

The Contradictory Influence of Social Media Affordances on Online Communal Knowledge Sharing

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The use of social media creates the opportunity to turn organization-wide knowledge sharing in the workplace from an intermittent, centralized knowledge management process to a continuous online knowledge conversation of strangers, unexpected interpretations and re-uses, and dynamic emergence. We theorize four affordances of social media representing different ways to engage in this publicly visible knowledge conversations: metavoicing, triggered attending, network-informed associating, and generative role-taking. We further theorize mechanisms that affect how people engage in the knowledge conversation, finding that some mechanisms, when activated, will have positive effects on moving the knowledge conversation forward, but others will have adverse consequences not intended by the organization. These emergent tensions become the basis for the implications we draw.

Key words: social media, affordances, online knowledge sharing

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Introduction

Researchers have long argued that knowledge about work tasks, products, services, competitors, customers, and expertise is an increasingly valuable resource that needs to be shared broadly throughout the organization (Grant, 1996). Recent years have seen the evolution of a new generation of computer-mediated communication (CMC) tools, commonly referred to as social media, which provide new capabilities by which broad knowledge sharing within an organization can be fostered (boyd & Ellison, 2007). We use the term social media to refer to a group of Internet-based technologies that allows users to easily create, edit, evaluate, and/or link to content or to other creators of content (c.f., Kaplan & Heinen 2010). These new capabilities are currently embodied in such technologies as microblogging (such

as employee uses of Twitter or Chatter), wikis, RSS feeds, social tagging, innovation challenges, and electronic social networks.

The use of social media tools to facilitate knowledge sharing broadly throughout an organization is growing (Kane, Majchrzak & Ives, 2010; Treem & Leonardi, 2012). As of 2012, four out of five companies are using social technologies at varying stages of maturity (Overby, 2012), and 86% of managers believe that social media will be important to their business in 3 years (Kiron, Palmer, Phillips & Kruschwitz, 2012). While a third of the adopters are just getting their use off the ground with pilots, a majority of the adopters are now using social media tools to varying degrees in cross-functional knowledge sharing.

Knowledge workers are not simply users of these tools, but creators of content for their organizations including publishing blogs, upload videos, update status on Twitter and/or social networking sites, posting ratings of products or services, commenting on someone else's blog, contributing to online forums or wikis, using RSS feeds, adding tags to web pages, and maintaining their own social network profiles within the organization. This content creation broadly distributes knowledge beyond projects or known co-workers, but allow knowledge to be shared broadly to strangers throughout the organization and with the organization's ecosystem. IBM, for example, considers its use of social networking tools among its 400,000 employees to be absolutely germane to its dual focus of enterprise-wide collaboration and innovation (Majchrzak, Cherbakov & Ives, 2009).

Yet, little is known about how these social media technologies may change the way individuals are *engaged* in the way knowledge is shared across the organization, i.e., in the behavioral actions that individuals take to make their knowledge publicly visible throughout the organization (Kane et al, forthcoming). We specifically focus on engagement since, with social media tools, knowledge workers are able to make their knowledge publicly visible not simply in teams or with known others, but more importantly with unknown others (Majchrzak, Wagner, and Yates, forthcoming). Moreover, with social media tools, knowledge is made publicly visible not necessarily through a pairwise communication, but rather by posting knowledge in a collective good such as a tweet or blog (Fulk & Yuan, 2013), with future recipients of the knowledge able to interpret, modify, and use the knowledge as they wish. We refer to this process of making one's knowledge publicly visible as 'knowledge-sharing engagement.' Hence, we address the following question in this paper: *How could knowledge knowledgesharing engagement in the workplace be changed with the use of social media?*

An Affordance Lens

We take an affordance lens in our analysis of the role of social media technology enactment in knowledge sharing processes. We define technology affordance as *the mutuality of actor intentions and technology capabilities that provide the potential for a particular action* (Faraj & Azad, 2012). The concept of an affordance refers to the *action potential* that can be taken given a technology (Gibson, 1979; Hutchby, 2001; Leonardi, 2011; Majchrzak & Markus, 2013). The affordance lens forces the researcher to consider the symbiotic relationship between the action to be taken in the context and the capability of the technology (Lee, 2010; Maier & Fadel, 2009; Norman, 2007; Zammuto, Griffith, Majchrzak, Dougherty & Faraj, 2007). By treating the entanglement between the human action and the technological capability as a unit of analysis, the affordance perspective provides a language for beginning to examine social media and its role in affecting the process of online knowledge sharing (Faraj & Azad, 2012). Our use of the term affordance is in line with Earl and Kimport's (2011) focus on the contextualized actions that a technology makes qualitatively easier. Like those authors, we believe that the lens of affordances is best anchored, not as latent capability innate to the technology, but as a potentiality that only exists when leveraged within a specific domain and set of actions.

