Article

When Wiki Technology Meets Corporate Knowledge Management Routines: A Sociomateriality Perspective

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Abstract: There seems to be an inherent tension between wiki affordances—open boundaries, unconstrained editing, and transparency—and traditional knowledge management (KM) routines used in firms. The objective of this study is to investigate how users respond to these tensions during adoption of wiki technology at the workplace. The theoretical lens of sociomateriality highlights the manner in which routines and materiality (namely, technology) relate to one another, providing a useful conceptualization for our investigation. In particular, we adopt Leonardi's theory of human and material imbrication, which stresses the importance of a worker's past experiences with technology in determining his future adoption decisions. Extending Leonardi's conceptualization, we suggest that *out-of-work experiences* are also influential. Namely, we argue that attitudes towards Wikipedia influence one's response to wiki deployment in the workplace. Using an online survey containing four open-ended questions, we assessed the perceptions of employees towards wiki deployment. Results from our qualitative analysis of 1032 responses reveal five approaches users take in responding to the tensions between wiki affordances and existing KM routines, highlighting the effect of users' dispositions towards Wikipedia. Our findings inform the sociomateriality literature and shed light on the challenges faced by organizations trying to adopt social media tools.

1. Introduction

In the past, knowledge management systems (KMS) were specifically designed to allow firms to manage their knowledge resources, and employees practiced their use only within the organizational context. However, since the advent of the Internet and its various applications, a different trend has developed, whereby organizations began to adopt technologies which were first popularly used outside of the organization, in the open environment of the Internet. Thus, for example, social media tools, such as discussion forums, instant messaging, Weblogs, podcasts, and wikis, were adopted by organizations to support open knowledge management (KM) and enable the creation of knowledge through conversations [1–4]. In other words, in the more recent scenario, organizations are asking employees to tailor their use of technologies with which they are already familiar from a non-organizational context to meet the organization's KM needs.

Most past KM projects were initiated top-down and driven by management, creating a rigid centrally controlled KM structure that often exhibited poor incentives for sharing and reuse of knowledge [1,3,5–8]. In these traditional organizational IT-mediated work processes (and particularly systems that support collaboration around knowledge), work was structured in such a way that each team member was able to perform only the tasks for which he or she were responsible, such that there was a distinction between content creation, editing, curation, and administrative tasks. This division

of labour was primarily enabled through access control, such that each user has access to certain information resources based on one's role.

Inspired by the open-source software development [9] and later Wikipedia [10,11], this co-creation and peer-based production over the Internet offered an alternative model of KM that emphasized principles such as open access and community governance [12]. When used within organizational settings, wikis remove many of these workflow restrictions, such that any wiki writer is automatically an editor and organizer [1,8,13,14]. In addition, wikis track versions of the knowledge base, and this historical data is available to all participants [14]. Similar to other end-user computing applications, social media—especially when deployed in innovative and knowledge-intensive organizations—could be tailored to fit the particular organizational need. However, despite the fact that employees are already familiar with the wiki technology from a non-organizational context and it is relatively easy to use, the process of implementing the "wiki way" of knowledge co-creation is challenging since it entails changes in organizational routines. Thus, the adoption of wikis within the workplace has encountered substantial difficulties [15].

To date, most studies on the adoption of wikis in organizations have focused on the effects of intra-organizational factors (e.g., the role of intrinsic rewards such as respect, improved status and reputation [16]; role perceptions as a moderator of autonomous and controlled motivation [8] on the wiki adoption process. By contrast, the current study, acknowledging the importance of employees' prior experiences with this technology, seeks to explore the impact of factors external to the organization. Our study of the process of adopting wiki for KM purposes within an IT organization investigates users' responses to the inherent tension between wiki affordances and traditional KM practices. We focus our attention on one specific wiki application: the development of an encyclopedia of organizational knowledge [8,17,18]. Using the theoretical lens of sociomateriality enabled us to focus on these tensions, examining the manner in which organizational KM routines and the new wiki technology relate to one another. We performed an inductive qualitative analysis of employees' perceptions regarding wiki adoption. The results of our analysis demonstrate the great variability in users' attitudes towards the deployment of the wiki-based organizational encyclopedia. Revealing that the source of this divergence lies in dispositions towards Wikipedia, we offer a more nuanced understanding of Leonardi's [19] imbrication theory, by suggesting that out-of-work experiences with technology can also impact one's decision of whether to align one's work routines with the newly-introduced technology or alternatively to change technology's functionality.

