Organization Science

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Abstract. When actors deem technological change undesirable, they may act symbolically by pretending to comply while avoiding real change. In our study of the introduction of an algorithmic technology in a sales organization, we found that such symbolic conformity led unintendedly to the full implementation of the suggested technological change. To explain this surprising outcome, we advance a regime-of-knowing lens that helps to analyze deep challenges happening *under the surface* during the process of technology introduction. A regime of knowing guides what is worth knowing, what actions matter to acquire this knowledge, and who has the authority to make decisions around those issues. We found that both the technologists who introduced the algorithmic technology, and the incumbent workers whose work was affected by the change, used symbolic actions to either defend the established regime of knowing or to advocate a radical change. Although the incumbent workers enacted symbolic conformity by pretending to comply with suggested changes, the technologists performed symbolic advocacy by presenting a positive side of the technological change. Ironically, because the symbolic conformity enabled and was reinforced by symbolic advocacy, reinforcing cycles of symbolic actions yielded a radical change in the sales' regime of knowing: from one focused on a deep understanding of customers via personal contact and strong relationships, to one based on model predictions from the processing of large datasets. We discuss the theoretical implications of these findings for the introduction of technology at work and for knowing in the workplace.

Introduction

The process of introducing a new technology in the workplace creates new possibilities for ways of working and organizing. Yet, the introduction of a new technology becomes problematic if it threatens workers' practices, for instance, by substituting existing ways of knowing with novel ones or replacing and devaluing the skills of incumbent workers (Noble 1984, Zuboff 1988, Barrett et al. 2012, Bailey and Leonardi 2015). In such cases, workers are likely to question the superiority of the ways of working associated with the new technology and resist its implementation (Markus 1983, Bailey and Barley 2011, Anthony 2018). Instead of outright resistance, sometimes workers use covert ways of resisting the implementation and adopt the new technology symbolically, by pretending or suggesting that they use it without actually doing so (Hewlin 2003, Berente and Yoo 2012).

Although the literature treats symbolic conformity as a tactic that workers may use to avoid real change (Oliver 1991, Hallett 2010), we observed that symbolic conformity can lead, unintendedly, to the full implementation of the suggested technological change. In our study of the introduction of an algorithmic technology in the sales department of a telecommunications organization, account managers avoided using the introduced technology because it was associated with ways of knowing that were orthogonal to how they constructed and used knowledge. They resorted to symbolic conformity by pretending to use the technology for identifying sales opportunities. However, their symbolic conformity significantly contributed to making the technology appear effective in the eyes of management. This led to a full implementation of the technology, which eventually led to rendering the account managers redundant. Thus, whereas symbolic

conformity is generally viewed as a safety valve to maintain actors' idiosyncratic ways of working, in our study, we saw that symbolic conformity had detrimental consequences for the very actors who performed it.

To explain this empirical surprise, we suggest that symbolic actions may, inadvertently, result in a radical change of the regime of knowing in the workplace. A regime of knowing comprises the specific knowing practices through which actors develop and use knowledge; the valuation schemes through which actions, people, and things are evaluated; and the authority arrangements that determine which actors have control over how the work is performed in certain tasks. We suggest that a regime-of-knowing lens is useful to understand the contestation that unfolds during technological change. New technologies are often associated with ways of knowing that challenge how the incumbent workers construct and use knowledge (Galison 1997, Knorr-Cetina 1999). Knowing practices are deeply entwined with the value that is attached to knowledge and the means of production thereof (Dussauge et al. 2015). Thus, changing existing knowing practices often incites a dispute over which values matter the most in a work domain (Thévenot 2001, Howard-Grenville and Carlile 2006, Nicolini 2012). Often, struggles over the appropriateness of knowing practices also involve hidden battles over who controls the way in which work is done and who has the authority to push such changes through (Galison 1997, Knorr-Cetina 1999, Hilgartner 2017).

Our longitudinal qualitative study of how data analytics technology got implemented in the business-to-business sales function of a telecommunications organization documented changes in the regime of knowing that were triggered by symbolic action. The regime of knowing originally guided focus on in-depth knowledge of customers via personal contacts and strong personal relationships. The transformed regime of knowing emphasized identifying customer needs based on data-analytic predictions, derived from the processing of large, historical data sets, and involved data scientists who were unfamiliar with the process of sales. The struggle between the sales account managers and the data scientists brought incommensurate views to the surface concerning the appropriateness of different knowing practices. This struggle often took place behind the scenes through symbolic actions. The incumbent sales workers enacted symbolic conformity by pretending to comply with the suggested changes. Similarly, the data scientists enacted symbolic advocacy by hiding the account managers' limited use of the data-enabled ways and proclaiming the new approach as a great success. Those symbolic actions unintentionally reinforced each other, thereby ironically accelerating the pace of change in the sales' regime of knowing.

This study contributes to the literature on technology and organizing by advancing a regime-of-knowing lens for studying technology introduction in the workplace. This perspective helps see below the surface of struggles over changing established practices. The regime-of-knowing lens shifts attention to the deeper challenges that actors are faced with, such as disputing what is worth knowing, what actions matter to acquire this knowledge, and who has the authority to make decisions around those issues. By approaching knowing practices as entwined with valuation schemes and authority arrangements, the regime-of-knowing lens helps understand why symbolic actions meant to defend and maintain knowing practices may have unintended consequences for the actors who perform them and thus can reinforce rather than avoid change.

Theoretical Background

The process of introducing a new technology in the workplace often results in changes in the nature of work and organizing (Zammuto et al. 2007, Leonardi and Barley 2010). Such transformation can be associated with struggles concerning who gains control over organizational processes and how work is performed (Noble 1984, Zuboff 1988). For example, digital technologies offer the possibility of transforming activities and redefining existing roles, work boundaries, and authority in ways that go to the core of a work practice (Barley 1986, Bailey et al. 2012, Barrett et al. 2012). Existing skills and expertise that are often tightly entwined with a work practice can be rendered obsolete by the resultant work changes (Ehn 1988, Christin 2017). Thus, it is not surprising that technologies that afford radical work changes are often misaligned with actors' existing expertise and ways of working and are likely to be treated with skepticism (Bailey and Barley 2011, Anthony 2018) or even resisted (Alvesson 2004, Lapointe and Rivard 2007).

Given that knowing is at the heart of work practices, the introduction of a new technology in a work domain has consequences on how actors construct and use knowledge (Knorr-Cetina 1999, Carlile 2002, Orlikowski 2002). Sometimes, technologies may automate tedious and repetitive tasks that actors often consider to be the unskilled part of their work. In such cases, the changes that technologies bring about in work practices are welcomed by most users (Zammuto et al. 2007, Newell et al. 2009, Leonardi 2013). In other situations, however, technology is associated with radical reconfiguration of the existing knowing practices through which actors come to know what they need to know to perform their work (Kraemer et al. 1987, Bailey and Leonardi 2015).

For example, the introduction of computerized information systems in paper mills has led to radical changes in operators' knowing of the production process, moving from direct sensory immersion with materials and machines to relying on information displayed by digital technologies (Zuboff 1988, Vallas and Beck 1996). The introduction of technology may even lead to a complete substitution of existing knowing practices with new ones, by automating work tasks and deskilling work originally performed by a group of experts (Noble 1984, Zuboff 1988, Bailey and Leonardi 2015). When the technology is associated with drastic reconfiguration or even complete substitution of the existing knowing practices, actors may engage in fierce struggles.

To explain how such struggles unfold and lead to radical changes in knowing practices, in the next section, we advance the regime-of-knowing lens.

Regimes of Knowing

The term regime is often used in various contexts in the social sciences to refer to an arrangement that provides a framework for guiding action and imposes "order on a domain or activity, typically through some combination of formal rules, informal norms, material means, and discursive framings" (Hilgartner 2017, p. 8). In political science, the notion of regime is used to abstract essential social, institutional, and legal arrangements. Similarly, regime has been adopted to describe the corpus of knowledge, techniques, and scientific discourses that historically constitute what society recognizes as truth (Foucault 1975). In science and technology studies, the concept of regime has been deployed to refer to the arrangement of norms, rules, and procedures that guide policy making (Jasanoff 2004) or the inherent assumptions, organizing principles, and patent ways to interpret data that constitute scientific work (Galison 1997). Regimes are consequential, by subtly shaping what, in retrospect, appear to be the natural ways to approach scientific inquiry. For example, the emergence of a regime of regulatory objectivity, predicated on the absence of an expert's interpretation, has increasingly led to systematic reliance on quantitative approaches (Cambrosio et al. 2006, Daston and Galison 2007). The notion of regime brings into focus the constructed and contested nature of ways of knowing, what counts as valuable knowledge, who has a say in how work is organized, and how power issues permeate this construction.

In organizations where a work environment is reasonably stable, an accepted and seemingly natural way of working and organizing emerges (Nicolini 2012). Actors tend to unreflectively embrace and inhabit a regime of knowing. A regime of knowing offers socially sanctioned conventions about what counts as valuable knowledge, about what actions are appropriate, and about authority arrangements. Thus, a regime of knowing guides what constitutes skillful performance, what tools to master, and how to approach problem solving in the workplace. Applying a regime lens to knowledge work is useful in order to represent the "'relevant realities' in which practices are embedded and the social devices that govern our ways of engaging with and articulating the world around us" (Howard-Grenville and Carlile 2006, p. 474). We argue that a regime-of-knowing lens is also useful to understand how work practices evolve when new modes of knowing enter the workplace. Three aspects of a regime of knowing can be distinguished: (1) the knowing practices that shape how actors develop and use knowledge in a specific work domain; (2) the valuation scheme that is used for evaluating performance, actions, people, objects, and ideas; and (3) authority arrangements that offer socially-sanctioned ways to structure collective activity, to organize work, and to coordinate tasks to ensure a skilled performance. As illustrated in Figure 1 and explained in the following paragraphs, these three aspects are strongly interlinked with each other.