Describing social media's role from an affordance perspective provides several advantages for theory development (Treem & Leonardi, 2012). We focus on one of these advantages in particular: the identification of patterns of the symbiotic relationships that avoids privileging any single component of a sociotechnical system over any other component in explaining behavior. We build on Treem and Leonardi's (2012) exposition of four affordances of social media use in organizations that provide the basis for what we refer to as the shift from online knowledge sharing to online communal knowledge conversations. We then articulate four social media affordances that affect communal knowledge conversations, pointing out that these affordances have both positive and negative effects on the conversations.

From Online Knowledge Sharing to Online Communal Knowledge Conversations

Historically, organization-wide knowledge sharing has been handled by subgroups who do not generally share their knowledge throughout the organization (e.g., discussion forum, communities of practice), or with the use of a centralized intermittent process of either managers moderating organization-wide discussions or constructing and populating repositories (Alavi & Leidner, 2001; Bock, Zmud, Kim & Lee, 2005; Kankanhalli, Tan, & Wei, 2005; Fulk & Desanctis, 1995; Fulk & Yuan, 2013; Majchrzak, et al, forthcoming). Social media allow the online knowledge sharing process to shift from a centralized to a decentralized process, as individuals can post information whenever they want in both informal and formal ways (Kane & Fichman, 2009). Social media allow the knowledge sharing process to move from intermittent to continuous, as individuals can engage in ongoing conversations through organizational activity streams (Ellison and Boyd, 2013; Kane et al., forthcoming; Treem & Leonardi, 2012). Finally, social media allow the knowledge sharing process to shift from users consciously populating preconstructed repositories to emergent knowledge contributions as unplanned connections evolve as individuals use social media to share knowledge (Faraj, Jarvenpaa & Majchrzak, 2011; Treem & Leonardi, 2012).

We label this shift from centralized to decentralized, from intermittent to continuous, and from repository-based to emergent knowledge sharing in organizations as the *shift from online knowledge sharing to continuous online communal knowledge conversations*. Our emphasis in this paper is in identifying particular patterns of social media affordances that foster employee engagement in continuous communal knowledge conversations in the workplace. In the spirit of the Cook and Brown (2001) concept of knowledge sharing as a “generative dance” between knowing and knowledge, we define continuous communal conversations as those taking place online, in which posted knowledge becomes knowing through reuse, recontextualization, and reconstitution by knowledge workers across the organization. We label the online posts as “conversations” to indicate their dynamic, decentralized, and emergent nature. We label them “communal” because they are publicly visible for all to see (Kane et al., forthcoming; Kane & Fichman 2009; Treem & Leonardi, 2012). Finally, we label them as continuous because the persistence allows for the reuse to occur asynchronously even as players change (Fulk & Yuan, 2013; Treem & Leonardi, 2012). As an illustrative example, knowledge workers could broadcast online problems they are experiencing using Twitter, which starts a conversation among other workers at the company who have not previously met to quickly fix the problem and then shifts the discussion of the fix to a wiki platform where the more complex issue of how to avoid the problem from surfacing in the future becomes the focus of a communal conversation (Wagner and Majchrzak, 2006). Another illustrative example is one in which social media are used to evolve, forge consensus, and then document an upcoming event for the organization (Majchrzak, et al. forthcoming). Knowledge workers can join and leave a range of different conversations any day, any time, depending on their

work needs. In sum, the concept of communal knowledge conversations is intended to convey the fluidity, emergence, continuity, and unpredictability that comes from the generative dance between knowing and knowledge (Faraj, et al., 2011; Kane et al., 2010).

Below, we describe four affordances of social media representing different ways that employees can engage in ongoing organization-wide communal knowledge conversations: *metavoicing*, *triggered attending*, *network-informed associating*, and *generative role-taking*. For each affordance, we identify the theoretical mechanisms through which these affordances affect the nature of the engagement. We find from this examination that for all four affordances, mechanisms can be activated that may affect the knowledge conversation in a productive manner (i.e., one in which quality knowledge sharing occurs); however, simultaneously, mechanisms may be activated that have inadvertently negative effects on the knowledge conversation.

Affordances Affecting Forms of Engagement in Knowledge Conversations

We identify four affordances of social media that affect the way that employees engage in online communal workplace conversations: metavoicing, triggered attending, network-informed associating, and generative role-taking.

Metavoicing

We define the affordance of metavoicing as engaging in the ongoing online knowledge conversation by *reacting online to others' presence, profiles, content and activities*. We refer to this affordance as metavoicing, rather than voicing, because the individual is not simply voicing his or her opinion, but adding metaknowledge to the content that is already online. Metavoicing can take many forms including retweeting, voting on a posting, commenting on someone's post, voting on the comment, "liking" a profile, etc.