This paper proceeds as follows. In the next section, we turn our attention to the theory of sociomateriality, in an effort to better understand the tensions that accompany wiki adoption in the workplace; we continue with a description of our research methodology and details of our results; finally, we discuss the implications of our findings to theory and practice and conclude the paper by pointing to future research directions.

1.1. Theoretical Perspective

1.1.1. The Material and Social Dimensions of Technology

Technology affords certain uses. For our purposes, a technology affordance is defined as the mutuality of actor intentions and technology capabilities that provide the potential for a particular action [20,21]. This perspective views human interaction with technology as relational, where neither actor nor technology are dominant. That is, while technology does not define what is possible for the actor to do, the human actor is not free from the limitations of the technological environment. Instead, possibilities for action emerge from the reciprocal interaction between actor and artifact [22,23]. An affordance perspective builds on the possibility of new ways of working and organizing that were not intended by the designers and are often difficult to predict a priori; nonetheless, it also recognizes that certain uses are facilitated or hindered by the qualities inscribed in the current technological artifact. Thus, in line with the user-centric perspectives, technological tools could be viewed as bundles

of features, where users select a set of functionalities to support their work [24,25]. It is important to stress that when considering end-user computing, actor's choices extend beyond the selection of features; that is, human actors are able to change the technology and tailor it to their needs by introducing new features or changing existing ones.

Technology is interested in the development of tools, and thus a technological artifact clearly has a material dimension. The term *materiality* refers to "the arrangement of an artifact's physical and/or digital materials into particular forms that endure across differences in place and time and are important to users" [26] (p. 42). The functions and symbols designed into technological artifact, as well as the ways in which its physical or digital materials are arranged into particular form, represent the material dimension of technology. These arrangements are stable across time and settings, and make certain actions possible and others impossible.

Technology also has a social aspect that reflects the practices and routines associated with technology usage. As explained above, a technology artifact affords ways of interaction: as users appropriate particular uses, they embed the artifact into organizational practices and routines. The extent to which the material and social aspects of technology are coupled is an area of ongoing debate in the scholarly literature. Orlikowski [27] and Orilowski and Scott [28] introduced the concept of sociomateriality to denote the lack of separation between the social and the material aspects of technology; Leonardi [26] defined it as the "enactment of a particular set of activities that blend materiality with institutions, norms, discourses, and all other phenomena, typically defined as social" (p. 42).

Moreover, Leonardi [19] argues that although the material and social dimensions of technology are tightly coupled, they are not coalesced. He developed the notion of "imbrication" to describe the way in which the human and material agencies associated with a technology are interwoven, where to imbricate means to arrange distinct elements in overlapping patterns so that they function interdependently (as in setting tiles with an overlapping of edges) [29,30]. According to Leonardi [26], a *sociomaterial practice* is the space in which human (or social) and material agencies are imbricated by users during a technological change.

1.1.2. The Adoption of New Technology and Organizational Change

When discussing technological change, Orlikowski [31] stresses users' ability to work around technology's material agency. While scholars recognize that the way users choose to interact with the technology is largely determined in response to the technology's affordances [32], people "can choose to do otherwise with the technology at hand within existing conditions and materials" [31] (p. 412), such that their work is not determined by the technology they employ. During technological changes, people must cope with the material agency of the new technology (which is often out of their control), finding ways to appropriate the technology in the pursuit of their goals. According to this line of reasoning, when people struggle to cope with the change brought on by technology they either maneuver around it (i.e., using features in ways not intended by the designers), change their work routines to align with technology's agency, or decide not to adopt the technology, but in all accounts, technology's features are left intact [31].

An alternative perspective suggests another possible course of action: changing the technology artifact in order to better integrate end users into the computing environment [33]. End-user computing refers to information systems in which non-programmers can create or modify working applications. Such an environment is more pervasive in high-tech and knowledge-intensive contexts, where many of the employees possess the technical savvy required to modify applications. Today more than ever before, employees have many alternative ways for changing the design of technology and adapting it to their needs. Not only are people more computer literate and are aware of technology's flexibility, as organizations become more computerized, employees are more likely to have access to in-house developers who can help them modify the technology to their needs, since "human and material agencies are the shared building blocks of routine and technologies" ([19] p. 149).

