

Tangible Purposes and Common Beacons: The Interrelated Roles of Identity and Technology in Collaborative Endeavors

Nils Olaya Fonstad

Center for Information Systems Research
MIT Sloan School of Management
3 Cambridge Center, Rm. NE 20-336
Cambridge, MA 02142-1607
nilsfonstad@mit.edu

Abstract

Drawing on structuration theory, research on improvising, technologies-in-practice, organizational identity, and examples of collaborative endeavors from an eight-month field study I conducted at an internet-based startup, I propose that an essential structure to collaboration is a complementary set of understandings between participants regarding the purpose of their collective endeavor - what I term *project identity*. I use an improvising framework to describe how participants attempted to innovate collectively (at first, unsuccessfully, then, successfully). Improvising consists of enacting structures that guide three sets of activities: assessing continuously, creating resourcefully, and adapting extemporaneously. As they worked together, participants both improvised a project identity and drew on a project identity as a set of rules and resources to guide their improvising. Technological artifacts were integral to enacting project identities. DotOrg participants created and adapted artifacts, and used them as tangible structural referents to bridge boundaries and structure and coordinate their activities.

Keywords: Practice-based perspectives; Improvising; Emergent artifacts; Project Identity

Suggested Track: The role of information technology in knowledge management and collaboration.

1. Introduction

What factors enable a group of individuals - particularly individuals who are from different occupations and who have never worked together before - to successfully accomplish a collaborative endeavor? Drawing on structuration theory (Giddens, 1984), research on improvising (e.g., Ciborra, 1996, 1999; Fonstad, 2003; Hatch, 1998, 1999; Kamoche and Cunha, 2001; McGinn and Keros, 2002; Miner et al., 2001, Orlikowski, 1996; Weick, 1993, 1998), technologies-in-practice (Orlikowski, 2000), cross-boundary collaboration (e.g., Bechky, 2003; Boland and Tenkasi, 1995; Carlile, 2002; Carlile and Reberntsch, 2003; Dougherty, 1992; Wenger, 1998), collective action (e.g., Donnellon, Gray, and Bougon, 1986; Hardy, et al., 2005; Weick and Roberts, 1993), organizational identity (e.g., Gioia et al., 2000; Glynn, 200; Golden-Biddle and Rao, 1997, Wenger, 1998), and examples of collaborative endeavors from an eight-month ethnographic field study I conducted at an internet-based startup, I propose that an essential structure (c.f., Giddens, 1984) to collaboration is a complementary set of understandings between participants regarding the purpose of their collective endeavor - what I term *project identity*.

In this paper, I use an improvising framework to describe how participants at DotOrg engaged in several collaborative endeavors (at first, unsuccessfully, then, successfully). I also use improvising to describe how participants enacted project identity. Improvising consists of enacting structures that guide three sets of activities: assessing continuously, creating resourcefully, and adapting extemporaneously (Fonstad, 2003). As they worked together participants both improvised a project identity and drew on a project identity as a set of rules and resources to guide their improvising.

Technological artifacts were integral to enacting project identities. DotOrg participants created, pieced together and adapted artifacts, using them as tangible structural referents to bridge boundaries and to structure and coordinate their activities without having to reach equal understandings regarding the purpose of their collective endeavor.

The paper is structured as follows. I first describe the methods I used to gather and analyze my field data. I then describe DotOrg, the research site where I conducted my field work, and two

examples of collaborative projects that I witnessed at DotOrg: developing a funding pitch and developing a web prototype.¹

Developing a funding pitch proved to be significantly more difficult than developing a web prototype because in the case of developing a funding pitch, participants struggled for nine weeks to reach consensus around what DotOrg should do (e.g., DotOrg's business model, DotOrg's target audience, etc.). However, once they reached sufficient consensus on the identity of the startup, they were able to develop a funding pitch in under three weeks. I introduce the framework of *improvising* to describe the general collaborative process of innovation that constituted both projects. I then introduce the concept of *project identity* to describe the set of understandings that participants have regarding the purpose of a collaborative endeavor. I highlight the importance (and often taken for granted process) of project identity as a structure in collective improvising. In developing a funding pitch, actors initially drew on different, conflicting project identities and were unable to collaborate until they engaged in consensus-building and developed a common project identity. In the case of developing a web prototype, actors quickly established a complementary set of understandings regarding the purpose of the project and project identity was enacted in a routine and non-contentious manner.

Finally, I discuss the potentially critical role of artifacts as tangible structural referents of project identity. For example, participants created and used artifacts to bridge boundaries and engage in collective reflection-in-action (Levina, 2002), improvising, and consensus-building. They also created and used them as representations and components of identity to structure their collective endeavors.

2. Methods

The concepts and findings that I present in this paper emerged from research I conducted exploring the roles of technology in improvising (Fonstad, 2003). Overall, the process by which I developed the concepts in this paper was exploratory, inductive, and iterative, moving between collecting data; analyzing, comparing, and reflecting on them; developing and adapting my theoretical concepts; and discussing my theoretical insights and empirical findings with others. The exploratory process followed the principles of grounded theory (Glazer and Strauss, 1967,

¹ DotOrg and all other names used in this paper are pseudonyms. In addition, although at this time DotOrg still exists as an active organization, I describe my findings regarding it in the past tense because I am reporting on things as they were.

Strauss and Corbin, 1990) and was structured throughout by two practice-based theoretical frameworks, structuration theory (Giddens, 1984) and an extension of structuration theory, technologies-in-practice (Orlikowski, 2000).

Practice-based theories argue that to understand a phenomenon (e.g., structure, knowledge, learning, innovation, creativity), one must examine the situated practices that constitute that phenomenon. Consequently, to understand the roles of technology in improvising, I had to collect data on the practices that groups of individuals engaged in as they improvised. In the case of DotOrg, I accomplished this by conducting an eight-month ethnographic field study using principles and strategies of participant observation (Jorgensen, 1989).

I focused my data collection on the work activities of participants, particularly as they strove to collaborate and accomplish joint projects, and the contexts in which they worked. As I collected data, I sought to triangulate my findings by collecting multiple sources for data. In general, I accomplished this by complementing my personal observations in the field (in the form of either field notes, audio-tape recordings, or both) with archival sources (paper and electronic documentation).

The process by which I analyzed my data was similar to the process by which I initially developed my theoretical frameworks: an iterative reading and analysis of data. I drew on the principles of grounded theory (Glazer and Strauss, 1967; Strauss and Corbin, 1990) but did not employ all their techniques nor use their techniques in the exact manner they are prescribed (Rennecker, 2001). I began by examining existing relevant literature on improvising in organizations for common themes, developing an emergent set of categories, and then re-reading the literature to see how it fit with the categories. Then building on this analysis, I drew on accounts of improvising from artistic disciplines, in particular, accounts of improvising in African American quilting, to develop my own framework on the roles of technology in improvising. Once I developed my theoretical framework, I re-analyzed my field data by examining what activities fit within the framework and what activities did not. I then examined those activities that fit within the framework to see if I could develop any finer categories or concepts. I did the same for those activities that did not fit within the framework. For example, the "problems" experienced by DotOrg participants during the first nine weeks of developing a funding pitch proved extremely valuable to highlight aspects of the innovation process (e.g., project identity) that were otherwise so normal and routine that I had taken them for granted and did not consider them significant.

I conducted several iterative readings of the data until I identified potential themes regarding

similarities and differences across the sets of data. I then re-read the data to examine the relevance and prevalence of the theme, try to better understand why it was or wasn't relevant or prevalent, and adjust my emerging theoretical concepts accordingly.