Metavoicing is made possible in social media through a variety of technology capabilities and has been documented in a variety of organizations (Gray, Parise & Eyer, 2011; Majchrzak, et al, 2009). For example, an employee may react by demonstrating support of another's comment when that individual retweets the other's message posted on Twitter (Chen, 2011). An individual may react to others' content by promoting the content through an "up" vote on a work portal that aggregates newsfeeds related to the work, (Koroleva, Stimac, Krasnova, & Kunze, 2011). An employee may react to others' content by adding tags that expand the application of an idea or document (Gray, et al., 2011). Metavoicing is particularly popular among firms engaged in ongoing knowledge conversations with their customers since customers are able to share not simply their ideas with the organization, but also their reactions to others' ideas (Di Gangi, Wasko, & Hooker, 2010; Gallaughier & Ransbotham, 2010).

These forms of metavoicing may help direct others to particularly exciting ideas in innovation challenges or particularly useful knowledge in knowledge repositories (Majchrzak, et al., forthcoming, 2012). As more employees metavoice about the content, such as through voting and polling, the general preference of the work community becomes more apparent. When decisions need to be made in the workplace, this general polling of the workforce may be exceedingly helpful and create a conversation concerning the decision that incorporates more diverse opinions than otherwise would have surfaced. For example, the CEO of EMC², a multinational technology corporation with over 45,000 employees worldwide, encouraged employees to metavoice on the idea of changing the company's vacation policy to reduce costs (Davenport, 2012; Davenport & Manville, 2012; Hollis, 2008). Through the metavoicing process, which included votes and commenting on this key idea, an alternative policy option surfaced

of a temporary salary cut across the board. This alternative policy, developed through a continuous communal online conversation, was ultimately successfully implemented, enabling the company to grapple with an economic downturn without lowered morale and productivity.

The theoretical mechanisms through which metavoicing helps an online knowledge conversation to be productive (i.e., in which quality knowledge sharing occurs) can be understood through the application of critical mass theory (Marwell & Oliver, 1993; Oliver & Marwell, 2001; Oliver, Marwell, & Teixeira, 1985). According to critical mass theory, when a sufficient number of people (a critical mass) attend to a common event, this attention will drive more people to the common event in a bandwagon effect. This ability to have large numbers of individuals rapidly provide feedback and attention on content enables participants to identify and highlight strengths, weaknesses, and/or perceived value of the original content (Fulk and Yuan, ; Kane, Majchrzak, Johnson, & Chen, 2009). Subsequently, a knowledge worker can more easily identify which coworkers are most respected by reviewing the comments made by others. Employees can then rely upon the identified respected individual in the future, further catalyzing knowledge sharing. Additionally, these comments can facilitate knowledge sharing when their aggregation identifies trends. For instance, by indicating which topics are most frequently discussed today compared to previous days, this information can be used to help steer individuals within the firm to contribute knowledge related to certain topics over others and push innovation along distinctive paths as a result. Therefore, individuals can productively engage in an ongoing knowledge conversation using metavoicing.

While the theoretical mechanism of critical mass suggests that an individual can help to make a knowledge conversation productive through metavoicing, other mechanisms may be activated that can inhibit the productivity of the knowledge conversation. One such mechanism that may be activated is “groupthink” (Janis, 1972) where crowds “do not seem to be particularly wise” (Sunstein, 2006, p. 130). That is, if most of the votes are in one particular direction, future readers often mistakenly assume that the vote tallies reflect a representative sample (Van Alstyne & Brynjolfsson, 2005). This leads to biased views of the accuracy of the comments. The participants actually represent a small subset of the more general population, which can dampen diversity and engagement as individuals who might challenge others choose not to metavoice (Preece & Schneiderman, 2009). Moreover, the ease with which votes are made allows individuals to influence others simply by being part of a count without giving much thought to the issue itself and without being engaged in a dialogue that might surface incorrect assumptions (Dixon & McNamara, 2008). For example, Kaiser Permanente has found that, when they offer customers the opportunity to engage in a knowledge conversation with the company, the assumptions about medical incidents occurring at Kaiser are often false, and need to be quickly corrected before the assumption becomes considered by others as fact (Eytan, Benabio, Golla, Parikh, & Stein, 2011).

In summary, then, the affordance of metavoicing provides one way in which knowledge workers can engage in the communal online knowledge conversation of the workplace. Metavoicing can foster productive knowledge conversations when the mechanism of critical mass is invoked. Simultaneously, though, metavoicing can inhibit the productivity of these knowledge conversations when they promote biased and inaccurate information.