Leonardi's [26] metaphor of imbrication emphasizes human agency in adapting technology. His theory was developed in the context of a software development firm, where employees were skillful in changing the information systems that supported work processes. What factors determine people's choice between changing their work routines or the technology artifact? Leonardi [19] explains that the decision is based on their perceptions of what a routine or a technology can (and cannot) do vis-à-vis their re-defined goals.

Depending on whether they perceive that a technology affords or constrains their goals, they make choices about how they will imbricate human and material agencies. Acting on the perceived affordances of a technology can then lead users to realize new intentions that could be achieved through these material features. The different ways in which human and material agencies are imbricated result in either a new routine, or a new technology [19] (p. 154).

When people perceive the technology as constraining, they typically seek to change a functionality in the technology, thus giving it a new material agency. As a human agency adopts the new material agency, it is also affected by it, hence imbrication. When the affordances of a new material agency are internalized, the resulting sequence of imbrications leads to changes in routine. In this is a cyclical process: new constraints will eventually emerge, leading to a new series of imbrications. Leonardi [19] notes that in this sense, each cycle interacts with the entire history of imbrications, i.e., the preceding series of imbrications. Thus, past imbrications accumulate to help explain how human and material agencies will become conjoined in the future and that people actively work, within the framework established by previous imbrication, to reconcile their goals (human agency) with the things that a technology can or cannot do (material agency) [19] (p. 152).

Taking these ideas to the context of the current study, it is expected that the effects of introducing wikis into the organization will be determined by users' perceptions of whether the wiki materiality affords or constrains their ability to perform their knowledge work. Accordingly, if the affordances are perceived as enabling, knowledge workers are likely to alter their daily practices and routines; if, on the other hand, the wiki's material agency is perceived as constraining, employees may choose to adjust the wiki technology (especially in settings where employees are capable in making such changes, e.g., in high-tech organization). Adopting Leonardi's notion about the role of the entire history of imbrication in each cycle of a new imbrication process suggests that an exploration of wiki adoption in an organizational setting should take into account employees' previous experience with and relevant history of wiki use. However, in the case of wiki technology, employees' experience of wiki use resides, at least in part, outside the organization. Thus extending Leonardi's ideas by expanding the context from where imbrication takes place.

1.1.3. External Factors Shaping Employee Perceptions of Technology's Affordances and Constraints

In this section we wish to discuss the potential external influence of Wikipedia—its underlying technology platform and community-based governance mechanisms—on employees' perceptions regarding the extent to which the organizational wiki affordances or constrains their work routines. As we explained above, Leonardi maintains that employees' past experiences with the particular technology in the work setting determines future imbrication choices. However, the use of Wikipedia technology, initially deployed over the Internet, precedes its adoption in the organizational setting. Recalling that organizations are "inseparable from the transactional contexts in which they are embedded" [34] (p. 287), we make the argument that employees' prior experiences with and perceptions of wiki technology (namely, Wikipedia) are likely to influence their perceptions of wiki technology's affordances and constraints in the workplace. Consequently, we propose that a sociomaterial should also consider employees' out-of-work experiences, particularly in the context of the current study where the technology at hand—wiki—has become popularized over the public Internet. Therefore, in the current study, we expect that wiki users' responses to the tensions between the material agency (wiki's perceived affordances and constraints) and human agency (existing KM routines) would be affected by past out-of-work experiences with Wikipedia.

Social media tools such as wikis first became popular in leisure-related settings (e.g., social networks, such as Facebook), and only later were they imported into the business environment, stressing the importance of people's non-work-related experiences with social media. In particular, when discussing the adoption of wikis within the workplace, we have to consider people's perceptions of the most popular wiki system: Wikipedia. Wikipedia, one of the most visited websites, has attained the status of a cultural icon. Moreover, Wikipedia's unique co-creation practices (open and egalitarian) have been the topic of heated public debates. Hence, large parts of Western society are not only consumers of Wikipedia content, but are also likely to have developed personal views of its content-creation practices. Whereas some tend to applaud Wikipedia's innovative approach for harnessing the "wisdom of the crowd", others find fault in its community-based quality assurance processes.