Overall, in addition to relevant literature, I drew on three cases on improvising - improvising by African American quiltmakers, improvising by a team of chemists (part of a second field study I conducted on improvising), and improvising by entrepreneurs at DotOrg - to develop my theoretical concepts related to the roles of technology in improvising.² This enabled me to corroborate concepts ("replication") and develop more elaborate concepts ("extension") (Eisenhardt, 1991).³ To check the accuracy of my interpretations, I triangulated my findings. Where I was unable to triangulate a finding, I noted the ambiguity or removed it altogether.⁴

3. Findings

3.1 DotOrg

In the Spring of 2000, at a Chinese restaurant in San Francisco, Margaret and her boyfriend sketched out on the back of a paper placemat the kernel of a business plan for a nonprofit internet startup called DotOrg. Soon afterwards, Margaret convinced her sister, Natasha, to help her launch DotOrg. Later, in May, they won a nonprofit business plan competition held by Greenhouse, an incubator set up to foster start-ups by providing them with financial, operational and communal support. DotOrg's mission was to work with nonprofit organizations that held special events, such as walkathons and bikeathons, and use the Internet to streamline those organizations' fundraising efforts and extend their community outreach. I followed the founders of DotOrg from May 2000, when they were announced as winners of the competition, until December 2000, when I participated in the first special event "powered by" DotOrg. During that time period I spent the first four months shadowing the founders almost every weekday, and another four months visiting them two to three times a week.

Several key players were involved in the development of DotOrg. Most important were the founders, Margaret and Natasha ("Founders"). Throughout my field study, they were the central figures in most activities concerning the nonprofit startup. From the incubator, there was a team

² Because of space constraints, I will only draw on findings from my field study of DotOrg.

³ Eisenhardt (1991:620) notes: "[Replication] helps researchers to perceive patterns more easily and to eliminate chance associations. Different cases often emphasize complementary aspects of a phenomenon. By piecing together the individual patterns, the researcher can draw a more complete theoretical picture"

⁴ For a more detailed discussion on my methodology, please refer to Fonstad (2003).

of employees who served as advisors to the founders ("Advisors") and a team from new product development that helped develop the Internet components of DotOrg ("Web Developers"). In addition, as part of the winning package, two MBA students ("Fellows") spent twelve weeks at DotOrg, under the guidance of consultants from their university and a management consulting firm ("Consultants"), which was also funding their summer work. The Advisors, Fellows and Consultants were quite involved with advising DotOrg, during its first three months at Greenhouse (i.e., summer of 2000).

The initial months of DotOrg were rife with numerous interrelated projects that had to be undertaken simultaneously and urgently. These included building the basic structure of DotOrg, addressing fundamental questions about DotOrg (e.g., who are we? what is our service/product? what is our strategy?); signing on customers; developing a funding pitch; assembling a board; and obtaining legal status. As the Founders struggled to manage all the projects, they received a lot of advice, both solicited and unsolicited.

3.2 Developing a Funding Pitch

Developing a funding pitch became the first significant project at DotOrg and it involved all the key players. To everyone's great frustration, however, the project proved to be a great deal more difficult than anticipated. The process by which the funding pitch was developed lasted twelve weeks and consisted of two general stages. During the first stage - the first nine weeks - the parties struggled to make sense of the specifics regarding DotOrg's mission (e.g., Who exactly was DotOrg's target customer? What services would DotOrg offer? How would DotOrg generate revenues?). The Consultants provided the Fellows with guidelines for and advice on structuring and managing the process of putting together a funding pitch, based on their vast experience and success with other clients. While researching potential customers and competitors, the Fellows became "scared by the revenue numbers" that they were calculating. Their research indicated the market was too small and competition from well endowed for-profits too great for DotOrg to succeed. Consequently, the Fellows began to have reservations about the viability of DotOrg's original business model and started to develop alternative business models for DotOrg. As concerns grew and the Fellows tried to formulate clear answers to questions, the Founders grew frustrated by the skepticism and apparent lack of support for their original mission. The Fellows, Consultants, and Advisors became so convinced that DotOrg was not financially viable that they developed 10 alternative business models for DotOrg and persuaded the Founders to consider them. From the point of view of the Founders, each

alternative was a significant change to their original mission. In the process, it became clearer that there was a lack of consensus regarding how exactly DotOrg should help nonprofits.

By the eighth week, the funding pitch was not yet developed and most participants had become so frustrated with the lack of progress that tensions boiled over. At a large meeting involving all participants, the Founders reluctantly narrowed the ten alternatives down to three (becoming a volunteer and donation management tool for large organizations; becoming the nonprofit arm of a for-profit company, or becoming the Consumer Reports of e-philanthropy). After a few stressful days of debating the three options with others, however, the Founders decided to pursue their original mission statement. The Founders argued that DotOrg was a *nonprofit* with a mission to help other nonprofits. The Fellows had identified a market that was so unattractive to for-profits that only nonprofits such as DotOrg should address. The Founders drew on common understandings that had formed during the first stage, including the same data that was used to question the viability of the original mission, to explain their decision. After they argued their reasons in terms that made more sense to others, there seemed to be a greater sense of clarity and shared understanding among all the participants regarding the value proposition of DotOrg. As one of the Fellows explained:

[W]e got it originally in our minds that competition was SO intense that there was no space for [DotOrg]. And I think if you have that mental data point in your mind, it's very hard to progress. And so it was almost like I forced myself to say "OK. Let's just relax that a little bit and try to figure out: If there were going to be a way through the forest, what would it be?" And then see if then we can cater the data to justify that statement. Because I almost think that you can look at data more than one way. [...] Because we keep on going back to data as if it is this god that's going to absolutely dictate what the story is. But I truly think you can make up 3-4 different stories based on the exact same data set [...] [Now that the Founders] have said "Look, we're making the decision based on gut a little bit, so figure out a story that's going to work." We need to do that without being academically dishonest.

By the end of Week 9, with greater clarity and shared understanding regarding how DotOrg intended to help nonprofits, the Fellows, Consultants, and Advisors were more motivated to work on the funding pitch. This understanding proved to be an essential structuring device for subsequently developing the funding pitch.

During the remaining three weeks that made up the second stage, the Fellows pieced together a funding pitch from the market and competitive research they had developed earlier. And, guided both by a clearer understanding of and stronger belief in what the Founders wanted and by the consulting firm's expertise and guidelines on developing presentations, the Fellows developed eight slides representing the core arguments of DotOrg's funding pitch. Developing a

common understanding of DotOrg also contributed to the success of the development of a web prototype, the next most significant collaborative project at DotOrg.

3.3 Developing a web prototype

In August, as the funding pitch project was wrapping up, the Founders decided to develop a web prototype of the service they imagined providing to nonprofits. The participants in the web prototype project were the Founders, the Advisors, and the Web Developers. The prototype was essentially a collection of web pages with some functionality, put together as a walkthrough of the service, from the point of view of different users. The overall process of creating and adapting the web prototype was structured in a manner similar to past projects that one of the Web Developers had worked on and according to a "look and feel" that was defined collaboratively between the Web Developers and the Founders. To construct the first web prototype, the Web Developers drew on, among other things, the funding pitch document created by the Fellows, stories of imagined user experiences developed by the Founders, images downloaded from the web and an image stock house, and computers to communicate among the team members, write the html code, and in general, piece together the prototype. When the initial prototype was complete, the Founders used it during a meeting with a potential customer. The meeting seemed promising but no firm agreement was reached and it was clear that the potential customer was not very familiar with the Internet and did not seem convinced that DotOrg's service was valuable. The Founders and the Web Developers returned to the Incubator and worked together to adapt the prototype to include images and information about the customer's special event, thus tailoring the prototype to the customer. The Founders arranged another meeting with the potential customer. From this meeting, the customer agreed to use their service and the prototype became the basis for developing the real service. All of this occurred over the period of a month.