Regimes of knowing are instantiated through knowing practices. By knowing practices, we refer to the situated activities through which actors come to know what they need to know to proficiently perform their work. Knowing how to act in particular circumstances is inextricably related to the actions that people perform (Schatzki 2001). For example, lawyers come to know how to set up their client's defense strategy not only based on their ability to recite the law. Rather, their knowing emerges through the practices of collecting and assessing evidence of their client's case, the interactions with the judge and jury, and other recurrent activities that they perform in their everyday work. Actors who work under the same regime of knowing perform similar knowing practices. Therefore, they tend to pay attention to similar objects and types of information and share distinct methods for

Figure 1. Regime of Knowing

Regime of knowing
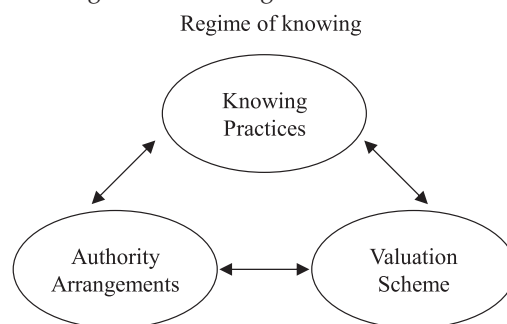
generating knowledge claims (Knorr-Cetina 1999, Carlile 2002, Bechky 2003). Knowing practices are constituted by the technology and tools used by the actors in their work, which fundamentally shape how actors conceive the world and produce knowledge (Orlikowski 2006).

Knowing practices are intertwined with specific valuation schemes that orient actors to what is worth knowing and what is proper action to produce valuable knowledge. Thus, valuation schemes determine what kind of information matters and what methods are important to acquire value from this information (Thévenot 2001, Dussauge et al. 2015). Actors who engage in the same practice share an evaluative orientation toward what is considered a good way of acting or knowing what is right or wrong (MacIntyre 1981, Nicolini 2012). Actors draw on these collective preferences and orientations to justify their beliefs and actions, as well as to convince others about what is a legitimate course of action in a particular situation (Patriotta, Gond and Schultz 2011, Cloutier and Langley 2013). Valuation schemes not only affect knowing practices, but they can also be shaped by them. For example, the emergence of TripAdvisor technology for sharing information about hotels has led to a shift in the valuation of hotels, from expert ratings by professional reviewers to evaluations based on the online reviews offered by guests (Orlikowski and Scott 2014). Valuation schemes also help determine whose knowledge matters most and thus which roles are rendered important in the workplace.

Both knowing practices and valuation schemes are also deeply entwined with the existing authority arrangements, as powerful actors or those in authority can decide what is worth knowing, and what this knowledge is worth. Therefore, regimes of knowing are also constituted through authority arrangements. Authority arrangements refer to socially sanctioned ways to organize, affording power to actors whose expertise is highly valued, to impact how they and others engage in the work (Bourgoin et al. 2020). Authority arrangements are fundamentally shaped by existing valuation schemes, because these are used to evaluate actors and their actions, thereby determining which actors have the right skills and expertise to control task performance (Abbott 1988, Galison 1997). By providing a shared understanding of how power is distributed in the workplace and which actors have the authority to determine how work should be done, authority arrangements can also deeply affect what is rendered as valuable knowledge, and which knowing practices are accepted to produce it.

Technology Introduction and Struggles over a Regime of Knowing

The process of introducing a new technology in a work domain is often associated with changes in the established regime of knowing (Orlikowski 2006, Introna 2016, Monteiro and Parmiggiani 2019). When new technologies become available, offering the promise of a different and potentially cheaper or more efficient way of working, actors face decisions on how to react. Often the new technology triggers actors to rethink their current ways of working and skill sets and can trigger apprehension for the incumbent workers whose work is affected by the technological change. It becomes especially challenging for the incumbent workers if the technology is associated with ways of working that require changes in the intertwined knowing practices, valuation schemes, and authority arrangements that make up the current regime of knowing. For example, in the field of strategy, one consequence of the shift toward PowerPoint-based presentations was that presentations became more linear, resulting in the simplification of complex and conflicting ideas, the backgrounding of situational data, and the subtle skewing of results to support personal agendas (Kaplan 2011).

Not surprisingly, actors can perceive a major shift in the regime of knowing as both an opportunity and a threat. It may lead to struggles between those actors who favor changes in the regime and those who have become attached to the established knowing practices and beliefs about knowing (Howard-Grenville and Carlile 2006, Fayard et al. 2016). Thus, struggles over a regime of knowing are often political, as actors compete to maintain or establish their authority over how work is performed and strive to impose their own valuation scheme and knowing practices. Such a struggle of political nature occurred, for instance, during the 1980s, with the arrival of computational models in the public policy arena. Modeling transpired to be a nonneutral addition to bureaucratic infighting and a way to shape and win policy debates (Kraemer et al. 1987, King and Kraemer 1993). Differences in what we call regimes of knowing shaped how computer modeling tools were enrolled in policy making. In the United States, models were rapidly adopted, not for providing an innately superior way of working, but because they could be weaponized in the bureaucratic struggles within and across government agencies. By comparison, in Germany, government policy was traditionally reliant on long-established and independent central bureaucratic entities that took pride in their own internal processes and expertise in supporting policies. As a result, these same computer models only saw limited adoption.

How incumbent workers respond to the challenge of technology-related changes often hinges on their professional authority and relative power within their organization. Actors with high authority are more able to defend their skills and expertise by rejecting the new technology (Lapointe and Rivard 2007) or are able to control how change in the knowing practices will take place (Barley 1986, Bailey and Barley 2011, Anthony 2018). For example, structural engineers (Bailey et al. 2010) and fire engineers (Dodgson et al. 2007), faced with the digitization of their work practices, agreed to most changes, but used their authority to disallow any automation of their engineering judgment and continued to use their traditional hand calculations. Actors who lack the authority to reject the changes are still able to avoid them by enacting evasive maneuvers. For example, they may perform workarounds, in other words, use the features of the technology in ways that deviate from the designers' intentions (Boudreau and Robey 2005, Azad and King 2008, Leonardi 2011). Alternatively, actors may only loosely couple their existing practices with the new technology-enabled practices to deal with the inconsistencies between their existing work practices and the newly introduced technology, thereby allowing them to continue with their work practices (Berente and Yoo 2012, Berente et al. 2016, Christin 2017). Finally, actors may choose to conceal their noncompliance and engage in symbolic conformity by pretending to adopt the new practices. Symbolic conformity is not intended to make a system work. It is rather a tactic for avoiding real use of the introduced practices and the values and assumptions associated with them (Oliver 1991, Zbaracki 1998, Hewlin 2003).

Often new technologies are accompanied by groups of technologists who are trained in their workings, believe in the promise that the technology represents a superior way of doing, and assume the role of advocates and promoters of the possibilities offered by the technology (Barley 1986, Kraemer et al. 1987). This may result in a wedge being driven between the incumbent workers affected by the technological change yet steeped in the existing ways of working and the technologists who are eager to transform those ways. If their proposed changes and reorganizations of work appear risky and politically uncertain, technologists may resort to symbolic advocacy. Symbolic advocacy is advocacy performed via symbolic actions that aim to attribute meaning beyond their substantive effect and that may be "deliberately employed in order to direct attention away from certain facts and towards others in order to protect sectional interests, gain resources and maintain or restructure institutional patterns of power and deference" (Brown 1994, p. 863). Technologists may specifically foreground the positive or performance-enhancing aspects of the associated changes and emphasize the potential effectiveness of the new way of working while keeping the eventual impact on incumbent workers in the shadows (Noble 1984, Brown 1995, Fiss and Zajac 2006, Zuboff 2019). Thus, symbolic advocacy can be an effective tactic in order to gain legitimacy and support from management and other stakeholders.

In sum, struggles arise when technologists introduce a technology that is associated with radically different ways of knowing, as both the technologists and the incumbent workers whose work is affected by the technological change have different stakes in the stability or evolution of the regime of knowing. In the next section, we report on our field study, which focused on how technologists and incumbent workers engaged in a contest, often at the symbolic level, about which knowing practices were appropriate to serve corporate customers.

Research Setting

Regimes of knowing become visible at moments of radical change, such as with the introduction of a technology that is associated with radically different knowing practices compared with those already established in the workplace. Significant moments of change may cause controversies and temporary breakdowns of everyday practices. Controversies and breakdowns trigger reflection by actors, who become aware of differences, focus on the things that matter to their own practice, and articulate their different perspectives in their effort to make the world comprehensible to themselves and to other members of the community (Sandberg and Tsoukas 2011, Nicolini 2012). At moments of controversy, power dynamics are reshuffled and actors articulate how they know what they know, what is considered a good way of acting, and who has authority to say how things should be done. During the controversy that unfolded with the introduction of data analytics technology in TelCo's Sales Medium department, the regime of knowing and how it evolved became visible to the authors.

