed the phenomenon of discontinuities at an individual level, we believe that similar arguments can be made at multiple levels of analysis. Virtual is also used to describe groups that form new kinds of inter-organizational relationships. For example, employees of multiple organizations may collaborate to develop a product, provide a service, or foster new legislation. While the individuals cooperate to achieve a common goal, they retain their membership in different organizations [Townsend et al. 1998]. These inter-organizational partnerships may be temporary, as in the case of a product-development team, or may be more long-standing, such as a procurement team in a supply chain.

Investment banks, which are known for rapid change, provide a good example of the permeable boundaries necessary to grow an organization web. In order to respond to new opportunities in the market, these institutions must frequently modify their teams, adding people or affiliations with outside experts. Simultaneously, however, the banks must be able to modify their internal relationships. Porous boundaries – to the outside, and within – give them needed flexibility. Further, most individuals belong to multiple internal groups, making it easier to move people around. [Davis and Meyer, 1998]

Virtual societies are online gatherings of people with an interest, some might say passion, for a given topic or product [Hagel and Armstrong, 1997]. Included in this broad category are MUDs, news groups, and government-supported infrastructure for communication and information sharing. On-line communities of practice such as those that have evolved around software development [Ahuja and Carley, 2000; Markus and Agres, 2000] exemplify virtual societies. For example, members of the Linux community of practice use electronic bulletin

boards and discussion groups to share programming problems and solutions, although group members rarely if ever meet FTF.

P7. Discontinuities and continuities will have similar characteristics, relationships, and interactions, whether the unit of analysis is the individual, group, organization, or society.

CONCLUSION

The reality of workers in the 21st century is one where an individual may work from home, or move from a work location in one geographic area to one in another geographic area. The worker interacts with a changing set of people, whom he or she may not see FTF. We call these breaks or gaps discontinuities. In this paper, we discussed the role of discontinuities as a defining factor in post-bureaucratic work. We presented a framework that illuminates commonalties in diverse non-bureaucratic work settings and thus suggests how the existing research in these settings might be integrated into a theory of post-bureaucratic organizing. We concluded with a set of questions for future research based on this perspective.

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