Some distinguished scholars and thought leaders have hailed Wikipedia's co-production process and discussed its novel governance procedures [12,35,36]. Empirical accounts provide support for these claims, demonstrating that the content on Wikipedia articles is generally of high quality [37]. Nonetheless, Wikipedia is not considered a legitimate source in the traditional, legal–rational sense. Gelernter [38] refers to Wikipedia as having *practical legitimacy*: on the one hand it is a manifestation of an encyclopedia, which was a legitimate (rational-legal) resource in the past, while on the other hand, it includes pages of discussions and warnings, indicating that it is an incomplete structure. Hence, its legitimacy is constrained, and each entry must be judged separately and contextually. Findings from Gelernter's [38] interviews with 20 journalists indicate that they use Wikipedia in a paradoxical way: " . . . although they [journalists] use Wikipedia routinely, they construct it as an unreliable source, and erase all evidence of having used it from their texts . . . divulging its use to readers conflicted with their sense of duty..." (p. 232). In education, although it is widely recognized that Wikipedia is one of the most popular resources used by students [39], there is an ongoing debate among university faculty surrounding the legitimacy of its use, with the majority in opposition to the use of Wikipedia as a course resource, raising concerns around Wikipedia's authority, accuracy, and reliability [40,41]. Recently, Jemielniak and Aibar [42] conducted a literature review on perspectives towards Wikipedia in academia, and revealed that most faculty members feel that "Wikipedia is not well regarded by their colleagues as a respectable source of information" (p. 3), and concluded that there is an inherent tension between scientific culture and peer production.

With such strong opinions in favor and against Wikipedia, our conjecture in this study is that employees' imbrication decisions regarding the use of organizational wikis are shaped—at least in part—by the contention surrounding their out-of-work experiences with Wikipedia. That is, we extend Leonardi's ideas, by expanding the context where imbrication takes place. With these concepts in mind, we studied the responses of knowledge workers at a single high-tech organization to the introduction of a wiki-based organizational encyclopedia. Using a number of open-ended questions, we attempted to identify prototypical standpoints that differ in terms of their perceptions of the tensions between wiki's open affordances and KM routines. Our analysis pays particular attention to worker's attitudes towards Wikipedia. Details of our research methodology and results are provided in the sections that follow.

2. Materials and Methods

The methodology used in the current study involved content analysis of 1032 comments to four open-ended questions which were part of a survey conducted online among users of a wiki-based encyclopedia in a large multi-national firm with over 350,000 employees. The firm designs hardware, develops software, and provides professional computer services. This was a particularly appropriate research population, due to the very large—and constantly growing—population of wiki users. The firm's tradition of end-user computing meant that skilled employees were accustomed to tailoring applications to their needs. The wiki-based encyclopedia was launched in March 2008 as an internal repository of corporate knowledge and provides a space for unrestricted, world-wide collaboration

between employees [8]. At the time of the study, there were approximately 750 unique contributors to the online encyclopedia; contribution activity was at about 1300 edits per month; and the wiki was accessed roughly 330,000 times per month. An announcement regarding the survey appeared on the encyclopedia's homepage, visible to all active users; however, the exact number of people who read the announcement is unknown. One thousand wiki users participated in the survey, and after removing records with incomplete data there remained 992 respondents.

Given that by design, close-ended survey questions limit the scope of what respondents can include in their answers [43], the online survey included also four open-ended questions, intended to explore the nuances of users' experience with the wiki-based organizational encyclopedia. The questions were: Q1: "Have you contributed to the organizational encyclopedia by editing any article? [Yes; No] (If 'No', please provide the reason)"; Q2: "What is your main motivation for contributing to the organizational encyclopedia? What do you think the organizational encyclopedia should become? Please share your thoughts"; Q3: "Please describe all of the benefits you get from the organizational encyclopedia", and Q4: "What changes would you like to see in the organizational encyclopedia and why do you think they would help?" We received 229, 234, 330, and 239 comments for Q1, Q2, Q3, and Q4, respectively, totaling 1032 comments. We analyzed the comments' contents with the Atlas.ti 5.2 toolkit (http://www.atlasti.com), using the inductive approach of qualitative content analysis, assuming no a-priori knowledge regarding the particular constructs under investigation [44]. We read and interpreted all responses repeatedly. After discussing the meaning of responses, key words and phrases were marked for each comment separately, analyzed for similarities and differences, and then a coding scheme was developed. Next, sentences were re-read according to the new scheme, concepts were identified (arriving at 5, 4, 4, 5 concepts for Q1, Q2, Q3, Q4, respectively), and each comment was associated with relevant concepts. Comments that could not be classified into any of the identified categories were grouped under "other".