Triggered Attending

A second affordance that affects how knowledge workers may engage in the ongoing knowledge conversation of the workplace is *triggered attending*. Triggered attending is engaging in the online knowledge conversation by *remaining uninvolved in content production or the conversation until a timely*

automated alert informs the individual of a change to the specific content of interest. With online forums in the past, knowledge workers needed to personally monitor the evolving content of the forum to know when a topic of interest was being discussed so they could then enter the conversation to share their knowledge. With social media, users can set automated alerts to do the monitoring of the content for the knowledge worker, notifying the worker when any change or specific changes are made in the ongoing conversation (Kane et al., 2009). For example, employees can set these alerts in online organizational social networks to be notified when the profile of someone they are following changes, indicating possibly the start of a new conversation about the individual's new job responsibilities or interests. They can set alerts on internal corporate wiki pages so that employees are notified when a wiki page they are monitoring is updated, or set alerts on internal microblogs (e.g., Twitter) or blogs and integrated chat systems (e.g., Chatter) to be notified when specific topics are discussed. These alerts allow the knowledge worker to remain essentially "unengaged" with the conversation until that point at which the worker may want to become engaged and express an opinion.

With triggered attending, knowledge workers can manage their notifications in a myriad of ways. They may set their alerts to be notified each time a change is made or aggregate the changes to be notified at the end of a time period. They may establish priorities associated with their alerts, indicating they may want to be informed with a text message the minute a particular type of change is made, while other changes can be sent to a list that they peruse as time permits. For instance, on many Enterprise 2.0 platforms implemented in organizations, users may choose to be alerted by grouped changes, such as by type of contribution (e.g., major or minor), by type of contributor (e.g., anonymous or not), or by type of agent (e.g., human or automated bot). Individuals attend to the knowledge conversation not based on personally monitoring and engaging in the conversation, but rather on the basis of preset events across a range of conversations in which they might be interested.

An example of the use of alerts to trigger the attention of knowledge workers is described in an interview with a social media analyst employed by the restaurant chain, P.F. Chang's China Bistro.¹ She describes a situation where a customer walked into a restaurant 3,000 miles away from where she was located. This customer registered her presence with a tweet. A software bot alerted the company's social media analyst on the east coast of the tweet. The analyst located on Facebook and Twitter a picture of the person who sent the tweet, called the manager of the restaurant, described the customer, and authorized a free lunch paid for by corporate headquarters. In addition to the obvious publicity garnered from this surprise lunch, this action informed customers that the restaurant chain cares about its followers and engages them on social media, encouraging followers to continue engaging in the conversation with the company.

One theoretical mechanism that may be activated in order for this affordance of triggered attending to lead to productive online knowledge conversations may be explained by expectancy theory (Porter & Lawler, 1968). In accordance with expectancy theory, when a knowledge worker is able to focus her energy only on those parts of those conversations in which she is interested, the worker should be sufficiently motivated to expend effort in the conversation to collaboratively cocreate with others. Attracting and retaining engaged users is often a challenge for online communities (Ma & Agarwal, 2007), and triggered attending may lower the effort required to remain engaged. Moreover, by off-loading monitoring activities to a computer and allowing the knowledge worker to engage in the conversation with little cost, the effort expended to engage is reduced and motivation is easier to sustain.

While triggered attending may afford productive online knowledge conversations by decreasing the effort required to engage, triggered attending may have negative effects on conversations as well. Triggered attending may fail to activate important mechanisms that are associated with productive knowledge sharing. For example, limiting dialogue only to predefined events reduces the possibility of

serendipitous knowledge sharing, which is considered an important element in innovation (Leonard-Barton, 1995). If people only exploit the existing knowledge that they currently possess as the basis for engagement, it may reduce the opportunity to explore for new knowledge and forms of engagement (Kane & Alavi, 2007; March 1991). Basing conversation and socialization on interruptions and predefined triggers may also lead individuals to engage in knowledge sharing activities with little contextualized knowledge (Te'eni, 2001). Individuals using pre-defined triggers may have little knowledge of what has transpired before, little socialization into the communication norms of the community, and little productive dialogue (Hinds & Mortensen, 2005) and thus have difficulty understanding others' perspectives when sharing knowledge (Te'eni, 2001). Alerts may be set by anyone including crowdsto swarm an organization's website to overwhelm and disrupt the website (Kane et al., 2009; Wagner & Majchrzak, 2006). If individuals in power use alerts for scrutinizing employee behavior, the alerts may activate perceptions of distrust, privacy invasion, and micromanagement, causing knowledge workers to withdraw from the conversation, and be more cautious when they decide to share (Menon & Phillips, 2011).