TelCo is a large organization (about 16,000 employees) offering telecommunication services to a broad range of customers. Our research focus was on the business-to-business sales department that targeted medium-sized enterprises, known as Sales Medium. The department employed over 100 account managers, divided into 10 sales teams, geographically dispersed around the country. During a 24-month field study of TelCo (March 2013–March 2015), we observed the changes associated with the introduction of data analytics technology to support sales activities. By representing knowledge as an outcome of algorithmic transformations of decontextualized, digitized, and quantified information, data analytics

was associated with radically different knowing practices compared with the existing practices in the sales function. Before the introduction of data analytics, sales relied predominantly on human agents and their personal relations with customers.

All Sales Medium account managers were assigned a set of 250–300 customers with whom they built a relationship over several years. Account managers kept in frequent contact with their customers in order to identify sales opportunities and to generate leads for offering telecom and information and communications technology (ICT) services. A lead indicated that a customer had expressed interest in a product and wanted to receive an offer for a specific portfolio. Account managers described their work as "farming": through the careful tending of personal relationships and keeping track of corporate developments (e.g., the opening of new offices), they were able to identify new sales opportunities in a timely manner. They enjoyed multifaceted interactions with their contacts, through frequent lunches, taking them to sporting events, and even keeping track of their family and personal lives. The typical account manager held a vocational (non-university) degree focused on business or sales.

The separate Customer Intelligence department employed a group of data scientists, whose job it was to focus on data analytics techniques. They acted as the champions of data analytics and extolled its potential to revolutionize the operations of both marketing and sales. Although they had no formal authority over the sales department, they developed a data analytics sales tool, labeled the customer life-cycle management (CLM) model. Based on predictive modeling and optimization algorithms, the CLM model extracted actionable insights from historical and population-wide data about TelCo's customers and their transactions.

The CLM model was associated with knowing practices to identify sales opportunities that were radically different from existing practices. The model combined a number of internal and external data sources, such as time series of customer transactions, Nielsen market data, Gartner ICT spending predictions, financial data, and usage data. The output of the model was represented in a spreadsheet format that contained a list of all medium-sized customers and predictions regarding potential sales opportunities. The CLM model allocated customers to different customer segments (A, B, C, D) based on their historical and predicted sales with TelCo. For each TelCo product line (e.g., business telephone systems, mobile phone packages, fixed line setups), the CLM model assigned a position in the customer sales lifecycle (inform, specify, sell, maintain), each of which

entailed a different contact strategy. Thus, the model output consisted of a ranking of opportunities, with a prioritized action list for account managers.

All data scientists held higher education degrees (most often at masters' level) in engineering or econometrics. Their training also included additional specialized courses in data analytics, certified by a well-established institute of market intelligence and analytics. Many of them had been seconded to other companies that were leaders in applying data analytics to their operations. The data scientists viewed themselves as internal consultants, offering the benefit of their advanced training and techniques to improve the operations of "internal customers", such as marketers, campaign managers, and product managers.

In January 2012, the data scientists proposed the CLM model as a way to improve the efficiency and effectiveness of the Sales Medium sales process. At first, the data scientists tried to collaborate with the account managers, who were avoiding using the CLM model because of their reservations about the way it generated its recommendations. The account managers quickly resorted to feigning use and kept to their old ways of working. However, in February 2014, company management was swayed by the developers of the CLM model and decided to reorganize sales into a more efficient way of working. As a result, the account managers were unceremoniously dismissed, and the sales function became the responsibility of the data scientists. These events marked a drastic reconfiguration of the regime of knowing in Sales Medium, as outlined in Table 1. Before the introduction of the CLM model, the Sales Medium regime of knowing highly valued the maintenance of personal and trustworthy relationships with customers, and was focused on knowing customers via personal contacts, using account managers' gut feelings to identify sales opportunities. Because of their unique position in managing customer relations, the account managers had the authority to control the sales process. However, by the end of 2014, the regime of knowing in Sales Medium was radically different. Acting rationally and efficiently was valued as being more important than fostering customer relationships. Sales opportunities were identified based on predictions calculated by processing large population-wide and historical data sets. Because they were responsible for developing analytical insights, the data scientists gained authority over this task, taking control over which customers should be called, when, and about which portfolio offers.

Data and Methods

The sources of evidence we used included ethnographic observations, interviews, and documentation. The first author spent 24 months (starting from

Table 1. The Regime of Knowing in Sales Medium

Regime of knowing in Sales Medium before the introduction of the CLM model (2012) Focus on relationship-based knowing	Regime of knowing in Sales Medium after the reorganization (2015) Focus on algorithmic knowing
Knowing practice: Generating highly contextualized knowledge based on personal contact with the customer, using intuition and experience Representative quote: "Most times people say that account managers are people who talk a lot, but it's the opposite. Good account managers are people who listen very carefully, ask the good questions the right way, feel when a customer needs something, and back off when he doesn't want to. . . It's just listening carefully to what the customer is saying…"	**Knowing practice:** Generating knowledge through algorithmic processing of large datasets consisting of factual data that is stored in accessible databases Representative quote: "Yeah, but you can also do it for acquisition. You can order all these potentials—so you have a potential for acquisition, potential for churn, and potential for cross sell, and the highest potential is on top. And when you see that this customer has, for instance, a high probability for cross selling, and the potential is large, then perhaps you can put this certain phase on sell…"
Valuation scheme: Having a personal and trustworthy relationship with the customer is important to perform well in sales Representative quote: "I'm a 'farmer'… I want to know my client, and after a while, I'm a strong believer that when you know a client and they know you, and they know they can trust you, you get a lot more business from it. So, for me it's very important to know my customers, and that they know who I am, and that they can find me, and that they know I am the one who solves everything for them."	**Valuation scheme:** You need to act rationally and as efficiently as possible. Acting based on the algorithmic outcome is more rational and efficient Representative quote: "Sometimes I just say, 'OK, you shouldn't target those people, because chances are low that they will respond. They don't want that product, we see that based on the models.' They are like 'Yeah… but our target is that we just have to get as many new customers as we want and I now have some budget, so I'm just going to do this campaign anyway.' OK, but it's not as efficient as they could have been. Basically, I'm just saying this to them and hope they act in the way I would like."
Authority arrangement: The sales process should be controlled by the account manager because s/he is in contact with the customer. This includes interfering with closing of the deal. Representative quote: "Because it's my customer, and I have my own customers, it's my own set, and it's my responsibility, it's my work to make it a commercially attractive company for TelCo. So, then I'd rather hear it for myself, and try to adjust that feeling from the customer, by maybe helping him with some things, and by making myself a trustworthy advisor."	**Authority arrangement:** The task of identifying sales opportunities should be separated from the act of calling the client. The role of the data scientist is important because s/he develops analytical insights for organizing the sales work. The role of the account manager is reduced to that of a caller. Representative quote: "I'm not only a provider of data and insights. I want to be actively involved in sales. OK, they need information, but how can I help them to also get towards an answer to the questions they have? Because just providing the information is still not an answer. You have to process it and you have to change the way in which they come up with an action."

March 2013) at TelCo as a passive participant, observing the work and interactions of both account managers and data scientists (Spradley 1980). By shadowing different account managers for a whole working day at a time, she observed how they worked, planned their everyday work, contacted their customers, and used the CLM model. She kept detailed notes about the actions of the account managers, including how they used various information systems in their work. Additionally, she engaged in informal discussions with them during their lunch breaks. The account managers were always very talkative and would often turn to the researcher and explain to her what they had been doing on their computers or what they had been discussing with a contact on the phone. Similarly, the first author also shadowed the data scientists, specifically those involved in the construction of the CLM model. She observed, for instance, how they worked while preparing queries and algorithms for the CLM model and attended their meetings with other stakeholders to discuss the development of models.

The shadowing experience with the data scientists was different from the shadowing of account managers. The data scientists remained focused on developing their code and would talk only if the researcher asked them specific questions. While explaining the algorithms they were developing, the data scientists would also explain their views on the CLM model; the knowing practices that they viewed as important for the sales function; the valuation scheme that mattered to them; and the authority arrangements that they considered ideal in Sales Medium. Field notes were complemented with photographs of the participants in action and of their workspaces. Shadowing was often followed by an interview to gain more insight into informants' subjective perspectives.

Another type of observation involved meetings, which shed light on the microdynamics of interactions (Feldman and Orlikowski 2011) between organizational members. In particular, the first author, together with one of the other researchers, observed two types of meetings: First, kickoff presentations

that were held on a quarterly basis and constituted the main occasions for the two groups to meet face-to-face. In these presentations, the data scientists put forward new versions of the CLM model, and a marketing manager unveiled new campaigns that were running in that quarter. Furthermore, the first author also observed some of the weekly customer intelligence team meetings, in which the data scientists would discuss updates on their analytics projects and their plans for future projects. She regularly forwarded her field notes to the other authors for discussion and collective sense making.