3.4 Improvising at DotOrg

The processes of developing a funding pitch and developing a web prototype are both examples of improvising (Fonstad, 2003). In organizational studies, a growing number of researchers are using the framework of improvising to make sense of the process of change and innovation in dynamic environments (e.g., Bastien and Hostager, 1988; Brown and Eisenhardt 1997; Ciborra, 1996, 1999; Crossan et al., 1996; Crossan et al., 2005; Eisenberg, 1990, Garud and Karnøe, 2003; Hatch, 1998, 1999; Kamoche and Cunha, 2001; McGinn and Keros, 2002; Miner et al., 2001, Moorman and Miner, 1998; Orlikowski, 1996; Weick, 1993, 1998; Zack, 2000). Based on

these literatures, and literature on improvising in African American quilting, I propose the following definition of improvising:

Improvising is a structured process of innovation that involves responding to changing situation(s) with resources at hand by creating a production and adapting it continuously.

Stated differently, improvising consists of *enacting structures* that guide three sets of activities: *assessing continuously, creating resourcefully, and adapting extemporaneously*.⁵ In the process of improvising, individuals create one or more productions (Miner et al., 2001). Productions may be conceptual, such as a song or theater performance, or tangible, such as a website or a handout describing an organization's funding pitch.

From my field data, I found that improvisers draw on a *set of structural referents* to guide their improvising. A structural referent is a representation one develops about a structure. The representation may be conceptual or concrete, in the form of a story, artifact, recollection of instantiation(s) of the structure, or combination of the aforementioned. For example, throughout the process of developing a funding pitch, the Fellows and Consultants followed a detailed 40-page set of guidelines for developing presentations and a "ghost-sliding" process. Ghost sliding involved sketching a rough outline of the key slides that one wanted to include in the presentation. Each slide described one or more hypotheses and the desired data that would either support or disprove them. The rationale for ghost-sliding was that by developing explicit representations of what a consultant was striving for, the consultant could discuss the hypotheses with others and be more efficient about what kind of data to look for. Ghost sliding was an iterative process where consultants drew up quick, rough representations of each slide and discussed them with clients to develop consensus on what statements were going to be included in the final presentation and what data needed to be collected to support those statements. At DotOrg, ghost-slides were used by the Fellows and Consultants as structural referents of the ghost-sliding process.

The process by which the Web Developers created a new web prototype also involved creating and drawing on structural referents to enact a set of structures. The process was led by one of the web developers, in a manner similar to projects she had worked on within the Incubator and at her prior job. It included collaboratively defining a "look and feel" that would serve as a visual template for all the pages in the prototype; soliciting and developing a set of stories of how

⁵ In this paper, I treat each set as distinct for the purposes of describing the framework but in practice they are inter-related and difficult to consider separately.

potential users would engage with the service; and finally, creating one or more series of pages that, together, made up a story of a fictional user. The mutually agreed upon "look and feel" was used as a structural referent to guide the structuring of the layout of each web page.

Table 1 (following page) summarizes the process of creating a funding pitch and the process of developing a web prototype in terms of improvising. Those involved in those collaborative endeavors drew on structural referents to guide the process of assessing continuously, creating resourcefully and adapting extemporaneously. Improvising is also a useful lens for examining why collaboration was so difficult during the first stage of the process of developing a funding pitch. In structuring their improvising practices, participants drew on familiar structures. However, the structures did not necessarily complement each other.

Those involved with developing a funding pitch were only able to work successfully as a team during the last three weeks of the twelve-week project after spending the previous nine weeks struggling to develop consensus around DotOrg's strategic focus. The original set of structural referents that participants agreed to use to develop a funding pitch - specifically, the Consultants' guidelines for developing presentations, including the Ghost Sliding process - proved insufficient because they enacted those guidelines differently due to different understandings of DotOrg's identity. As a result, as Table 1 shows, during the first nine weeks, how the participants (however unintentionally) were essentially engaged in two conflicting improvisations.

4. The Essential Role of Project Identity

The findings from DotOrg suggest that having a set of complementary understandings regarding the purpose of the collective endeavor is an essential structure to the process of innovation - what I term *project identity*. Notions related to project identity have been discussed in research on collective action (e.g., Donnellon, Gray, and Bougon, 1986; Weick and Roberts, 1993), collective identity (Hardy et al., 2005) and organizational identity (e.g., Albert et al., 2000; Gioia et al., 2000; Glynn, 2000; Golden-Biddle and Rao, 1997; Hogg and Terry, 2000).

Donnellon, et al. (1986, p. 53) argue that "organizational members have two alternative sets of organizing tools at their disposal: (1) shared meanings and (2) shared communication mechanisms." When group participants do not have "shared meanings" or shared interpretations, they may engage in coordinated action by engaging in a set of communication practices that enable them to create "equifinal meanings." Equifinal meanings, they explain, are

Table 1: Examples of Improvising at DotOrg

Improvisation	Key Structural Referents	Assessing Continuously	Creating Resourcefully	Adapting Extemporaneously
<p>Developing a funding pitch Creating a funding pitch Stage 2</p> <p><i>Fellows, Consultants, and Advisors</i></p> <p><i>Founders</i></p> <p><i>Founders, Fellows, Consultants, and Advisors</i></p> <p>Creating a funding pitch Stage 2</p>	<p>Two groups of participants essentially engaged in two (unintentionally) competing and conflicting improvisations, each guided by a different project identity (DotOrg as a for-profit startup and DotOrg as a non-profit startup) ...</p> <p>For-profit structural referents (e.g., DotOrg as a for-profit startup, funding pitches and business models from for-profit companies, data on market and competition, assumptions about what is a viable startup)</p> <p>Nonprofit structural referents (e.g., DotOrg as a nonprofit startup; original business plan, data on market and competition, assumptions about what is a viable nonprofit startup)</p> <p>... until both groups converged around common project identity (DotOrg as a nonprofit startup)</p> <p>Nonprofit structural referents (e.g., DotOrg as a nonprofit startup, original business plan, data on market and competition, assumptions about what is a viable nonprofit startup)</p> <p>A complementary set of understandings regarding DotOrg's business model Ghost sliding process</p>	<p>Participants met regularly to report on emerging findings and discuss the identity of DotOrg</p> <p>Participants met regularly to report on emerging findings and discuss the identity of DotOrg</p> <p>The convergence occurred over a period of a few days, as the Founders met with all participants and solicited their feedback</p> <p>The Fellows solicited feedback from the Founders, Consultants, and Advisors, every time they made a significant change to the emerging funding pitch</p>	<p>The Fellows drew on course material from their MBA classes, resources at the Consulting Firm, and data from websites to piece together their reports arguing against the viability of DotOrg and their alternative business models</p> <p>The Founders drew on resources at the incubator and data from websites to piece together their arguments for the viability of DotOrg</p> <p>The Founders' argument of the viability of DotOrg's original business model was pieced together from the research that the Fellows had conducted</p> <p>The funding pitch was pieced together from the research that the Fellows had conducted</p>	<p>The Fellows adapted their findings and alternative business models after every meeting</p> <p>The Founders refined their views after every meeting</p> <p>Participants adapted their notions of DotOrg in accordance to the discussions from the past few days</p> <p>The Fellows were continuously changing the emerging funding pitch in response to feedback from team members</p>
<p>Developing a web prototype Constructing the demo</p> <p>Adapting the demo to attract first customer</p>	<p>A richer common understanding of DotOrg's business model The process by which web prototypes had been constructed for other startups The agreed-upon "look and feel" of the website A story developed by the Founders</p> <p>The first version of the web prototype Interests of potential customer</p>	<p>Web Developers talked at length with Founders about what "look and feel" they wanted and what story they wanted to convey. They also regularly solicited feedback from the Founders</p> <p>The development team interacted regularly with the potential customer to get a better sense of its interests</p>	<p>The demo was pieced together from images recycled from the web and graphics and html code originally developed at the incubator for other startups</p> <p>Images from potential customer's website recycled into demo</p>	<p>Throughout the process, the Web Developers changed the emerging web demo in response to feedback from the Founders</p> <p>The demo was adapted each time the development team learned more about the interests of the potential customer</p>

(Donnellon et al., 1986, p. 44): "interpretations that are dissimilar but that have similar behavioral implications." Achieving equifinal meanings does not require that participants achieve equal or overlapping understandings but rather, that they develop a set of complementary understandings that lead to coordinated actions.