3. Results

In the process of repeatedly reviewing and coding the authentic and voluntarily provided written responses, we found a spectrum of attitudes criticizing and/or praising wiki technology and the KM routines that it entails. Findings represent the "voice of the respondents". A great deal of variation was found between and within user classes related to the choices they make about how they imbricate human (KM routine) and material (wiki features) agencies. The variation reflected genuine expressions of what Orlikowski and Scott [28] coined [diverse] "sociomaterial ensembles": the manifestation of users' decisions whether to adopt the wiki technology based on their perceptions of what the wiki technology can (and cannot) do, vis-à-vis their re-defined goals. In Table 1, in order to portray the different patterns that exist between the various user classes, we use the term "action" to describe the micro-level dynamic of users' behaviors in response to the adoption of the wiki technology and characterize the various patterns identified.

The analysis revealed five different types of users representing different perceptions regarding the wiki technology and the adoption of KM routines. Users expressed various dispositions towards Wikipedia, which in turn influenced their perceptions regarding wiki adoption. Of these user classes, three were prepared to adopt the wiki technology. However, they differed in their reactions to the "human agency" (changes in routines) and "material agency" (altering the technology). *The Criticizers* objected to the change in routines entailed by the adoption of wiki technology; instead they preferred to use the wiki within the traditional centralized and hierarchical organizational framework. In contrast, *The Enthusiasts* were happy to change their work routines and apply a more open KM process that resembles Wikipedia's collaborative authoring. The most flexible approach in terms of both human and material agencies was expressed by *The Visionary Negotiator* class, whose members were willing to both change KM routines and customize the wiki technology to fit their needs. The remaining two classes of users rejected the adoption of the wiki technology in different ways: while the *Hesitant* class was characterized by the expression of confusion regarding the goals and the legitimacy of the

organizational wiki, especially when compared with Wikipedia, the members of the *Outsider* class were agnostic about changes to routines and to the wiki technology. Table 1 below describes the different user classes according to their perceptions regarding the wiki technology and the KM routines, and the action they take in the adoption process, as implied in their responses. Table 2, which follows Table 1, provides sample quotes for each of the user classes.

Table 1. Perceptions about technology and routines.

User Class	Perceptions about Technology & Routines	Action
The Outsider	Not yet motivated to act. Has no perception of wikis' constraints nor affordances.	Ignores new technology and/or continues to use existing technologies and routines. Demonstrates an inertial approach.
The Hesitant	Not sure about the use of newly-introduced wiki technology and routines.	"Sits on the fence"
The Criticizer	Perceives the technology as constraining the ability to achieve his goals.	Preserves existing routines, overlooking the opportunities afforded by new technology.
The Enthusiast	Perceives changes in technology and routines as acceptable. Constructs positive perceptions of wiki affordances. Creates a space of opportunity.	Acts to appropriate routines that fit the new technology.
The Visionary Negotiator	Perceives technology and routines as flexible (users can reinvent, redesign, and reconfigure their new material features to get the most out of wikis). Constructs perceptions of affordances and constraints. Creates a space of both opportunity and frustration.	Acts to change both technology and routines.

Table 2. Sample quotes for each user type.

User Class	Sample Quotes [in Brackets: the Source Open-Ended Question]
The Outsider	[Q1] "I'm a new employee, so I don't have much knowledge to share"; [Q1] "nothing to add so far"; [Q1] "I haven't encountered anything that needed to be changed"; [Q1] "nothing to add yet"; [Q1] "lacking content contribution materials"; [Q1] "Do not have anything worthy of contribution"; [Q1] "Have not found the right article to edit".
The Hesitant	[Q1] "Don't know the ground rules"; [Q1] "What is the difference between this and a wiki?"; [Q4] "At first, the aim should be to inform more and better about the wiki's aim and purposes.... I think that would clarify the purpose"; [Q2] "I think a clear strategy statement should be made"; [Q2] "Still trying to understand the purpose"; [Q1] "What is the difference between this organizational encyclopedia and a wiki?".
The Criticizer	[Q2] "The only concern I have is that we don't end up with something like Wikipedia, where the information is sometimes doubtful. Not sure exactly how to achieve this"; [Q4] "I'd like to see more focus on governance, lightweight review, management of old content and moving it to being more authoritative than other sources"; [Q2] "A 'sometimes' weakness of Wikipedia is the lack of SME (subject matter expert) editing; SME editing is important to the credibility of the organizational encyclopedia".
The Enthusiast	[Q4] "From what I have seen so far, it is pretty close to the Wikipedia model and that seems to work pretty darn well."; [Q2] "Well the organizational encyclopedia is the Wikipedia for our organization (internal usage)"; [Q2] "Part of the joy of a space like this is to see where it takes us... I don't have a clear vision of where it is going and to some degree I don't even want the developers of the organizational encyclopedia to control the vision and direction too strictly. I'm excited to see where contributors take this thing... what ideas they have what needs arise etc.".
The Visionary Negotiator	[Q4] [I would like to] "improve the indexing and ranking of the organizational encyclopedia's content, so that it can be found more easily"; [Q4] [I would like the wiki to include] "An easier index to access contents"; [Q4] [I would like the wiki to include] "A browsable hierarchical list"; [Q4] [I would like to be able to] "Add a ticker or something like that to let people know what information is available in the organizational encyclopedia"; [Q4] [I would like to] "get the search engine functioning . . . improve the layout"; [Q4] [I would like to] "Add a search box on every page, more search fields and options"; [Q4] [I would like the wiki to include] "A French interface/ version . . . Additional languages"; [Q4] [I would like the wiki to include] "Geography-based organizational encyclopedia".