Semistructured interviews with data scientists, account managers, sales team managers, and other roles constituted another important source of evidence (Weiss 1995). The interviews were conducted by the first author. Following each interview, she wrote up a research diary entry and shared her memos with the rest of the team, to discuss insights, look for emerging themes, and consider what to prioritize in subsequent interviews. The interviews focused on individuals' work practices and their views of the CLM model. During these sessions, interviewees described how they dealt with the challenges they faced and explained the rationale behind their actions. They also elaborated on their views about how work should be performed, what kind of knowledge mattered, and why the CLM model was or was not useful. We often asked participants to bring their laptops to the interviews, or requested to spend some time with them at their desks, so that they could show us in detail how they made plans and how they prepared for contact with customers. Because we entered the field about one year after the CLM model had been first presented to Sales Medium, parts of the interviews referred to what had happened in the previous year. Different interview guides were prepared for each type of informant (account manager, data scientist, director, etc.). Over time, those interview guides were adjusted following specific events (e.g., the announcement of layoffs) and became more focused (e.g., specific questions asking why actors performed a specific action once that action was identified). Each interview guide was also slightly adjusted if it was conducted after having shadowed the informant at work. The interviews took place throughout the duration of the study, until all the account managers were laid off. We also undertook a few complementary interviews one year after the fieldwork to follow up how things had evolved in TelCo since then. All interviews were recorded, transcribed, and shared between the authors to ensure common understanding of the data.

Finally, a variety of documents were used in order to triangulate information from the interviews and, in particular, to verify any retrospective information. We used public documents (such as press releases and TelCo annual reports), news items, PowerPoint presentations (mainly from the kickoffs), and Excel sheets that included the variables (and descriptions of

Table 2. Overview of Collected Data

Type of data	Type of informants	Number	Total time (hours)
Interviews	Account managers from Sales Medium	30 interviews	28.4
	Data scientists	17 interviews	15
	Fired account managers from Sales Medium	3 interviews	2.2
	Account managers from other sales channels	17 interviews	16.8
	Sales team managers from Sales Medium	5 interviews	5.2
	Campaign manager	2 interviews	2
	Marketers	2 interviews	2.3
	Sales directors	2 interviews	1.1
Observations (shadowing)	Account managers from Sales Medium	3 days of observations (shadowing)	24.5
	Data scientists	8 days of observations (shadowing)	51
Observations of meetings	Kick-off presentations from data scientists and campaign manager to account managers and sales team managers	3 meetings observed	3.2
	Weekly meetings of the data scientists' team	7 meetings observed	6.5
Unofficial meetings	Data scientists	15 meetings with data scientists and the Manager of Customer Intelligence	15
Personal notes (diary of researcher)	Based on interactions with all respondents	—	—
Documents	Internal documents	43 documents	—
Documents	Public documents	23 documents	—
Documents	News	9 documents	—

Notes. The total number of interviews was 78, with a total recorded time of 73 hours. The total number of observations was 21, with a total observation time of 85.2 hours. The total number of documents was 75.

those variables) included in the CLM model. An overview of all collected data is provided in Table 2.

Data Analysis

Because of the processual nature of our research question, we followed a process research approach (Langley 1999) to track the flow of events and to understand why things unfolded in a particular way. The complexity of the data and the variability of their temporal embeddedness led us to use a multitude of strategies.

First, we constructed a case narrative. The case narrative is a useful strategy to enrich understanding of a phenomenon, as it includes contextual details that capture the richness and complexity of the setting (Langley 1999). We created an event list (Poole et al. 2000) to maintain our chain of evidence and identify patterns, and we used this as a scaffold while alternating between the different sensemaking strategies and literature. Using the event list, we constructed a detailed story from the raw data that helped us construct the chronology of events, identify linkages and patterns between different types of events, and find emerging themes (Pettigrew 1990). Using quotes from the interview transcripts, the case narrative voiced the perspectives of the data scientists, account managers, sales team managers, the campaign manager, and higher management. The narrative was further enriched with observations captured in the field notes and evidence from the additional documents. Fictional names were used to enhance the readability of the story without compromising the anonymity of informants. As we identified important events that signaled change (e.g., decisions from higher management), we used temporal bracketing to structure the narrative into three periods.

Second, we used the strategy of thematic coding. During the fieldwork, we had already performed inductive coding in order to track the different work practices of the data scientists and the account managers; their different views over sales work; their interaction with the algorithmic technology (CLM model); and the actions that they performed to deal with their struggle. The construction of the narrative helped us shift to thematic coding, which included several iterations after reading the literature on technology implementation and knowing in practice. The theme of regime of knowing emerged as important, since the struggle between the account managers and data scientists concentrated on three interrelated aspects: the knowing practices that were performed to find sales opportunities; the valuation scheme that guided what good sales work entailed; and the authority arrangements that determined which actors controlled how the sales work was done. As the participants articulated their views on knowing practices, valuation schemes, and authority arrangements

while in conversation with each other or with the authors, we were able to track what the regime of knowing in Sales Medium was like before the introduction of the CLM model and how it came to be eventually, after it was restabilized with the reorganization of Sales Medium. We provide this comparison in Table 1.

Third, we performed further thematic coding while tracking the actions that different actors performed as they engaged over the three aspects of the regime of knowing in Sales Medium. We found that many of these actions were performed symbolically. Those symbolic actions were further refined into symbolic conformity, performed by the account managers to appear as if they were conforming to the changes while trying to defend their knowing practices; and symbolic advocacy, performed by the data scientists to gain authority and establish the knowing practices and valuation scheme associated with the CLM model, by obscuring the unfolding changes associated with the technology and only presenting their positive side.

Fourth, we performed process analysis. We returned to the case narrative and the event list to develop a process explanation. We compared the various actions performed by each group of actors and traced how these had consequences for other actions. We coded each action for whether it concerned a type of symbolic action, the nature of the symbolic action if applicable (symbolic conformity or symbolic advocacy) and which part of the regime it engaged with (e.g., whether the action was meant to defend the knowing practices). We traced the consequences of the symbolic actions to theorize about their impact on the change process. We also found it important to trace the consequences of actions that were not symbolic but which had been triggered by former symbolic actions. The impact of those actions alone was not sufficient to change the regime of knowing, but those actions enabled later symbolic actions to occur and thus, indirectly, had an effect on the regime change. Finally, we analyzed how each action or set of actions impacted the regime of knowing. This comparison is summarized in Tables 3, 4, and 5. This process analysis helped us theorize about why people interact via symbolic actions and how such symbolic actions enable change in the regime of knowing.

The Implementation of Analytics in Telco Sales Medium

In this section, we analyze how the struggle over incommensurate ways of knowing unfolded after the introduction of the CLM model in Sales Medium and how it led to a radical change in the regime of knowing. During the struggle, both the account managers and the data scientists performed various symbolic actions in their efforts to affect the knowing practices, valuation schemes, and authority arrangements.

Table 3. Actions Performed During the Period of Attempted Collaboration and Their Impact on the Regime of Knowing

Action label	Action and symbolic nature	Aim of action	Action trigger	Consequence	Impact on the regime of knowing
DS1	Data scientists team up with the campaign manager and participate in regular meetings that he organizes to discuss the running campaigns.	Affect authority arrangements	Resistance faced at the first meeting.	The data scientists gain regular access to the sales teams. This triggers symbolic action AM 1, because account managers are expected to participate in those meetings.	*Impact on authority arrangements:* Account managers cannot ignore the data scientists.
AM1	Account managers attend meetings symbolically. <u>Symbolic conformity:</u> Finding no use in the presentations, but aiming to appear collaborative.	Defend knowing practices	DS1	Data scientists gain presence in Sales Medium. This enables symbolic action DS2.	
DS2	Data scientists frame the model as a supportive tool, rather than a mandatory change. <u>Symbolic advocacy:</u> Aiming to change the current way of working, but trying to "massage" the account managers.	Promote a new valuation scheme	AM1	The CLM model becomes known as an alternative way of finding sales opportunities. This triggers account managers to reflect on the usefulness of the CLM model and provide an explanation (AM2) rather than simply ignore.	*Impact on valuation scheme:* Two competing sets of assumptions for how sales work should be done.
AM2	Account managers explain their views about importance of customer relationships.	Defend valuation scheme	DS2	This triggers the data scientists to explain how the CLM model works (DS3) to motivate the account managers to use it. It also informs the data scientists' action to track the use of the CLM model to prove its effectiveness (DS4).	
DS3	Data scientists discuss the model's inner workings and ask for feedback.	Get new knowing practices used	AM2	This initiates a conversation with the account managers, who reflect on the CLM model and provide feedback (AM3).	*Impact on knowing practices:* Acting upon the analytics becomes a known practice.
AM3	Account managers provide feedback to data scientists.	Defend knowing practices	DS3	This informs the data scientists about ways to adapt the CLM model so that the account managers find it useful (DS7).	

Notes. Action labels starting with DS indicate actions performed by the data scientists. Action labels starting with AM indicate actions performed by the account managers.

As we will show in the sections that follow, those symbolic actions had consequences for the evolution of the regime of knowing. Based on the findings that we report, we developed a process model of change of a regime of knowing through symbolic actions (Figure 2). Although the main concepts and process model have been inductively developed, we present them in advance to help readers understand the theoretical

significance of dynamics in the case history (Berends and Deken 2020). As we explain later, our model captures the changes of the regime of knowing in each of the three time periods of our narrative.