In sum, the affordance of triggered attending provides a second way in which knowledge workers can engage in the communal online knowledge conversation in the workplace. Triggered attending can foster productive knowledge conversations by motivating more people to engage because of the minimal effort involved. Simultaneously, though, triggered attending can inhibit the productivity of these knowledge conversations when serendipity, contextualization, and trust are harmed.

Network-Informed Associating

A third affordance that affects how knowledge workers may engage in the ongoing online knowledge conversation of the workplace is through *network-informed associating*. We define network-informed associating as engaging in the online knowledge conversation *informed by relational and content ties*. With previous technologies, such as e-mail, users were able to see the connections they were personally involved in but not the connections of others. In contrast, social media provide the capability to see how people are connected to other people, how other people are connected to content, and how content is connected to other content (Kane et al., forthcoming; Treem & Leonardi, 2012).

The technology provides the capability to use these connections to make new connections easily (e.g., "I am connected to X, so therefore I want to connect to you"). For example, a knowledge worker at the organization can join a project team's conversation more quickly by examining the associations among the tags that have been assigned to documents in the project or identify members of subnetworks to join by examining the associations among individuals based on past jointly authored papers. Network-informed associating allows the easy viewing of networks of connections that others possess and then using those views to decide where structural holes might exist, where an individual's special expertise may fit, and where bridging ties may be productively developed (Burt, 1992; Fulk & Yuan, 2013).

An example of the use of network-informed associating is IBM's social media "Facebook-like" platform referred to as IBM Connections (formerly Beehive & SocialBlue) that is used by IBM employees to discover new ties (DiMicco et al., 2008). IBM Connections allows professionals within IBM (or other organizations that deploy it) to view the social network graph of fellow professionals based on document authorship, connections, project membership, and/or membership in various communities of practice (Ransbotham, Kane, & Lurie, 2012; Majchrzak, Cherbakov & Ives, 2009). Employees view these network graphs to see which fellow professionals they might want to connect with based on who will provide them connections to other individuals, groups, or practice areas. While some of the new

connections made in this way are done exclusively for reputation (e.g., “connecting to this individual gives me only two degrees of separation from the CEO”), many are done in order to broaden one’s opportunities to begin knowledge conversations with others in the company (Kane et al., ; Majchrzak, et al., 2009).

One theoretical mechanism that may be activated to explain why network-informed associating positively affects productive knowledge conversations is social capital. Network-informed associating may engender increased social capital, which in turn helps to create opportunities to combine and exchange knowledge (Fulk & Yuan, ; (Nahapiet & Ghoshal, 1998). By linking to others and to content not previously part of that individual’s network, network-informed associating can generate a larger number of weak ties, a network feature associated with increased social capital (Hansen 1999). Additionally, the use of strong ties with network-informed associating can allow the knowledge worker to easily contextualize the knowledge being shared, further fostering one’s social capital (Tsoukas, 2009). For example, the increased visibility of the multiple networks possessed by an organizational actor—professional, friendship, or hobby-based, to name only a few—can render every employee a boundary spanner who is able to contextualize knowledge across different networks depending on which networks need to be tied (Levina & Vaast, 2005)). As another example, network graphs of the links of one blog to other blogs, as provided by IBM Connections, allow knowledge workers to examine the links to and from a blog to determine the centrality of the blog in a network of innovators before deciding to contribute.

Network-informed associating may also activate theoretical mechanisms that have unintended negative consequences for the productive knowledge conversation. Preferential attachment is one such mechanism that may get activated with negative consequences (Barabasi, 2003; Faraj & Johnson, 2011). Typified by the adage “the rich get richer,” preferential attachment in online communities states that people connect with particular individuals primarily because others have already connected with them. Thus, individuals may only attach to those they know or only connect with popular managers, professionals, or content sources, limiting their learning and knowledge exposure (Kane and Alavi, 2007). People, then, are not connecting with others necessarily because they value their insight or information but simply because they are popular. Preferential attachment may then discourage new ideas or creative solutions, akin to the “blind leading the blind,” precisely because individuals are only connecting with the most popular players in the knowledge conversation (Perry-Smith & Shalley 2003).

In sum, the affordance of network-based associating provides a third way in which knowledge workers can engage in the ongoing online knowledge conversation in the workplace. Network-based associating can foster productive knowledge conversations as knowledge workers strive to expand their social capital in pursuit of intellectual capital. Simultaneously, though, network-based associating can inhibit the productivity of these knowledge conversations as preferential attachment is activated.