4. Discussion

Wikis are being applied to a large number of knowledge management tasks, serving most of a firm's functional areas and used within groups of various sizes [1,3,4,7,18,45–48]. While wiki technology in itself is relatively easy to use, the process of implementing the "wiki way" of knowledge co-creation entails changes in organizational routines: knowledge creation is open to all, independent of expertise; workflow constraints are eliminated; new contributions instantly and automatically "go live"; and quality assurance is performed after-the-fact. Thus, it is not surprising that organizations face difficulties in wiki adoption. The present study explored employees' perceptions regarding the adoption of a wiki-based encyclopedia in a knowledge-intensive organization, where employees were able to make material changes to the technological tools in order to support their work, as well as to adapt work routines to align with technology's affordances. Based on Leonardi's [19] metaphor of imbrication, the availability of this choice is expected to enhance employees' ability to adopt flexible technologies: when the technology is perceived as affording new opportunities, workers are likely to adapt their routines, and when technology is viewed as restricting, employees can work to modify the tool's design.

Our results suggest that there is a great deal of divergence in the manner in which people interpret the potential impact of a technology, and we found that people differ greatly in the way in which they manage to maneuver around the wiki technology. Four of the five user classes identified herein perceived the wiki technology as an inflexible application that imposes change in organizational routines. Yet the emotive reactions of users in these classes to the imposed change in routines ranged from indifference to enthusiasm and from resistance to acceptance. Only the fifth class, the Visionary Negotiators, recognized that they could change the material makeup of the wiki technology just as easily as they could change existing routines. This class might be considered the true "champions of technological innovation" [49]. Without an understanding of technology's constraints and affordances, employees are likely to continue using existing technologies and applying routines in inertial ways, as was demonstrated by the Outsider and Hesitant classes.

As the findings of this study demonstrate, prior imbrications within the organizational framework, coupled with out-of-work exposure to and experience with the technology, lead to a diversity of responses to the tension encountered between technology's affordances and the KM routines. In line with the view that "interrelated sequences of actions performed by multiple actors . . . are comprised of micro-level relationships between specific actions and patterns of action" [50], we surmise that new routines are less likely to emerge at the macro-level when there is diversity in actors' micro-level responses.

These finding make a contribution to the literature by demonstrating employees' wide variety of attitudes towards wikis' deployment. Prior research on the diffusion of innovation makes the distinction between early and late adopters [51], such that at any particular point in time employees could be classified as either adopters or non-adopters. Studies on the acceptance of technology within the workplace had identified a series of factors affecting one's decision of whether to adopt an information system (e.g., perceived usefulness, ease of use) [52,53]. This study's results allow us to move beyond that quantitative interpretation of users' perceptions to a richer qualitative characterization of users' attitudes towards the technology being introduced.