Similarly, Hardy, Lawrence and Grant (2005), theorize a two-stage process for effective collaboration: in the first stage, participants discursively construct a "collective identity," and in the second stage, they translate through further conversations the collective identity into innovative and synergistic action. "Collective identity" - defined as a collection of relationships that connect participants to a common issue ("generalized ties") and relationships that connect participants directly to each other ("particularized ties") - is a fundamental and essential resource that participants construct and draw on by means of discursive practices.

Golden-Biddle and Rao (1997, p. 593), drawing on Albert & Whetten (1985), define "organizational identity" as the "members' shared beliefs about the central, enduring, and distinctive characteristics of the organization." Organizational identity is one of multiple identities (e.g., professional identities, organizational identities) that participants draw on to guide their activities as they navigate through a variety of social situations (Albert et al. 2000; Golden-Biddle and Rao, 1997). Organizational identity is a fluid, unstable, subjective, hybrid and dynamic construct that emerges from situated social interactions and is inseparable from either the actions that constitute and reconstitute it or the specific situations in which they take place (e.g., time, place, social, organizational, and political contexts, etc.) (Gioia et al., 2000; Hogg and Terry, 2000). Gioia et al. (2000, p. 79), for example, consider identity to be a "dynamic consistency" where the most stable aspect of identity are its labels, while interpretations of those labels are more dynamic.

Building on insights from such notions as "equifinal meanings" (Donnellon et al., 1986) and "collective mind" (Weick and Roberst, 1993) and from the literature on organizational identity (e.g., Albert et al., 2000; Gioia et al., 2000; Glynn, 2000; Golden-Biddle and Rao, 1997; Hogg and Terry, 2000), I propose that an important collective identity (Hardy et al., 2005) is "project identity" - the identity of the collective endeavor the group members are participating in. Similar to organizational identity, but at the scale of a group project, project identity is a complementary collection of mutually constituted, individually-held representations of a collective that simultaneously enables and constrains group interactions. To accomplish a project, each group member's notion of the project's identity must be complementary at a minimum level. Participants do not need to have the same image of the collective endeavor nor the same

identification with it, but their images must lead them to act in complementary ways. In this regard, project identity is a specific kind of "equifinal meaning" (Donnellon et al., 1986), "collective mind" (Weick and Roberts, 1993), or "collective identity" (Hardy et al., 2005) specifically focused on the activities pertaining to a group project, that serves as a "shared logic of exchange" (McGinn and Keros, 2004) to structure improvising. Usually, what exactly is shared between members regarding a project identity is assumed until it is required to be made explicit.

Project identity is a structure in the manner articulated by structuration theory (Giddens, 1984): structures are socially enacted and virtual (structures only exist as practiced and as memories of their instantiations), and structures and practices are mutually constitutive. A structural referent of project identity may be an image or model of the project that one refers to (either implicitly or explicitly) to guide, relate, and reflect on one's actions in relation to those of others in the group. However, a project identity does not reside in any single individual or artifact but, rather, it emerges from the interactions of individuals involved in a collaborative endeavor, and each time it gets enacted, it is open to change.

One aspect of project identity is the purpose of the project, which is related but distinct from project goals. As Katzenbach and Smith (1993, p. 49-55) note, the purpose of the project "sets the tone and aspiration" of a group, whereas goals define "team work-products" that help participants track progress. Team purposes, Katzenbach and Smith (1993, p. 53) argue, "give teams an identity that reaches beyond the sum of individuals involved."⁶ A mission statement or charter, for example, may articulate a group's purpose and values, but neither will ensure that participants accomplish either. Another aspect of project identity is the interests of the participants. The difference between project identity and goals is similar to the distinction made in negotiation theory between interests and positions. Interests are the underlying needs, desires, concerns and fears that participants care about and that motivate them to take specific positions in the negotiation (Fisher, Ury, and Patton, 1991; Lewicki et al., 1994; Thompson, 2001).

⁶ Katzenbach and Smith (1993) seem to assume that the team's identity, once established, is interpreted equally by all participants. I do not make such an assumption, as DotOrg's identity was always in flux and open to conflicting interpretations.

5. The Process of Enacting a Project Identity

What is the process by which project identity is enacted? Although researchers have alluded to the importance of project identity to collaborative endeavors, there is a dearth of research that examines the practices that constitute the process by which project identity is enacted. Hardy et al (2005) are a refreshing exception, as they address this issue theoretically. In this section, I argue that improvising is a helpful practice-based framework to describe empirically the process by which project identity is enacted.

As a fundamental structure to improvising, a significant process of enacting a project identity at DotOrg was improvising. As with the funding pitch or web prototype, significant instantiations of project identity occurred as improvisations. That is, the process of enacting project identity consists of enacting structures to guide three sets of activities: assessing continuously, creating resourcefully, and adapting extemporaneously.

At DotOrg, the identities of collaborative projects - most noticeably the funding pitch project - were inseparable from the identity of DotOrg. It was insufficient, for example, to simply agree that the purpose of the project was to develop a funding pitch. The funding pitch project also involved developing a minimum amount of consensus around the identity of DotOrg, since creating a funding pitch was essentially creating an image of DotOrg that would be attractive to potential funders so as to garner their financial support. Consequently, improvising the project's identity involved improvising DotOrg's identity.

Similarly, since the web prototype was to become another critical representation of DotOrg, the web prototype project was an important opportunity to refine and redefine DotOrg's identity. The identity of the web prototype project was to develop an attractive demonstration of DotOrg's services that would entice potential customers (i.e., nonprofits that ran special fundraising events) to subscribe to DotOrg's services. The Founders welcomed the Advisors' and Web Developers' input in refining and redefining DotOrg. As participants collected images and scripts from the web and previous projects and data from the funding pitch and other research, they recycled them and pieced together representations of services that DotOrg could potentially offer, discussed whether or not they were technically feasible, financially realistic, and in general, their implications to DotOrg, and then modified the pieced-together representations accordingly. In the process of improvising the web prototype, participants also enacted the project's identity, which was interrelated with DotOrg's identity.

These struggles highlighted several potential challenges to the process of enacting project identity, some of which have already been discussed by researchers in the area of organizational identity (e.g., Gioia et al., 2000; Glynn, 2000; Hogg and Terry, 2000; Hatch and Schultz, 2002; Ibarra, 1999). Although everyone involved with DotOrg wanted the startup to succeed, there were two different notions of what it meant for DotOrg to succeed, which became apparent from the respective actions and prescriptive statements of those subscribing to them.⁷ The Fellows, Consultants, and Incubator Advisor applied notions of success from the for-profit world to define success for DotOrg. They were focused, for example, on developing a business model for DotOrg that would generate enough money to be self-sustaining and dominate competitors. The Founders, on the other hand, defined success by how well they would accomplish their mission. They wanted to be as self-sustaining as possible, but most important, they wanted to help other nonprofits with special events. Overall, during the first stage of developing a funding pitch, two general project identities were enacted. Whereas the Fellows, Consultants, and Advisors enacted a for-profit project identity, the Founders enacted a nonprofit project identity. The differences between the two identities soon proved to be too significant to be constructive and participants struggled to resolve them. Each group was working off its own project identity and consequently, each group was improvising separately.