Generative Role-Taking

A final affordance that affects how knowledge workers may engage in the ongoing knowledge conversation of the workplace is through *generative role-taking*. Generative role-taking is engaging in the online knowledge conversation by *enacting patterned actions and taking on community-sustaining roles in order to maintain a productive dialogue among participants*. Faraj, et al., (2011) have used the term generative role-taking to describe actions that are not prescribed but instead are emergently taken by any individual for the sole purpose of facilitating the dialogue. Social media enable generative role-taking because the visibility of the dialogue makes the needs of the conversation more salient. Participants argue, complain, and share frustrations publicly in these conversations (Treem and Leonardi, 2012).

Since the conversations are intended as peer-to-peer rather than a centralized spoke in the wheel through a leader, the manner in which these complaints, frustrations, and arguments get resolved is no one particular individual's responsibility. Consequently, unless participants are willing to step in to temporarily play a role needed by the participants, the conversation will be stalled. Examples of generative role-taking are seen when individuals voluntarily step into a divisive dialogue and offer a solution, as a participant did when he created "forked wikipages" to subdivide conflicting parties attempting to prepare a tutorial (Wagner & Majchrzak, 2006). Researchers have observed that users of corporate wiki pages step in to voluntarily organize the page for easier readability, reusability, search, and organization (Majchrzak, et al,). Researchers have also observed individuals in online knowledge conversations stepping in to champion someone else's ideas (Kane et al, 2009).

An example of this affordance used in the workplace can be found at VistaPrint, a \$400 million multinational specialty printing company that uses custom-developed code to manage a variety of their highly specialized equipment and processes (McAfee, 2009). The management wanted to increase efficiency of its core processes by improving the software programs that "ran" these procedures, but feared that opening up the code to the geographically dispersed engineers might break the code and harm the company's manufacturing process. The company decided to use social media to encourage a continuous conversation about the code among engineers so that engineers could test and continue to improve the code as it was changed. "Any of our engineers can check out and check in an updated and hopefully improved version . . . you ensure high code quality NOT by locking it down . . . but instead by giving lots of people the opportunity to improve things . . . letting lots of people contribute with few up-front rules" (McAfee, 2009, p. 94). In other words rather than formally assigning team leaders to write better code, VistaPrint effectively exploited the generative role-taking affordance to improve its code-base.

Not only are the roles and those who fulfill the roles not predefined, but other aspects of the knowledge-sharing community become emergent as well with social media, resulting in a highly generative process. Role-taking steps can evolve into routines and emerge in an online social media environment, initially unplanned when the community was originally conceived (O'Mahony & Ferraro, 2007). The flexibility of the social media technologies make it easy to add new functionalities to social media technologies through flexible technology settings, third-party apps, or automated bots which allow individuals to quickly introduce and automatically enforce new routines (such as introducing a bot that searches for swear words to enforce norms prohibiting their use) (Kane et al., ; Ransbotham & Kane, 2011). Persistence provides a community with a "narrative" for revisiting past identities and decisions, while informing future identities and decisions (Boland & Tenkasi, 1995). With this persistently evolving narrative, social media affords the community the freedom to experiment with different ways of organizing, because there is an artifact helping to guide them back if necessary.

Certainly not all generative role-taking fosters productive knowledge conversations. In online communities, the fluidity of participants can create a situation in which there is a loss of organizational memory (Ransbotham & Kane 2011; Stein & Zwass, 1995). As the knowledge conversation continues adapts to the latest participants, organizational memory can be lost even in the presence of persistent digital records because the latest decisions may be strewn across the different social media used and may not be well-organized in a repository for easy retrieval (Majchrzak, et al,). This memory loss can lead to the repeated revisiting of issues previously raised and resolved (Kane, 2011). Moreover, as participants come and go, social norms may need to be continuously adapted (Butler et al, 2007; Ransbotham & Kane, 2011), which may result in stubborn disputes with the only recourse for the individual to leave the community, creating further turnover that constrains the process of knowledge sharing.

In sum, the affordance of generative role-taking provides a fourth way in which knowledge workers can engage in the ongoing online knowledge conversation in the workplace. Generative role-taking can

foster productive knowledge conversations through reflectively reframing the conversation to remove temporary barriers that have emerged in the conversation. Simultaneously, though, generative role-taking can inhibit the productivity of these knowledge conversations when organizational memory is lost.

Discussion

In this paper, we explored four affordances of social media-leveraged engagement in the knowledge conversation. From this exploration, we found that these affordances appear to have a contradictory effect on productive knowledge conversations, simultaneously hindering and helping. Possibly due to the sudden ubiquity of social media, most evaluations of social media have focused on identifying dimensions of use (e.g., Kaplan & Haenlein, 2010), their liberating potential for joint creativity (Shirky, 2008) and their potential for sustaining social ties (Ellison, Steinfield & Lampe, 2011). They have only recently been analyzed from the perspective of impact on organizations (Kane et al., ; Treem & Leonardi, 2012). In this paper, we have offered an affordance lens to explore the interplay between social media technologies and people in the context of how knowledge workers become engaged in communal knowledge conversations. Although our focus has been on the adoption of social media in the workplace, we believe our theorizing would also be applicable to instances of social media use for knowledge sharing outside of as well as across organizational boundaries.