Our model depicts incumbent workers (in our case the account managers) and technologists (in our case the data scientists) enacting distinct sets of symbolic actions: The account managers enacted symbolic

conformity by merely appearing to conform to the suggested changes, in their effort to defend their existing knowing practices. The data scientists enacted symbolic advocacy by obscuring the unfolding changes associated with the technology and only presenting their positive side, in their efforts to gain authority and change the accepted knowing practices and valuation scheme. As we will show, the account managers' actions of symbolic conformity enabled the data scientists to enact symbolic advocacy that, in turn, reinforced further symbolic conformity by the incumbent workers. This mutual reinforcement between symbolic conformity and symbolic advocacy became a mechanism for the transformation of the regime of knowing, because the three aspects of a regime of knowing (knowing practices, valuation scheme, authority arrangements) were intertwined such that change in one aspect of the regime eventually led to changes in the other two. This is depicted by the bidirectional arrows connecting the three aspects of a regime of knowing in Figure 2.

We structure the remainder of this section into three sections, representing the three periods of the narrative. In presenting the findings, we explain how the interactions modeled in our process model in Figure 2 are instantiated in each of the three periods, leading to gradual changes of the regime of knowing in the Sales Medium function at TelCo.

Period of Attempted Collaboration

In the first period, the CLM team made various attempts to bridge the differences between them and the sales team and collaborate with the account managers (see Table 3 for a summary of the actions and their impact on the regime of knowing in this period). In early 2012, the data scientists introduced the CLM model and its new way of approaching sales at an information session attended by most of the account managers. Contrary to the data scientists' expectations, the account managers did not appear interested nor did they engage any further:

> In the beginning, we first did a presentation for the Sales Medium about the model for all the teams together in one session. And then we introduced the model, and everybody was sitting there, 'OK, OK, maybe for others, but I don't think I have to do it.' (Data scientist)

To overcome the account managers' lack of interest and to engage with them, the data scientists reached out to the campaign manager responsible for the campaigns that ran in Sales Medium. The campaign manager was liked by the sales teams and met with them on a regular basis. He wanted to improve the campaign management process and therefore supported the CLM model, encouraging the account

managers to use it. Thus, by teaming up with the campaign manager, the data scientists ensured that they could gain direct access to the sales teams via regular meetings and had someone on the inside who would promote the CLM model to them.

The account managers who participated in the meetings did not find the presentations by the data scientists useful. However, they only attended them so that they and their sales team manager appeared collaborative:

> I've seen these presentations four or five times . . . So, after two times I told my manager, 'very nice to be there, but it has no added value for us to be at the presentation.' Because the presentations are pretty much the same: 'We've changed this, we've changed that, blah blah blah blah. . . .' This is it. But it's politically good to be there. For my manager, to have his complete team there, and for us to show our faces. So we go. . . . (Account manager)

Thus, the account managers symbolically conformed by attending the meetings with the data scientists, despite having no interest in the talks about the CLM model, and only attended to look collaborative and stay informed about the latest campaigns. Nevertheless, this worked well for the data scientists, as they were now able to establish regular face-to-face contact with the account managers, thereby gaining a legitimate foothold in Sales Medium. By attending the joint meetings, the account managers could no longer simply ignore the data scientists and their alternative view of sales work. Although the account managers may have engaged in the meetings primarily for symbolic reasons to appear collaborative, the net effect was that the data scientists became legitimate participants and were enabled to put forth a different valuation scheme and claim authority in the sales regime of knowing.

The data scientists met with the sales teams twice each quarter: at kickoff meetings at the start of each quarter and at evaluation meetings one month later. In those meetings, the data scientists tried to demonstrate the value of the CLM model by emphasizing how the tool could support account managers in increasing their sales, while simultaneously trying to avoid making it look like a threat to the existing ways of working. This was a symbolic advocacy tactic by the data scientists: Although they believed that the current way of working in sales was inefficient and aimed to change it, they carefully tried to mitigate the defensiveness of the account managers by framing the value of the model as a supportive tool, rather than a mandatory change in the way of working:

> A year ago I went to a presentation of the model with [the campaign manager], and they [account managers]

were sitting there just like that *[crosses her arms tightly]*, 'Oh, I know my customers myself! Why do I have to use the model? . . . And it takes a lot of time for me . . . .' So it wasn't a nice presentation! *[chuckles]* So that's why we've got the model, but also a lot of massaging egos, just to try get the model accepted. (Data scientist)

Such interactions forced the account managers to engage in conversations to explain why they valued talking to their customers and forming deep relationships with them. The two groups sparred over the nature of knowledge and the relevance of each other's valuation scheme:

> Kelly [data scientist] explains how the model predicts the roaming [sales possibility]. One account manager jumps into the conversation: 'But remember, this is an indication. You have to feel them [the customers] when you are sitting with them at the table.' Kelly replies that her numbers are based on historical data. (From fieldnotes during kickoff meeting)

The kickoff meetings led to significant interactions over the different knowing practices. The data scientists used these meetings to present the workings of the CLM model and used the evaluation meetings to obtain feedback from the account managers to understand how the CLM model could fit in with the account managers' way of working. The account managers provided some feedback on how to improve the tool and explained that they had tried using the CLM model but did not trust its output. The account managers continued to avoid working with the CLM model:

> So, we received the CLM model once, and I opened it and I saw three faults in it, and I thought, 'Ah let's not bother,' and closed it again. Yeah . . . useless. . . . (Account manager)

To summarize, in this period, the data scientists tried to collaborate with the account managers. To maintain their way of working while appearing collaborative, the account managers attended the meetings with the data scientists symbolically. This symbolic conformity, however, had an impact on the regime of knowing: The data scientists became legitimate participants in Sales Medium, which, consequently, affected the authority arrangements. The data scientists were then enabled to enact symbolic advocacy, by symbolically framing the technology as nonthreatening and supportive. In this way, the data scientists pushed the use of the new technology as a valuable way of working and thus had an impact on the existing valuation scheme. Through these interactions, the CLM model came to be acknowledged in Sales Medium as a possible alternative way of finding sales opportunities, even though it did not (yet) affect the actual knowing practices.

Period of Limited Mutual Adjustment

The period of attempted collaboration was followed by a period of limited mutual adjustment, in which the data scientists and the account managers appeared to accommodate their differences by adjusting their practices. However, those adjustments were rather minimal or even just pretend (see Table 4 for a summary of the actions and their impact).

In the second quarter of 2012, the data scientists started tracking the leads generated by the account managers, with the help of the CLM model. To address the account managers' concerns, the data scientists wanted to prove that the tool was an effective way of working. Therefore, the data scientists asked the account managers to use a specific code in their sales support CRM system when registering leads generated with the use of the CLM model. As very few account managers used the CLM model, initially the numbers of leads registered by most sales teams were very low. However, there was one sales team that did start registering leads with the CLM code. Their manager, Kate, was the only sales team manager who supported the CLM model on its introduction. Driven by her ambition to lead a successful team, Kate encouraged her account managers to support the CLM model. However, often, Kate's team members only symbolically registered leads with the CLM code, without actually having used the model:

> She [Kate] tells us to use it [the CLM model] . . . We always add the code [when registering the leads] . . . But when my colleague calls me and says, 'We have a client,' then I've found the sales opportunity from him and not from using the CLM model. But, still, I have to add the CLM code, even if the opportunity did not come from the CLM. (Account manager)

This symbolic conformity was enacted by Kate's account managers to defend their actual knowing practices, but it had unexpected material consequences. Although the leads with the CLM code were registered for symbolic reasons, the CRM database started to accumulate data indicating that the model had been used. Thus, the symbolic conformity action aimed at defending the knowing practices had an impact on the valuation scheme, because there were data suggesting that the CLM model was a valuable way of working, at least for some.

This symbolic conformity also helped the data scientists, as they were able to extract these data and use them to argue that the CLM model worked and to convince the account managers to use it more often. More specifically, the data scientists started benchmarking the number of leads registered with the CLM code per team and presented this comparative analysis at the quarterly kickoff meetings with the account managers. They presented Kate's team as

Table 4. Actions Performed During the Period of Limited Mutual Adjustment and Their Impact on the Regime of Knowing

Action label	Action and symbolic nature	Aim of action	Action trigger	Consequence	Impact on the regime of knowing
DS4	Data scientists ask account managers to register leads with the CLM code to confirm the tool's usage.	Legitimize the new valuation scheme	AM2, AM3	This triggers account managers to register symbolically, as their team manager wants them to support the CLM model, but they do not want to change their knowing practices (AM4).	*Impact on valuation scheme:* The CLM model appears to work for some.
AM4	Account managers in Kate's team start registering leads with the CLM code symbolically. Symbolic conformity: Pretending to use the CLM model while performing own knowing practices.	Defend knowing practices	DS4	Data in CRM system indicate that the CLM model is used by some account managers. This enables the data scientists to show that the CLM model is being used by some (DS5, DS6, DS8).	
DS5	Data scientists benchmark registration numbers. Symbolic advocacy: Avoiding comparison with other sales metrics to show CLM model is a good way of working.	Promote the new valuation scheme	AM4	Registration numbers in the presentation slides make early adopters appear as champions. This triggers more symbolic registration (AM5).	*Impact on valuation scheme:* The CLM model appears to be an effective way of working. *Impact on authority arrangements:* Data scientists increase their influence by achieving to put pressure on account managers.
AM5	Account managers register leads with the CLM code symbolically. Symbolic conformity: Pretending to use the CLM model while performing own knowing practices to get rid of the pressure.	Defend knowing practices	DS5	More data accumulated in the CRM system indicating that the CLM model is used. This enables the data scientists to show that their model is successfully used (DS6, DS8).	
DS6	Data scientists celebrate increase in registration numbers as success of model use. Symbolic advocacy: Avoiding thorough analysis of registration numbers to show CLM model is a good way of working.	Legitimize the new valuation scheme	AM4, AM5	Benchmarking the registration numbers at presentations triggers account managers to register more (AM5).	
DS7	Data scientists update the CLM model output with additional information fields. Symbolic advocacy: Avoiding changing the algorithmic models, doing minimal updates to make account managers use the tool.	Get knowing practices used	AM3	The updates trigger the account managers to open the tool to easily find information (AM6).	*Impact on knowing practices:* Both groups engage more actively with the different knowing practices.
AM6	Account managers use the additional information.	Enhance existing knowing practices	DS7	This legitimizes the registration of leads with the CLM code (AM7).	