The process of developing an organizational identity can be thought of as a "claim-making process" regarding what is central, enduring, and distinctive about an organization, and it involves the "identity dynamics of professional and occupational groups" (Glynn, 2000, p. 295). This perspective is particularly helpful to making sense of the tensions that developed at DotOrg. Organizational identity affects and is affected by the perceptions of those participating in organizing the organization's core competencies, including strategic issues and resources (Glynn, 2000, p. 295). This is particularly notable when an organization is made up of individuals who identify with different communities of practice, as in DotOrg, where there were nonprofit entrepreneurs, for-profit entrepreneurs, and consultants. There is a tendency for each participant to act consistently with the legitimating values of the profession s/he identifies with

⁷ In fact, more specifically, team members basically fell into three different groups: those advocating a for-profit startup business model (the Greenhouse advisors); those advocating a for-profit well-established business model (the Consultants); and those advocating for a nonprofit startup model (e.g., the Founders and web developers). These differences were significant to both what kind of business model was advocated (for-profit versus nonprofit) and how to go about developing DotOrg ("quick-and-dirty," as if DotOrg were a startup, or detailed and well planned, as if it was a well established organization). For now, I focus on the for-profit versus nonprofit approaches (e.g., strive to make money versus strive to accomplish mission) because the differences between well-established model and startup models was resolved between the Consultants, Fellows, and Advisors a few weeks into the process.

(i.e., her/his professional identity).⁸ Consequently, in the process of identifying with an organization, as participants search for and define overlaps between their professional identity and an organization's identity, they tend to focus on organizational capabilities (and weaknesses) that validate their sense of professional self. When a group is composed of individuals who identify with different professions or occupations, "the construction of organizational problems may not be clear and uncontested, but rather marked by divergent and sometimes contentious claims, which spring from divergent ideologies held by groups who occupy different institutional positions" (Glynn, 2000, p. 294).

This was certainly the case with the group of individuals at DotOrg. As participants struggled to define a viable DotOrg, they struggled to define what was essential, as well as what was unique about DotOrg (Albert and Whetten, 1985). The participants from for-profit organizations (i.e., Consultants, Incubator Advisor) tended to focus on what was competitively unique about DotOrg. In fact, in developing alternative identities for DotOrg, they ended up changing several aspects of DotOrg that were essential to the Founders. The proposed alternatives proved to be contentious but helped make more explicit the differences among participants' understandings. Ultimately, the DotOrg team did not arrive at a single, homogeneous organizational identity but rather, after engaging in adjacent but separate improvisations and after engaging in discursive practices (Hardy et al. 2005), they reached a broader and more detailed common understanding that proved sufficient and necessary for the Fellows to apply the ghost-sliding process and develop a funding pitch.

Project identity, like other structures, was not enacted for the sake of enacting project identity, but rather, it was enacted as part of the process of improvising. And as with other structures, it was both a resource for improvising and a consequence of improvising.

6. The Roles of Technological Artifacts in Improvising a Project Identity

6.1 The Role of Technological Artifacts in Improvising at DotOrg

Whether improvising separately (as in the first stage of developing a funding pitch) or together, DotOrg participants drew on different types of technological artifacts. In developing the first version of the funding pitch, for example, the Fellows drew on DotOrg's original business plan for content (since by this point, participants had agreed that it was a viable model for DotOrg)

⁸ As Glynn (2000: 287) states: "Professionals have a stake in maintaining their identity in a professional field, and claiming a set of identity attributes that can be used to their advantage in society and/or in the marketplace of business."

and the Consulting Firm's presentation guidelines to structure the pitch; created hand drawn ghost slides using pen and paper to test ideas, solicit feedback, and make sure the emerging funding pitch was meeting expectations; and used electronic mail, instant messaging, cell phones, telephones, and fax machines to communicate with other team members (including an assistant at the Consulting Firm who translated the Fellows' faxed handwritten slides into PowerPoint slides formatted according to the 'look and feel' of the Firm).

Table 2 (following page) lists several examples of artifacts that were involved in improvisations at DotOrg. As it makes clear, technological artifacts were not simply stable tools (e.g., the use of computers to write a document). During these improvisations, there were at least two general kinds of technologies: *stable artifacts*, which did not significantly change during the improvisation (e.g., the walkie-talkies, furniture on wheels, computers) and *emergent artifacts*, which were created and adapted during the improvisation (e.g. the ghost-slides, the web prototype-in-progress). Both kinds of artifacts were used in three general ways ("roles"): as *tools*, where artifacts were used to construct the outcome (e.g., the use of computers for IM, e-mail, and creating Word documents); as *components*, where artifacts were used as components of the outcome (e.g., the use of graphic files to build the web prototype); and as *products*, where artifacts were used as outcomes of the improvising (e.g., the use of ghost-slides to represent latest version of funding pitch).⁹ Each role involved at least one of two aspects of an artifact: *practical* and *symbolic*. Involving an artifact for its practical aspect refers to using the functional properties of an artifact (e.g., using a chair to sit on). Involving an artifact for its symbolic aspect refers to using the representational properties of an artifact, without necessarily depending on an artifact's functional capabilities (e.g., using a chair to represent status).¹⁰

With the notable exception of Pratt and Rafaeli's (2001) work on physical symbols, the relationship between the use of artifacts and the process of enacting identity has not been explored. However, due to space constraints, I will focus the remaining paper on the role of emergent artifacts in improvising a project identity. Because project identity is an essential structure of improvising, describing the roles of emergent artifacts in improvising project identity provides specific examples and core insights to the broader question regarding the roles of artifacts in improvising.

⁹ Another way to consider these three different roles is the use of technology as part of the process ("tool"), the use of technology as part of the content ("component"), and the use of technology as an outcome of the process ("product").

¹⁰ These categories are described in greater detail in Fonstad (2003).

Table 2: Examples of artifacts and associated uses at DotOrg

Artifact	Artifact-in-use	Kind of artifact	Primary role of artifact	Primary aspect of artifact used
computers	The use of computers as a communication tool and to maintain distance and proximity (e.g., instant messaging).	Stable	Tool	Practical
laptops	The use of a laptop to write Word documents in a cafe	Stable	Tool	Practical
walkie-talkies	The use of walkie-talkies to locate colleagues and to communicate.	Stable	Tool	Practical
pre-designed computer graphics (e.g., DotOrg logo, stock photographs, pictures from GCF website)	The use of pre-designed computer graphics as elements of a web prototype.	Stable	Component	Practical
furniture on wheels	The use of furniture from one office space in another space, so that more people could participate in a meeting.	Stable	Tool	Practical
furniture on wheels	The use of furniture to represent Greenhouse's philosophy (fluidity) and access to resources	Stable	Tool	Symbolic
funding pitch	The use of the funding pitch to guide the development of the web prototype.	Stable	Component	Symbolic
web prototype	The use of the web prototype to guide the development of DotOrg's web-based service.	Stable	Component	Symbolic
placemat with original ideas for DotOrg	The use of the placemat to remind Founders original intentions of DotOrg.	Stable	Tool	Symbolic
static sheets (general)	The use of static sheets to write and organize ideas and to preserve and transport what was written.	Stable	Tool	Practical
static sheets with writing	The use of static sheets that had been written on to remind one of what had been discussed.	Emergent	Product	Symbolic
ghost-slide packet (hand written)	The use of hand-written ghost slides to represent the process thus far.	Emergent	Product	Symbolic
ghost-slide packet (hand written and formatted)	The use of ghost slides to write down changes in pencil.	Emergent	Tool	Practical
web prototype-in-progress	The use of the web prototype-in-progress to solicit feedback.	Emergent	Product	Practical

6.2 Creating Emergent Artifacts as Representations of Identity

From the moment DotOrg was first conceived and Margaret sketched the initial business plan onto the back of a paper placemat, emergent artifacts played a significant role in the development of DotOrg. As DotOrg evolved, Margaret kept the placemat and used during challenging times as a reminder of what originally motivated the development of DotOrg.