Our contribution is twofold. First, we adapt the affordance lens to reach the traditional separation between subject-object, user-artifact, intention-use dichotomies to focus on the intertwining of people and specific technology in-use. We explore four affordances where the people-technology relational symbiosis is most useful to understand changes to engagement in knowledge conversations brought about by social media: metavoicing, triggered attending, network-informed associating, and generative role-taking. Second, in contrast to the protechnology discourse that often assumes only positive impacts for information and communication technologies, we identify contradictory tensions that characterize the leveraging of these tools.

Our use of an affordance lens to study the interplay between human action and technological possibilities raises a number of theoretical questions regarding the definition and theoretical coverage of the concept. Indeed, the definition of affordances has evolved markedly since Gibson's (1979) original coinage of what an environment offers an animal in terms of shelter, food, or locomotion. The concept of affordance has had many uses over the years, forming the basis of an approach for artifact design that is obvious and inviting (e.g., Norman, 2007). The term has also been used as a way to explore use possibilities afforded by the design of a new technology (Markus & Silver, 2008) as well as ways to refer to interactions of features and organizational context to produce generic affordances (e.g., Treem & Leonardi, 2012; Zammuto et al., 2007).

Our analysis builds on the framing of Earl and Kimport (2011) to suggest that the explanatory power of an affordance lens can only be actualized if two conditions are met. First, the technology in question needs to be clearly identified and specified. Second, the domain of action needs to be limited to a specific set of activities. For instance, if the same social media technologies studied here were analyzed with a focus on online socialization, the final affordances are likely to be very different than what was identified here for online knowledge sharing. Where to draw the technical and social boundaries when studying affordances remains an open research question that is likely to be generative and dependent on the goals of the studies. The important but counterintuitive aspect of using an affordance lens is that these affordances generated by the artifact-actor relationship are specific to that relationality and thus move researchers away from the traditional certainties of separable technology attributes and actor's attitudes.

For each of the four affordances, we have described a number of tensions that point to the paradox of social media in-use: coexistence of opposite tendencies, unexpected consequences, and contradictory

findings. These tensions are not necessarily negative but can be theoretically generative in allowing researchers to explore underlying mechanisms, interconnections, and evolutionary processes (see Cameron, 2008; Farjoun, 2010; Lewis, 2000). Given the tensions generated by the positive and negative aspects of social media affordances, a starting point to understand engagement in the knowledge conversation is to look at forms of engagement, extent of engagement, and boundary issues. An important goal of our analysis of social media affordances was to shed light on the core organizational problem of how to get people to engage in effective knowledge exchange. Given the increasing prevalence of virtual organizing and online community participation (Faraj, et al., 2011), individuals are now increasingly in charge of the knowledge flow which previously had been the domain of organizational routines, information systems, and centralized management.

Each of our four affordances identifies ways in which individuals can exert control over the knowledge flow in a manner that contributes to the productivity of those conversations. When metavoicing, our examination suggests that individuals who spend time being informed of the issues and thus metavoice from a position of knowledge rather than pure reaction are more likely to move the conversation forward productively. When attending to a conversation based purely on triggered alerts, our examination suggests that individuals may need to set triggers that defend a conversation from others with triggers for disrupting a conversation. When associating based on network links, our examination suggests that individuals may need to purposely associate with content and other parties with few links in order to preserve the diversity and serendipity that creates new ideas in these knowledge flows. Finally, when engaging in generative role-taking, efforts need to be taken to make organizational memory of the knowledge conversation explicit and easily discoverable so that emergent role-takers don't cause the community to reinvent decisions.

Implications and Future Research

When organizational members engage in the knowledge conversation, their online activities have implications in terms of professional reputation, connection strategies, build-up of social capital, and image management (Ellison, Steinfield & Lampe, 2011; Kane et al., ; Wasko & Faraj, 2005). As depicted by our affordances, individuals are able to populate influential roles and engage in highly visible exchanges. They may become opinion leaders and valued experts outside the scope of the home organization and in areas possibly orthogonal to the organization's focus. This outcome raises a multiplicity of questions. What are the attention costs and benefits of full engagement with the social media affordances? Are the individuals who are leveraging the new affordances doing so at the expense of time and resources possibly needed at work? Recent research has identified the attention-draining costs associated with simple communication technologies such as email (Barley, Meyerson & Grodal, 2011). More workplace research is needed to examine the attention impact of high levels of engagement with social media.