Table 4. (Continued)

Action label	Action and symbolic nature	Aim of action	Action trigger	Consequence	Impact on the regime of knowing
AM7	Account managers register leads with the CLM code, as they use the additional fields. Symbolic conformity: Appearing to act upon the predictions, while only using the additional fields and relying on direct contact with customers.	Defend knowing practices	DS7	Triggering more registration of leads with the CLM code, even though the predictions are not used. This also enables the data scientists to celebrate the success of the CLM model (DS6, DS8).	*Impact on valuation scheme:* The CLM model is valued as a complete information tool.

Notes. Action labels starting with DS indicate actions performed by the data scientists. Action labels starting with AM indicate actions performed by the account managers.

championing the CLM model and shared their "success story" with the other sales teams. However, the data scientists' action meant to advocate the value of the tool was also symbolic. The data scientists presented the leads registered with the CLM code because it supported their argument. However, as acknowledged below, they avoided presenting the total sales performance per team and only benchmarked the registration data:

> If you just have four big customers that want to get all their mobile phone contracts with TelCo and you didn't use the model but you're just lucky, like I said, then you can have a small number of orders with very high revenues. So we do it [comparing with other sales metrics], but we don't want to get it known, that's all. (Data scientist)

This symbolic advocacy enacted by the data scientists affected authority relationships: The data scientists gained influence in Sales Medium by putting pressure on the other sales teams to use the CLM model. These other account managers responded by following the example of their colleagues in Kate's team: registering sales leads with the CLM code without having actually used the CLM model to generate those leads:

> The data scientists want us to use the CLM and asked us, 'When you have a sales opportunity in CRM, just add the CLM code.' So everybody did it. So now it seems as if all the sales opportunities came from CLM, but in the real world, that's not true. So everybody thought, when we sign the CLM code, we get rid of them, and then we don't have the pressure. . . . (Account manager)

Thus, the symbolic advocacy performed by the data scientists, made possible by the symbolic conformity initially enacted by Kate's team, resulted in reinforcing the acts of symbolic conformity that were now performed by more account managers. This increased symbolic conformity also created actual consequences:

More data accumulated in the CRM system, suggesting that the CLM model was widely used. Table 6 shows the registration numbers per sales team per quarter. The data scientists acted on these data to strengthen the apparent effectiveness of the CLM model. They continued presenting the registration data to the sales teams at the kick-off meetings and celebrated the increase in the registration numbers as a success of the CLM model, to motivate the account managers to work more with it:

> The campaign manager opens the next slide named 'Registration in the CRM system.' He explains that the account managers need to add the CLM code when registering leads to trace model usage. Then he presents the results of the registration and says, 'The numbers of won orders [marked with the CLM code] are much higher than before!' He thanks the team. (Fieldnotes from kickoff meeting).

However, this was also a symbolic advocacy action, because the data scientists continued to avoid investigating the veracity of those registration numbers and did not compare them with other data from the CRM system. This was highlighted by the head of customer intelligence, after several quarters of benchmarking the registration numbers at the kick-off meetings:

> If there's a lot of pressure to use this code, we should validate if this code is used this way, meaning that they're not using it so they can say to their manager that they've been using the model. So we want to validate that at a later stage. I think somewhere in the fourth quarter [i.e., 2013-Q4]. (Head of customer intelligence)

Although account managers registered the use of the CLM code symbolically to defend their knowing practices, the regime of knowing was affected nonetheless. The data scientists were enabled to perform symbolic actions while advocating for the new technology and were thus able to put more pressure on the

account managers, which had an effect on the authority arrangements. By making the CLM model appear to be an effective way of doing sales, this also affected the valuation scheme.

Next to the registration of leads, the data scientists and account managers started adjusting their knowing practices. These adjustments were, again, of a symbolic nature. Acting on the feedback collected in their meetings with the sales teams, the data scientists started adding extra fields to the output of the CLM model to meet the information needs of the account managers, such as more information about the duration of customers' contracts. This action, however, was mainly performed symbolically, because the added changes were minimal and did not affect the algorithmic knowing practice that the CLM model represented. Instead of changing their algorithmic models based on the account managers' feedback, the data scientists only added extra information fields to the spreadsheet, such as contract termination dates. Adding this information did not cost the data scientists much time or effort. However, it did show that the data scientists took the feedback from the account managers into consideration. The data scientists assumed that this extra information would trigger the account managers to use the spreadsheet with the CLM model output, because the account managers already used that same information in their everyday work, but up until then they had had to search for it in various other information systems. As one of the data scientists noted:

> Because for out-of-contract information, they [account managers] really have to look in the customer view mobile system, and have to apply all kind of filters... And for us it's a piece of script [scripting language] and we can put it in. . . . (Data scientist)

The data scientists' symbolic advocacy action of updating the CLM model every quarter was materialized in the spreadsheets containing the model output. As expected by the data scientists, this triggered the account managers to open the spreadsheets more often to find the additional information more easily and use it in their work. By using the additional fields, the account managers could legitimately say that they were using the CLM spreadsheet and had a legitimate reason to register more leads in the CRM system with the CLM code. However, this was merely an act of symbolic conformity to maintain their knowing practices, as the account managers mainly just used the additional information, and continued not to use the predictions of the CLM model, which were supposed to be the main aspect that would change their way of working. They also continued to rely on direct contact with their customers as, for them, this was the most effective way of finding sales opportunities. One account manager admitted his nonreliance on the CLM

model: "mostly I don't use it. I use it for certain facts, of course it's nice to know when certain contracts terminate." Another account manager acknowledged how little his knowing practices had changed:

> Because I speak with the client, and the client knows best what he wants and what he needs, and not just a system that says yeah, based on numbers, this is the potential. You have to speak to the client to really know what's going on... So we're using CLM just as support; that's not what the client wants or is. It's just a support. The true information comes from the customer himself. . . . (Account manager)

In sum, in this period the account managers and data scientists performed mutual adjustments, but these mainly took symbolic forms. Table 4 shows how the symbolic conformity actions by the account managers triggered symbolic advocacy by the data scientists, and vice versa. The account managers enacted symbolic conformity and pretended to use the CLM by registering their sales leads into the CRM system, without actually using the CLM model. In addition, the data scientists advocated the changes associated with the CLM model via symbolic means. They pretended to modify the CLM model to make it more useful for sales but did so with the trivial addition of new fields based on pre-existing model data. The account managers enacted symbolic conformity by using the improved model in the most basic way, so that they could maintain their knowing practices. They started using a small set of information from the model as support (e.g., contract termination dates), without changing their main way of working. Yet, all sides agreed that the CLM model was being used in Sales Medium. These symbolic actions had consequences for the regime of knowing. First, the valuation scheme was affected, because the CLM model became established as an effective way of doing sales. Second, the data scientists strengthened their authority, because of their involvement in managing the model and its data and by customizing it to the needs of the account managers. Finally, as both groups seemed to engage more actively with the different knowing practices, it appeared as if there were positive developments on that aspect. Yet, account managers continued to rely on their traditional relationship-based knowing practices, while minimally interacting with the CLM model.

Period of Managerial Intervention

The period of limited mutual adjustments was followed by a period of managerial intervention, in which higher management intervened in the unfolding struggle over the regime of knowing. Taking into consideration the power of higher management at TelCo, these interventions ended up being highly influential for the evolution of the regime of knowing in Sales Medium.