The processes of developing a funding pitch and developing a web prototype were essentially examples of developing images of DotOrg to use to convince others that DotOrg was an organization that was worth funding and partnering with. Participants were essentially engaged in "cultural entrepreneurship" - the narrative process by which entrepreneurs craft new venture identities (i.e., stories) to earn legitimacy from investors, competitors, and consumer, and consequently, increase their access to new capital and market opportunities (Lounsbury and Glynn, 2001:545). Participants created tangible representations of DotOrg (e.g., in the form of ghost slides, static sheets with writing, the emerging web prototype) and used them to elicit and develop new knowledge, assess progress (or lack thereof), bridge temporal and occupational boundaries, and structure the ongoing process.

These uses resonate with director Federico Fellini's use of sketches. In an interview about the role of drawings in the making of movies, Fellini described the key role of sketches, doodles, and drawings to communicate his ideas, coordinate his collaborators, and anchor his imagination (Meglin, 2001:8-9):

I make sketches, designs, figures, in an attempt to fix and visually clarify a setting, a situation, a character, the costume of a certain personage, a feeling. This casual material, these "wind birds" (usually done on scrap paper, backs of envelopes, and so on) serve as signposts to orient my collaborators: the scene designer, costume artists, makeup man, and so forth [...] [Drawing] is only an instrument, a means, a link in the chain by which fancy and imagination are anchored in a cinematic result.

Similarly, at DotOrg, emergent artifacts were essentially used as boundary objects. Research on metaphors (Hill and Levenhagen, 1995; Morgan, 1980; Morgan, 1986), boundary objects (Bechky, 2003; Carlile, 2001; Henderson, 1995, 1998; Levina, 2001), single-text strategy (Fisher, 1978; Fisher and Ury, 1991; Raiffa, 1982; Susskind and Cruikshank, 1987; Thompson, 2001), and physical symbols (Pratt and Rafaeli, 2001) has examined the use of objects to span boundaries and develop a (new) common understanding between users. These objects range from conceptual objects (e.g., metaphors) to tangible objects (e.g., written documents). Participants from different occupational communities, for example, may try to overcome differences in understanding by transforming their understanding through the use of artifacts as

boundary objects to "[co-create] common ground" that relates understandings to each other (Bechky, 2003). Henderson (1998:146), finds boundary objects (e.g., prototypes) are used for eliciting and capturing ("conscripting") tacit knowledge, garnering support or project buy-in ("support networks"), controlling "who is permitted to have input into the new design process" ("gate keeping") and as reference points for negotiations.

At DotOrg, there were several examples of emergent artifacts that were created and adapted for similar uses. For example, one of the Web Developers explained to me, the web prototype was created as way to get buy in from potential customers:

The objective here is to produce a presentation that ... [would] appeal to the hearts and minds of venture philanthropists to get them to fund [DotOrg]. And we wanted to not spend much money in order to do that. But also, because a picture is worth a thousand words, it's just so much faster to take somebody through a prototype and communicate user experiences and functionalities in an image than by standing there and talking to them [...] It's just a great communications tool. Not only for venture philanthropists. Whomever you need to introduce this concept to, it becomes a really recyclable tool to communicate what the product vision is.

In addition to serving as boundary objects, emergent artifacts served a role in structuring the ongoing process (an aspect of boundary objects that the literature has not explored in detail). More specifically, as tangible representations, emergent artifacts played a critical role as structural referents - both within an improvisation and across different improvisations. For example, DotOrg's original business plan was an important structural referent in developing the funding pitch; the final version of the funding pitch was an important structural referent in developing the web prototype; and the final version of the web prototype was an important structural referent in constructing DotOrg's web-based service. As one of the Founders explained:

It's cool because now we can take this prototype - and this is only something that became apparent [a few weeks ago...] - as a guide to show people this is what we want to do And it's easier than explaining to them. Because we don't necessarily understand all the components that go on the back-end. So by looking at it they can say 'Oh, you'll need this, this and that...'

The first nine weeks of the Fellows' engagement (during which many emergent artifacts were created and used) highlight that simply having an emergent artifact does not ensure successful collaboration. The value of emergent artifacts emerges from *how* they are created and used. For example, early during their engagement, the Fellows developed detailed interview guides to elicit and develop new knowledge regarding the competitive landscape and potential market. These guides and the reported results, though, were initially structured to assess the for-profits

aspects of a business. Because of the lack of structure during the initial stages of the development process, emergent artifacts significantly structured the ongoing process. Because the Fellows and Consultants produced most of the emergent artifacts, their interests - rather than those of the Founders - structured the ongoing process.

The concreteness of artifacts, can be misleading. On several occasions, particularly during the first weeks of the funding pitch project, the Consultants believed that whatever they wrote on the whiteboards was understood equally by all participants in the room. That is, they did not seem to consider the equivocality of their representations, and instead, seemed to assume that developing a common representation meant developing a common understanding. To their frustration, however, they soon realized that the shared witnessing of making ideas concrete on the white board and static sheets did not guarantee a shared understanding or collective subscription to their proposals.

Meanings are not embedded in artifacts but, rather, are socially ascribed and constructed, depending on how physical symbols are combined, how actors use them, and the contexts in which they are used (Gioia et al., 2000; Orlikowski, 2000; Pratt and Rafaeli, 2001; Weick 1990). The founders of Greenhouse, for example, invested resources into developing an interior design of the space made up of several artifacts (e.g., office equipment on wheels, partitions between offices that could slide open, conference room with Aeron chairs, kitchen with top of the line equipment, common area with foosball table, etc.) that represented wealth, "cool," flexibility, fluidity, and collaboration, and enabled users to engage in all those aspects as they sought to launch their startups. These same artifacts, however, came to symbolize excessive spending as users engaged with them and the market declined. The context and use of physical symbols inform the meanings associated with them and vice versa.

In addition, as tangible representations, emergent artifacts are equivocal - i.e., open to a variety of interpretations (Gioia et al., 2000; Pratt and Rafaeli, 2001; Weick 1990). The equivocality of emergent artifacts is both enabling and constraining. For example, the business plan and presentation that the Founders of DotOrg created and used to win the business plan competition were two critical representations of DotOrg's identity. They were used to earn the support of Greenhouse, the Consultants, and the Fellows. Based on those representations (and some brief conversations with the Founders) each party decided to be part of the DotOrg team and help DotOrg become "successful." The representations proved to be ambiguous, however, as it became apparent throughout the process of developing the funding pitch that each party had conflicting images of a "successful DotOrg." The ambiguity of the business plan and

presentation enabled the Founders to win the support of Greenhouse, the Consultants, and the Fellows (and all the prestige associated with their support), but their conflicting views regarding what constituted a successful and viable DotOrg proved also to be a constraint.