The primary theoretical contribution of our study is related to the *source of employees' perceptions* regarding the relationship between a new technology and existing routines. Leonardi [19] explains that the perception of whether a technology constrains a desired action or affords a new one depends on prior imbrications (Leonardi, 2011). By "prior imbrications", Leonardi refers to employees' past experiences of adopting technology at the work place. Our key argument is that the scope of prior imbrications could be expanded to include out-of-work experiences. The adoption of a wiki-based encyclopedia within organizational settings provides an excellent opportunity for illustrating this point. Not only were wikis initially introduced publically over the Internet and only later converted to an organizational KM, Wikipedia, the most notable wiki application, has gained enormous success and,

hence, people's opinion of the technology's advantages and disadvantages was likely to have been formed earlier, outside of the workplace. The direct comparison that employees drew to Wikipedia ("Well, the organizational encyclopedia is the Wikipedia for our organization's internal usage"), coupled with Wikipedia's controversial knowledge-creation model, triggered strong reactions towards the deployment of the organizational encyclopedia. For example, users within the Criticizer class questioned the credibility of content on Wikipedia and expressed concerns that "we don't end up with something like Wikipedia, where the information is sometimes doubtful". Clearly this class of users perceived the technology as constraining, and sought ways to modify it (e.g., by including "more focus on governance, lightweight review, management of old content . . . "). In contrast, users identified as the Enthusiast class viewed wiki technology as affording new and better ways for managing knowledge, as stated by a user: "From what I have seen so far, it is pretty close to the Wikipedia model and that seems to work pretty darn well." Interestingly, we could *not* find evidence in employees' statements of the influence of prior workplace imbrications on their perceptions regarding the tension between wikis' affordances and KM routines. In sum, evidence from this study suggests a shift in our understanding of Leonardi's theory of imbrication [19], away from the influence of previous in-work imbrications and highlighting the effect of out-of-work experiences with a technology that is later to be deployed in the organization.

In addition to the theoretical implications, our study has important implications for practice. Industries are seeing the breakup of large traditional organizational structures and the emergence of new, networked organizational forms, where knowledge is believed to be a firm's most profitable resource. Hence, firms derive value primarily from intellectual, rather than physical, assets. Although open knowledge management systems, and in particular wikis, play an important role in helping people share their local expertise and enabling firms to integrate individual's contribution into an organizational knowledge asset, some people perceive content on wikis as lacking credibility. Based on our findings, practical recommendations for the management of wikis deployment in corporate environments would essentially include the following: (a) recognize the tension that exists between the "wiki way" and traditional KM routines; (b) acknowledge that the success of wikis' deployment is linked to employees' dispositions towards Wikipedia; (c) run training programs teaching employees how to modify wiki systems and adapt it to their needs; and (d) allocate resources to the management of workers' attitudes during the process of deploying social media applications in organizations. In particular, we propose that deployment begins with those who realize the potential of the "wiki way". Another recommendation for successful deployment of wiki systems is to concentrate efforts in communities of practice, where sharing knowledge is part of the routine. Changing organizational knowledge management routines to align with the open approaches practiced in open source software development and in Wikipedia (referred to as "Wikinomics" [54]) requires managerial support and the leadership of visionary executives.

Notwithstanding our contributions, any conclusions drawn from this study should be considered in light of several limitations. One concern is that other exogenous factors not captured in our analysis might have influenced the pattern of results. For example, prior experience with social media applications in organizational settings may have affected attitudes towards wikis' adoption. In future research, we plan to explore additional possible explanations for the relationship between perceptions of Wikipedia and responses to the deployment of wiki technology. Another possible limitation is the reliance on a qualitative research methodology. Although this methodology afforded us a more nuanced view of the factors that influence employees' reception of a new technology in the workplace, we propose that additional insights may be gleaned through a large-scale quantitative study of wiki adoption. Finally, we acknowledge that some features were unique to the specific organizational and technological setting we studied and, therefore, we should be cautious in generalizing our findings to other settings.

In conclusion, this research contributes to the study of IT-enabled knowledge management, as well as to the theory of sociomateriality. We observed that applying the theoretical perspective of

sociomateriality to the deployment of new technologies in the workplace should take into account the influence of out-of-work experiences on the decision whether to adapt routines to maximize a technology's affordances or to attempt to modify the tool's design. Examining the adoption of a technology that had previously made an impact in the public domain enabled us to illustrate how attitudes formed beyond the organizational setting later affect one's response to the deployment of the same technology at work. Hence, our results inform the theory of sociomateriality, presenting a more nuanced picture of prior imbrications. Our study provides only preliminary findings and future research is warranted in order to provide a more complete understanding of how past imbrications in and out of work interact to shape one's responses to the tension between organizational routines and wiki affordances.

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