Table 5. Actions Performed During the Period of Managerial Intervention and Their Impact on the Regime of Knowing

Action label	Action and symbolic nature	Aim of action	Action trigger	Consequence of symbolic action	Impact on the regime of knowing
DS8	Data scientists present registration data to higher management. Symbolic advocacy: Presenting without having checked whether analytics is really used, to gain management support.	Gain authority	AM4, AM5, AM7	Convincing management to support the data scientists (MG1).	*Impact on valuation scheme:* The CLM model becomes the legitimate way of working in Sales and becomes part of the evaluation of sales work. *Impact on knowing practices:* The CLM model becomes part of the training for new account managers.
MG1	Higher management supports the CLM model and push account managers to use it.	Affect knowing practices	DS8	This encourages the data scientists to try to expand the influence of the CLM mode, e.g. by making it an evaluation tool (DS9), or by suggesting changes in Sales Medium (DS10). It also increases the pressure for the account managers and triggers more symbolic registration (AM8).	*Impact on authority arrangements:* The data scientists have support from higher management to affect the work in Sales more directly and increase pressure on account managers.
DS9	Data scientists make the CLM model a tool for evaluating account managers' performance.	Affect the valuation scheme	MG1	This indicates that the data scientists had sufficient authority to impact how Sales Medium was organized. It also shows that the CLM model was now the legitimate way of working. It resulted in increasing the pressure on the account managers and triggering more symbolic conformity (AM8).	
AM8	Account managers increase the symbolic registration of leads with the CLM code. Symbolic conformity: Pretending to use the CLM model while performing own knowing practices, to appear compliant and avoid the high pressure.	Defend knowing practices	MG1, DS9	Data in the CRM system show a success story, making the CLM model appear as if it is widely used and effective. This later informs higher management to frame the reorganization as a change toward making sales more data-driven and efficient (MG3).	
DS10	Data scientists suggest changes based on data analyses to higher management to make the Sales Medium function more efficient.	Affect the knowing practices	MG1	This informs higher management's decision to reorganize the Sales Medium (MG2) and to frame the reorganization as a change toward making sales mode data-driven and efficient (MG3).	*Impact on valuation scheme:* Acting efficiently based on data analytics becomes established as the appropriate way of working in Sales Medium.
MG2	Higher management reorganizes the Sales Medium function by outsourcing to external sales organizations.	Change the knowing practices	DS10 & Need to cut down costs	This has a direct impact on the knowing practices in Sales Medium as it ceases the practices performed by the	*Impact on knowing practices:* The CLM model becomes the main tool for

Table 5. (Continued)

Action label	Action and symbolic nature	Aim of action	Action trigger	Consequence of symbolic action	Impact on the regime of knowing
				account managers. It also entails more involvement of the data scientists in customer allocation (DS11).	communicating sales opportunities to the external sales organizations. *Impact on authority arrangements:* The data scientists gain authority over the task of finding sales opportunities and increase their overall authority in Sales Medium. The account managers lose all of their control as they get fired.
MG3	Higher management frames the reorganization as becoming more data-driven and efficient. Symbolic advocacy: Actual need to cut down costs is framed as a positive change.	Stabilize the valuation scheme	DS8, AM8, DS10	The CLM model is mentioned in all presentation slides; the data scientists gain a more central role in Sales Medium and thus have the legitimacy to get more involved in the reorganization (DS11).	
DS11	Data scientists get involved in the reorganization of Sales Medium and take over the task of identifying sales opportunities.	Stabilize the knowing practices	MG2, MG3	This indicates that the knowing practices are now radically changed, and that the data scientists have expanded their authority over sales tasks.	

Notes. Action labels starting with DS indicate actions performed by the data scientists. Action labels starting with AM indicate actions performed by the account managers. Action labels starting with MG indicate actions performed by higher management.

It is, however, important to analyze how these interventions came about and how the actions of the data scientists and account managers led to such managerial interventions (see Table 5 for a summary of the actions and their impact).

As can be seen in Table 6, the number of leads registered with the CLM code by the account managers in the CRM system continued to increase. In January 2013, after a year of collecting these data, the data scientists presented the registration data to higher management to show that the CLM model was effective. This was an important step for them, as they knew that once higher management started supporting the model, the account managers would have to

comply and work with it fully. However, the data scientists were selective in the data they presented to higher management. Similar to the benchmarking of the registration numbers at the kickoff presentations, they avoided comparing the leads registered with the CLM code to other sales metrics. Thus, this was an act of symbolic advocacy by the data scientists, meant to increase their authority. As illustrated by the following quote from the head of sales, higher management was persuaded and began to support the data scientists to further integrate data analytics into sales:

> We need analytics far more than we use it right now.... All that data and all the analytics makes the life of a sales

Table 6. Number of Leads Registered with the CLM Code in the CRM System

Sales team	Q1 2012	Q2 2012	Q3 2012	Q4 2012	Q1 2013	Q2 2013	Q3 2013	Q4 2013
Healthcare	3	0	176	46	No benchmarking among sales teams.			
East 1	9	24	122	56	Only the total number of leads was			
East 2	0	28	95	116	tracked and presented at the kickoff			
East 3	4	7	111	30	meetings.			
West 1	4	0	269	63				
West 2	0	0	167	69				
West 3	0	100	106	148				
South 1 (Kate)	286	637	1,455	1,396				
South 2	6	22	393	127				
South 3	9	5	1,085	360				
Total	321	823	3,979	2,411	13,180	11,418	24,306	15,955

person easier, so they can be more effective. And the company will not just have to assume that the sales person is doing their work properly. We'll know it. So I think there's a great benefit to putting far more energy on analytics than we do right now. (Head of sales)

From this point, higher management announced that all account managers had to work with the CLM model. This increased the pressure on the account managers, because the sales team managers had to commit their teams to actively use the CLM model.

> The Director of Marketing and Sales said, 'we must make that a way of working . . . I want every sales team to work with it, and do the right registration.' Then I organized all the sales team managers. We had a big meeting, they came to it, and we explained it. And they gave their commitment . . . We saw the progress of using the model as a standard way of working, but also the right registration in CRM . . . In the reviews, the sales team manager would talk about CLM with his account managers. (Mike, campaign manager)

Thus, symbolic advocacy by the data scientists, performed to gain the support of higher management by presenting them with the registration data, had a great impact on the regime of knowing: The data scientists gained more authority over the sales work and were able to put more pressure on the sales teams. Using their gained authority, the data scientists were also able to have an impact on the valuation scheme in Sales Medium: The CLM model became established as the legitimate way of working in Sales Medium. The data scientists also started pushing for the CLM model to become a tool for the sales team managers to evaluate the performance of their account managers. Ultimately, the data scientists' symbolic advocacy action, originally intended to gain authority, also impacted the established knowing practices at Sales Medium, because the CLM model was included in the training of newly hired account managers.

These changes created a difficult environment for the account managers, as they experienced more pressure than ever to use the CLM model:

> At the beginning of 2013, a big rumble in the jungle. . . 'Why don't you use that? Can you tell me why?' And not only to me, but also to my other colleagues . . . You can chat with your sales team manager, but he has another way of thinking . . . He had to make people quiet, and he said, 'I can get to my people; they have to fill that code in and I get no more questions.' (Account manager)

The account managers realized that registering leads with the CLM code symbolically had worked against them. However, because they found it difficult to embrace the use of analytics in their work, they registered leads with the CLM code even more than before, in order to appear compliant with the changes and maintain their knowing practices:

> For every sales opportunity we had to put the CLM code in there . . . People did not use CLM, but put the code in . . . Excel management from the management. At headquarters they don't want to hear that, in Region East, nobody uses the CLM . . . It's political. Somebody took a lot of time to make the CLM model. Yeah, that's a lot of money. *[chuckles]* Then you have to show that it works. . . . (Account manager)

Thus, by gaining management support with their symbolic advocacy action, the data scientists triggered the account managers to resort to further symbolic conformity. As can be seen in Table 6, over 2013, the numbers of leads registered with the CLM code increased exponentially, making the CLM model appear as if it was both widely used and effective. The data scientists celebrated the increase in registration numbers as a success but stopped benchmarking the sales teams, as all teams now registered leads with the CLM code. They did, however, continue to present their success to higher management, as indicated in the following excerpt from our fieldnotes:

> She also showed me a slide she has specifically about the CLM model. She said that she and Claire used such a slide every month to show to management and to higher management that the model is really working. On the top right there was a graph showing the number of leads and value of leads that have been registered in the funnel with the CLM code, for each month of 2013. It was an increasing line, which she said proved that the model had been used a lot. She told me that they couldn't track which of the leads were transferred into orders. (Observation of data analyst preparing a presentation for higher management)

Once the data scientists became more influential in sales work, after gaining the support of higher management, they used their newly gained authority to suggest more changes in the organizational structure and processes of the sales department. Based on their data analyses, the head of customer intelligence advised higher management "how customers could be served more effectively and efficiently."