7. Conclusion

In this paper, I describe the roles of emergent artifacts in the process of enacting project identity. Specifically, I show how participants, during the first months of working at a nonprofit internet startup, engaged a variety of artifacts during the innovation processes that constituted their collective endeavors. Amongst these artifacts were several that participants created and adapted ("emergent artifacts") and used to structure their improvisations, assess the situation, piece together solutions, and modify them in the moment. Conflicts during the first nine weeks of a twelve week project highlighted an essential (but often taken for granted) aspect of collaborative endeavors: participants must draw on a set of complementary understandings regarding the purpose of their collective endeavor - i.e., they must enact a project identity. Drawing on structuration theory (Giddens, 1984), I argue that improvising is a process that describes both how participants draw on project identity as a resource for their collaboration and how they enact project identity. The use of technological artifacts (both stable and emergent) is integral to improvising, including project identity. Participants at DotOrg, for example, created and used artifacts as representations and components of identity. They also realized that these representations were equivocal. The equivocality of artifacts enabled participants with differing understandings to develop a project identity and to structure and coordinate their activities around a common artifact without having to reach equal understandings. The simple presence of emergent artifacts did not guarantee success, however. Artifacts were used to structure the process in a manner that excluded the views of some participants and, unintentionally, mask differences that proved significant later on in the process.

With the recent exception of one theoretical paper (Hardy, Lawrence, and Grant, 2005), researchers have not examined the practices that constitute project identity. This paper contributes to research on organizations by empirically demonstrating the critical role of identity to the process of group innovation and by describing the practices that constitute the process by which project identity is enacted. In addition, although a few several researchers have noted the importance of technological artifacts to project identity, none have examined the role of artifacts in relation to the practices that constitute project identity. I also address calls for IS researchers to theorize more specifically about the nature and influence of IT artifacts (Benbasat and Zmud, 2003; Orlikowski and Iacono, 2001) and offer a framework to think about technology not simply

as a stable tool that is used for practical purposes, but also as an artifact that can be stable or emergent, that can be used as a product, component, or tool, and that can be used for both practical and symbolic aspects in the process of improvising a project identity.

References

- Albert, S. and Whetten, D.A. (1985). "Organizational identity." *Research in Organizational Behavior*. 7, 263-295.
- Albert, S., Ashforth, B., and Dutton, J. (2000). "Organizational identity and identification: charting new waters and building new bridges." *Academy of Management Review*. 25(1), 13-17.
- Arnett, J. and Arnett, W. (2002). *The quilts of Gee's Bend*. Tinwood Books: Atlanta, GA.
- Arrow, H., McGrath, J.E., and Berdahl, J.L. (2000). *Small groups as complex systems: Formation, Coordination, Development, and Adaptation*. Sage Publications: Thousand Oaks, CA.
- Barley, S.R., and Kunda, G. (2001). "Bringing work back in." *Organization Science*. 12(1), January-February, 76-95.
- Barrett, F. (1998). "Creativity and improvisation in jazz and organizations: Implications for organizational learning." *Organization Science*. 9(5), 605-622.
- Barrett, F. and Peplowski, K. (1998). "Minimal structures within a song: An analysis of 'All of Me'." *Organization Science*. 9(5) 558-560.
- Bastien, D. and Hostager, T. (1988). "Jazz as a process of organizational innovation." *Communication Research*. 15(5), 582-602.
- Benbassat, I. and Zmud, R.W. (2003). "The identity crisis within the IS discipline: Defining and communicating the discipline's core properties." *MIS Quarterly* 27(2). June, 2003, 183-194.
- Benberry, C. (1992). "Always there: The African-American presence in American quilts." The Kentucky Quilt Project, Inc.
- Berliner, P.F. (1994). *Thinking in jazz: The infinite art of improvisation*. Chicago:Ill. The University of Chicago Press.
- Beyer, J. and Hannah, D. (2002). "Building on the past: enacting established personal identities in a new work setting." *Organization Science*. 13(6), 636-652.
- Brown, S. and Eisenhardt, K. (1997). "The art of continuous change: Linking complexity theory and time-paced evolution in relentlessly shifting organizations." *Administrative Science Quarterly*. 42(1), 1-34.
- Cash, F. (1995). "Kinship and quilting: An examination of an african-american tradition." *Journal of Negro History*. 80(1), 30-41.
- Ciborra, C. (1996). "Improvisation and information technology in organizations." in J. DeGross, S. Jarvenpaa and A. Srinivasan (Eds.) *Proceedings of the Seventeenth International Conference on Information Systems*. December 16-18.
- Ciborra, C. (1999). "Notes on improvisation and time in organizations." *Accounting, Management & Information Technology*. 9, 77-94.
- Crossan, M.M., Lane, H.W., White, R., Klus, L. (1996). "The improvising organization: Where planning meets opportunity." *Organizational Dynamics*. 24(4), 20-35.
- Crossan, M.M., Lane, H.W., and White, R.E. (1999). "An organizational learning framework: From intuition to institution." *Academy of Management Review*. 24(3), 522-537.
- Crossan, M.M., Cunha, M.P., Vera, D., and Cunha, J. (2005). "Time and Organizational Improvisation." *The Academy of Management Review*. 30(1), 129-145.
- Crossan, M.M. (1998). "Improvisation in action." *Organization Science*. 9(5), 593-599.

- Donnellon, A. Gray, B. and Bougon, M.G. (1986). "Communication, meaning, and organized action." *Administrative Science Quarterly*. 31(1). 43-55.
- Dougherty, D. (1992). "Interpretive barriers to successful product innovation in large firms." *Organization Science*. 3(2), 179-202.
- Dukerich, J.M., Golden, B.R., and Shortell, S.M. (2002). "Beauty is in the eye of the beholder: The impact of organizational identification, identity, and image on the cooperative behaviors of physicians." *Administrative Science Quarterly*. 47(3), 507-533.
- Dutton, J.E., Dukerich, J.M., and Harquail, C.V. (1994). "Organizational images and member identification." *Administrative Science Quarterly*. 39, 239-263.
- Eisenberg, E. (1990). "Jamming: Transcendence through organizing." *Communication Research*. 17(2), 139-164.
- Eisenhardt, K.M. (1991). "Better stories and better constructs: The case for rigor and comparative logic." *Academy of Management Review*. 16(3), 620-627.
- Fiol, C.M. (2002). "Capitalizing on paradox: the role of language in transforming organizational identities." *Organization Science*. 13(6), 653-666.
- Foreman, P. and Whetten, D.A. (2002). "Members' identification with multiple-identity organizations." *Organization Science*. 13(6), 618-635.
- Fonstad, N. (2003). "Understanding the roles of technology in improvising." unpublished Ph.D. Dissertation, Massachusetts Institute of Technology.
- Garud, R. and Karnøe, P. (2003). "Bricolage versus breakthrough: Distributed and embedded agency in technology entrepreneurship." *Research Policy*. 32, 277-300.
- Giddens, A. (1984). *The constitution of society: Outline of the theory of structure*. Berkeley, CA: University of California Press.
- Gioia, D.A., Schultz, M., and Corley, K.G. (1999). "Organizational identity, image, and adaptive instability." *Academy of Management Review*. 25(1), 63-81.
- Glazer, B.G. and Strauss, A.L. (1967) *The discovery of grounded theory; strategies for qualitative research*, Chicago, IL: Aldine Pub. Co.
- Golden-Biddle, K. and Rao, H. (1997). "Breaches in the boardroom: organizational identity and conflicts of commitment in a nonprofit organization." *Organization Science*. 8(6), 593-611.
- Glynn, M.A. (2000). "When cymbals become symbols: conflict over organizational identity with a symphony orchestra." *Organization Science*. 11(3), May-June 2000, 285-298.
- Hackman, J.R.. (1990). *Groups that work (and those that don't): creating conditions for effective teamwork*. J. Richard Hackman, Ed. Jossey-Bass Inc., Publishers: San Francisco, CA.
- Hardy, C., Lawrence, T.B., and Grant, D. (2005). "Discourse and Collaboration: The Role of Conversations and Collective Identity." *The Academy of Management Review*. 30(1), 58-77.
- Hatch, M.J. (1998). "Jazz as a metaphor for organizing in the 21st century" *Organization Science*. 9(5), 565-567.
- Hatch, M.J. (1999). "Exploring the empty spaces of organizing: How improvisational jazz helps redescribe organizational structure." *Organization Studies*. 20(1), 75-100.
- Hatch, M.J. and Schultz, M. (2002). "The dynamics of organizational identity." *Human Relations*. 55(8), 989-1018.