An open question, then, is how are individuals able to balance their time and attention at work. We know little about how individuals manage engagement in all these knowledge conversations given the leveraged possibilities now at hand. Are individuals active in online knowledge exchanges exploring too broadly? Are they active on too many forums, keeping tab on too many topics, or engaged in too many knowledge conversations? What is "too many"? What are the tradeoffs between engaging broadly as a form of knowledge exploration, compared to engaging narrowly given the need to generate solutions to be brought back in the organization? Too "narrow" a form of engagement will lead to suboptimal exploration and sampling of the existing knowledge flows; too "broad" an exploration may not be specific enough to bring back the appropriate knowledge for the work at hand (c.f. March 1991).

The four affordances indicate that the knowledge conversation will be difficult to bound to particular groups, functions, or organizations. Knowledge conversations afforded by social media are likely to take place outside organizational boundaries, creating concerns about local or proprietary knowledge migrating beyond firm boundaries. Given the highly social and communal values in online knowledge exchanges there may be differences in whether knowledge is an organizational resource to be institutionally protected and nurtured, or a public good owned and maintained by open, and participative communities of practice (Wasko & Faraj, 2000). At the most basic level, we believe that social media affordances challenge traditional conceptualizations of knowledge management as a prerogative of the organization, turning these conceptualizations into a process under the control of each individual. The importance of rethinking traditional views of organizational boundaries and how to manage them constructively for complex knowledge work has been recently recognized as a crucial area in need of investigation (Faraj, et al., 2011; von Krogh, 2012).

Our exploration of social media affordances has exposed significant limitations to existing social and organizational theories. For example, a review of the theoretical lenses useful to study the metavoicing affordance shows the relevance of theories of critical mass to explain the positive aspects of metavoicing and theories of groupthink to explain the negative effects of metavoicing. Having had to rely on fragments of theories to explain and develop each affordance shows how existing theories appear to be all partially relevant but surprisingly limited in terms of applicability. There is a need for theoretical mechanisms to explore aspects of attention, filtering, socializing, boundary crossing, and evolving (Kane et al.,). Given the importance of engagement in the knowledge conversation, we also suggest the need for new theories to better explicate individual and communal engagement. Much can be gained from a deeper understanding of mechanisms related to online knowledge sharing as most of the published research on online knowledge sharing has focused on participation motivations or describing forms of governance.

Finally, our recognition of the contradictory effect of technology affordances on online knowledge sharing is consistent with a stream of literature on the paradox of organizing, in which contradictory effects are perceived as opportunities to reexamine assumptions, explore underlying forces, and surfacing polarities (Cameron, 2008; Farjoun, 2010; Lewis, 2000; Poole & Van de Ven, 1989; Robey & Boudreau, 1999). For example, extant theories of complex knowledge collaboration often require joint sensemaking, negotiation of differences and bridging of worldviews, something that is assumed to be best done face to face and under conditions of shared history, pre-existing ties, joint engagement, negotiations across different perspectives, and careful surfacing of assumptions (c.f., Tsoukas, 2009). These requirements are seldom present in social media environments where feedback is immediate, assumptions are constantly challenged, the central entity to guide the conversation is replaced by highly networked individuals often occupying self-generated roles. Given these paradoxical tensions, new theories may need to take into account the lack of deep ties and the emergent nature of interactions.

Conclusion

This paper applies an affordance lens to explore the collaborative knowledge sharing made possible by the leveraging of social media. We identify and examine four affordances associated with social media that are generative for engaging in the knowledge conversation occurring increasingly outside an organization's boundary. We theorize that social media provides four affordances representing different ways to engage in knowledge sharing conversations: metavoicing, triggered attending, network-informed associating, and generative role-taking. These forms of engagement activate different theoretical mechanisms in affecting how people engage in the knowledge conversation. A review of the theoretical mechanisms

affected by each affordance further indicates that some mechanisms, when activated positively move the knowledge conversation forward, while others may have adverse unintended consequences for the organization.

By developing an affordance lens to explore social media, our paper offers several contributions. First, by shifting the discussion of workplace knowledge sharing from a focus on knowledge management systems to a focus on knowledge conversations, research on knowledge sharing becomes more aligned with the capabilities of technologies. Second, the affordance lens allows the integration of technology with individual actions, and thus providing a valuable lens that avoids the separation between user and technology artifact. Finally by identifying how different mechanisms are activated in the context of different affordances, and that, even for the same affordance, different mechanisms with contradictory effects can be activated, we offer a specific way forward in theorizing about the nexus of how social media is leveraged in knowledge sharing.

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Note

1 http://www.youtube.com/watch?v=Zpweflyo_54

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