- Hill, R.C. and Levenhagen, M. (1995). Metaphors and mental models: sensemaking and sensegiving in innovative and entrepreneurial activities." *Journal of Management*. 21(6), 1057-1074.
- Hughes, L. (1982). *The first book of jazz*. Hopewell, NJ: The Ecco Press. (originally published 1955).
- Humphreys, M. and Brown, A.D. (2002). "Narratives of organizational identity and identification: a case study of hegemony and resistance." *Organization Studies*. 23(3), 421-447.
- Ibarra, H. (1999). "Provisional selves: experimenting with image and identity in professional adaptation." *Administrative Science Quarterly*. 44(4), 764-791.
- Jorgensen, D.L. (1989). *Participant observation: A methodology for human studies*. Applied Social Research Methods Series: Vol.15. Sage Publications: Newbury Park, CA.
- Judd, C.M, Smith, E.R., and Kidder, L.H. (1991). *Research methods in social relations, 6th Ed*. Harcourt Brace Jovanovich College Publishers. New York:NY.
- Kamoche, K. and Cunha, M. (2001). "Minimal structures: From jazz improvisation to product innovation." *Organization Studies*. 22(5), 733-764.
- Klein, G.A. (1993). "A recognition-primed decision (RPD) model of rapid decision making." In Klein, G.A., J. Orasanu, R. Calderwood, and C.E. Zsombok (Eds.) *Decision making in action: Models and methods*. Ablex Publishing Corp: Norwood, NJ. 138-147.
- Kramer, R.M., Hanna, B.A., Su, S., and Wei, J. (2001). "Collective identity, collective trust, and social capital: Linking group identification and group cooperation." in *Groups at work: Theory and research* (M.E. Turner, Editor). Manhaw, New Jersey: Lawrence Erlbaum Associates, Publishers.
- Levi-Strauss, C. (1966). *The savage mind (La pensee suavage)*. London, UK: Weidenfeld and Niolson.
- Levina, N. (2001). "Multi-party information systems development: The challenge of cross-boundary collaboration." unpublished Ph.D. Dissertation, Massachusetts Institute of Technology.
- Levina, N. (2002). "Collaborative practices in information systems development: A collective reflection-in-action framework," Proceedings of the 23rd International Conference of Information Systems.
- Lounsbury, M. and Glynn, M.A. (2001). "Cultural entrepreneurship: stories, legitimacy, and the acquisition of resources." *Strategic Management Journal*. 22, 545-564.
- Marzio, P. (2002). "Foreword." in J. Beardsley, W. Arnett, P.Arnett, and J. Livingston (Eds.)*The quilts of Gee's Bend*. Atlanta: GA. Tinwood Books.
- McGinn, K.L. and Keros, A.T. (2002). "Improvisation and the logic of exchange in socially embedded transactions." *Administrative Science Quarterly*. 47(3). 442-473.
- Meglin, N. (2001). *Humorous illustration: Top artists of our time talk about their work*. New York: NY. Watson-Guptill Publications.
- Miner, A., Bassoff, P., and Moorman, C. (2001). "Organizational improvisation and learning: A Field Study." *Administrative Science Quarterly*. 46(2), 304-337
- Mirvis, P. (1998). "Practice improvisation." *Organization Science*. 9(5), 586-592.
- Moorman, C and Miner, A. (1998). "Organizational improvisation and organizational memory." *Academy of Management Review*. 23(4), 698-723.
- Morgan, G. (1986). *Images of Organization*. Sage Publications: NY, NY.

- Morgan, G. (1980). "Paradigms, metaphors, and puzzle solving in organization theory." *Administrative Science Quarterly*. 25(4), 605-622.
- Orlikowski, W.J. (1993). "CASE Tools as organizational change: Investigating incremental and radical changes in systems development." *MIS Quarterly*, 309-340.
- Orlikowski, W.J. (1996). "Improvising organizational transformation over time: A situated change perspective." *Information Systems Research*. 7(1), 63-92.
- Orlikowski, W.J. (2000). "Using technology and constituting structures: A practice lens for studying technology in organizations." *Organization Science*. 11(4), 404-428.
- Orlikowski, W.J. (2002). "Knowing in practice: Enacting a collective capability in distributed organizing." *Organization Science*. 13(3), 249-273.
- Orlikowski, W.J. and Barley, S.R. (2001). "Technology and institutions: What research on information technology and research on organizations learn from each other?" *MIS Quarterly*. 25(2), 145-165.
- Orlikowski, W.J. and Iacono, C.S. (2001). "Desperately seeking the 'IT' in IT research: A call to theorizing the IT artifact." *Information Systems Research*.
- Pratt, M.G. and Rafaeli, A. (2001). "Symbols as a language of organizational relationships." *Research in Organizational Behavior*. 23, 93-132.
- Raiffa, H. (1982). *The art and science of negotiation*. Harvard University Press: Cambridge, MA.
- Rubin, J.Z. and B.R. Brown. (1975). *The social psychology of bargaining and negotiation*. Academic Press: New York, NY.
- Susskind, L. and J. Cruikshank. (1987). *Breaking the impasse: consensual approaches to resolving public disputes*. Basic Books, Inc.: New York, NY.
- Thompson, L. (2001). *The mind and heart of the negotiator*. Prentice-Hall: Upper Saddle River, NJ.
- Vera, D. and Crossan, M. (2001). "Improvisation: A conceptual model of its dimensions and its impact on group performance." draft. July, 2001.
- Weick, K.E. (1990). "Technology as equivoque" Sensemaking in new technologies." in P.S. Goodman and L. Sproull (Eds.), *Technology and organizations*. San Francisco: Jossey-Bass. 1-44.
- Weick, K.E. (1993a). "The Collapse of Sensemaking in Organizations: The Mann Gulch Disaster." *Administrative Science Quarterly*. 38, 628-652.
- Weick, K.E. (1993b). "Organizational redesign as improvisation." *Organizational change and redesign* G.P. Huber & W.H. Glick (Eds.). Cary, NC: Oxford University Press, 346-379.
- Weick, K.E. (1995). *Sensemaking in Organizations*. Thousand Oaks, CA: Sage Publications.
- Weick, K.E. (1998). "Improvisation as a mindset for organizational analysis." *Organization Science*. 9(5), 540-555.
- Weick, K.E., and Roberts, K.H. (1993). "Collective Mind in Organizations: Heedful Interrelating on Flight Decks." *Administrative Science Quarterly*. 38, 357-381.
- Wenger, E. (1998). *Communities of Practice: Learning, Meaning and Identity*. Cambridge, UK: Cambridge University Press.
- Zack, M. (2000). "Jazz improvising and organizing: Once more from the top." *Organization Science*. 11(1), 227-234.