In February 2014, higher management announced a major reorganization in Sales Medium, which rendered the account managers redundant as of the end of 2014 and entailed outsourcing contact with customers to external sales organizations. Although this decision was driven by the need to reduce costs, as TelCo was facing problems in the rapidly changing telecoms industry, this reorganization announcement by higher management also had a symbolic dimension: Because the CLM model was now regarded as an effective way of working (a result of the symbolic conformity actions by the account managers and the symbolic advocacy actions by the data scientists), higher management framed the reorganization of Sales Medium as a shift by TelCo toward becoming

more data-driven and efficient. This act of symbolic advocacy could be observed through the slides presented by higher management that gave the message that TelCo was increasing efficiency with the use of IT. This action was even perceived as symbolic by the head of customer intelligence, as he explained in the following quote:

> In February we had this meeting, and there was this presentation by the Director of Marketing and Sales. And most of the slides contained 'CLM model,' 'CLM way of working,' because he saw it as 'the way'... He told us, 'This is the way we are doing it, and this is going to make it all more efficient and effective'. But for them, and I'm very honest, it's like something they can hook these things on. If they say 'CLM model,' people believe it. But still, it's just a strategic step in reducing costs and more IT oriented... it's not all because of this CLM way of working. (Head of customer intelligence)

The layoffs and outsourcing plans of the reorganization had a significant impact on the regime of knowing at Sales Medium. Acting efficiently based on data analytics became established as the appropriate way of working in sales, which changed the valuation scheme from valuing information gained from close interaction with customers to valuing information based on rational calculations. This change in the valuation scheme also enabled the data scientists to gain more authority and acquire a more central role in Sales Medium, because they played an active role in the reorganization process at TelCo's Sales Medium, such as the reallocation of customers to new sales channels. The data scientists were also placed in charge of the task of identifying sales opportunities (with the CLM model) that would then be processed by agents in external sales organizations:

> But we also sort of do part of the work that the account manager used to do, because now we have to brainstorm which customers should be approached for which portfolio, which customers should be selected for the call centers. . . . (Data scientist)

One account manager reflected on the radical changes in Sales Medium:

> The account managers are highly trained or have a lot of experience, so they're not like a random street guy you could just put on the phone and just call, yeah? So, to me, it seemed like they said, 'OK, we're just going to get random street guys, and they're going to make phone calls based upon the CLM model, and because the CLM model has already proved itself, it's going to be very successful!' (Account manager)

In sum, in this period, the data scientists acted symbolically to gain managerial support and establish their authority in Sales Medium, enabled by the symbolic conformity of the account managers. This third period in which these reinforcing cycles of symbolic actions occurred (see also Table 5) resulted in establishing the CLM model as the legitimate way of working, thereby increasing the pressure on the account managers, who had to register their use of the CLM model symbolically in order to defend their knowing practices while appearing compliant. Establishing the CLM model as an effective way of doing sales further supported higher management in framing a major reorganization, based on the valuation scheme of efficiency reflected in the CLM model. Through this reorganization, the account managers were no longer needed, and the data scientists established their authority in Sales Medium and radically changed the knowing practices. Clearly, the regime of knowing in Sales Medium had become fundamentally different from how it was before the introduction of the CLM model.

Discussion

In this field study of the sales function at TelCo, we documented a radical change in the sales regime of knowing from one focused on a deep understanding of customers via personal contacts and strong relationships to one based on model predictions from the processing of large population-wide and historical data sets. The introduction of data analytics was followed by a struggle over the regime of knowing between the data scientists and the account managers. The account managers found the predictive model to be incommensurate with their knowing practices and in contradiction with the established valuation schemes and authority arrangements. They resorted to symbolic conformity, for instance, by designating personally generated sales leads as coming from the analytics model. In turn, the data scientists resorted to symbolic advocacy; for example, they presented the increase in registered sales leads as evidence of the model's effectiveness. For management, this apparent success of the predictive model confirmed the superiority of the new way of working and led to the layoff of most of the account managers. We find that this dance of symbolic conformity and advocacy did, ironically, accelerate this radical change in the regime of knowing.

A Regime-of-Knowing Perspective on Technology-Related Organizational Change

As the bidirectional arrows show in the model in Figure 2, the three aspects of the regime of knowing (knowing practices, valuation schemes, and authority arrangements) are intertwined in such a way that change in one is coupled with a change in the other two. Our findings indicate that these dynamics of change in one aspect influencing change in other aspects recurred in each of the three periods, each time spurred on by cycles of symbolic actions, ultimately leading to change in the whole regime of

Figure 2. Change of a Regime of Knowing Through Symbolic Actions
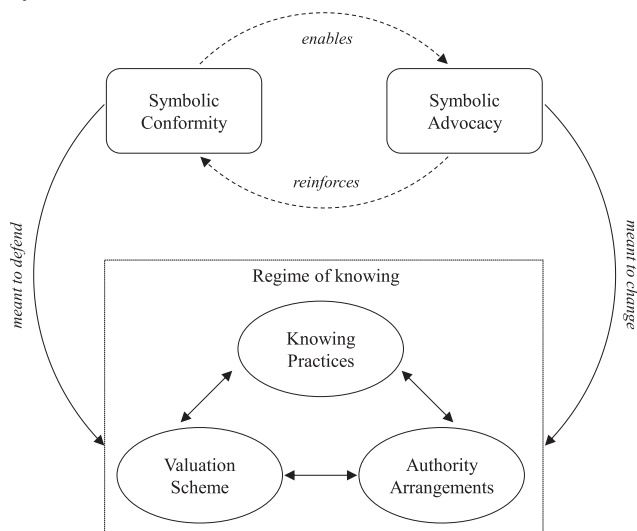
knowing. For example, in the TelCo case, before the introduction of the CLM model, the original knowing practices related to understanding customers through personal contact were coherent with the valuation scheme of forming deep relationships and with account managers having authority over how to approach their customers. Thus, changes in the valuation scheme and authority arrangements eventually led to contemporaneous changes in the knowing practices.

The interconnection between the aspects of a regime of knowing is important and has implications for change. We found that the incumbent workers whose work was affected by the technological change (i.e., the account managers) performed symbolic conformity in order to defend their knowing practices and to avoid real change. However, symbolic conformity enabled the technologists who introduced the new technology (i.e., the data scientists) to perform symbolic advocacy. The technologists performed symbolic advocacy with the intention to change all aspects of the regime of knowing. They targeted the valuation scheme throughout all three time periods; the knowing practices in particular during the second period; and the authority arrangements during the last period. Thus, whereas the incumbent workers only defended their knowing practices, the technologists addressed all three aspects of the regime of knowing. Moreover, symbolic advocacy to target one aspect of the regime, had ripple effects and resulted in changing the other two aspects as well (because all three are intertwined). Thus, by triggering symbolic advocacy, symbolic conformity aimed to maintain the knowing practices inadvertently contributed to changing the valuation scheme and the authority arrangements, and through those aspects, ultimately also changing the knowing practices.

Because actors tend to act within a regime of knowing unreflectively, they are usually unaware of how the aspects of the regime are intertwined. In fact, when actors focus on only one aspect of the regime of knowing, they may overlook changes taking place in other aspects, which could lead to unexpected consequences. For example, in our case, the account managers conformed symbolically to defend their knowing practices, focusing on resolving the practical challenges posed to them with the introduction of the data analytics technology. They were so engaged in the established regime that they could not conceive that the new approach could ever turn out to be a superior way of working. Thus, they overlooked the more fundamental and deeper challenges related to the valuation scheme and the authority arrangements. They enacted symbolic conformity to sustain their knowing practices, without realizing that, in this way, they had opened the door for the data scientists' symbolic advocacy tactics, which focused on all three aspects of the regime of knowing. By using symbolic advocacy, the data scientists managed to increase the value of the CLM model within TelCo and gain support from management. This eventually granted them authority, enabling them to push for fundamental changes in the knowing practices, and thereby radically transforming the regime of knowing.

Taking a regime-of-knowing lens illuminates why and how actors may resort to symbolic actions during technology introduction. Our findings suggest that symbolic conformity was a way for the incumbent workers who were affected by the technological change (i.e., the account managers) to sustain their knowing practices because they did not have sufficient power to resist implementation efforts by the technologists who introduced the new technology. Technologists may engage in symbolic advocacy in order to gain legitimacy and support from management and other stakeholders. In our case, symbolic advocacy involved promoting the effectiveness gains associated with the model-based ways of working. These actions were performed behind the scenes or indirectly to management. When both incumbent workers and technologists resorted to symbolic action, their distinct sets of symbolic actions reinforced each other and thus ironically became an important mechanism for accelerating the evolution of the regime of knowing. This was illustrated in the recursive relationship between symbolic advocacy and conformity in Figure 2. Both types of symbolic actions had a material component: what data were entered, how they were processed, and how they were deployed became areas of symbolic struggle. Thus, symbolic conformity, enacted through the apparently innocuous move by account managers of "ticking the box" when registering leads in the CRM system, ultimately had dire consequences. The data

scientists used the entered data to "objectively" demonstrate the success of the CLM model to stakeholders and therefore affected the valuation scheme and authority arrangements. This resulted in increased pressure on the account managers to conform. These reinforcing cycles of symbolic conformity and symbolic advocacy affected aspects of the regime of knowing in unintended ways and with ironic consequences.

Like in all qualitative studies, certain boundary conditions influenced the occurrence of these dynamics and may limit their generalizability. First, neither the account managers nor the data scientists had deciding authority over the Sales Medium function and thus could not impose their version of the regime of knowing. The lack of managerial intervention in the initial stages of the introduction of the CLM technology was also an important factor that triggered the struggle over the regime of knowing. If management had been involved from the start, the actors might have tried to engage with each other more substantively, rather than merely acting symbolically, and the regime of knowing might have evolved differently. Another boundary condition is the complexity and scale of the sale. In the TelCo case, the account managers who served large-sized enterprises were able to decline the introduction of the model because their deep engagement with their customers was economically crucial and too consequential to unsettle. Finally, the process of integrating the technologists into the sales function may have been highly consequential for the dynamics that emerged. If the data scientists had been collocated or paired with members of the sales teams, they may have engaged more genuinely with the account managers. Instead, they were allowed to remain separate, and this led to the polarization of differences.

Theoretical Implications

The regime-of-knowing lens that this study advances offers a new way to approach and understand the introduction of new technology in the workplace. Literature has shown that technology introduction can be highly problematic when it is associated with novel and unfamiliar practices that challenge how actors construct and use knowledge (Barley 1986, Zuboff 1988, Bailey et al. 2012, Barrett et al. 2012). The regime-of-knowing perspective views knowing practices as entwined with valuation schemes and authority arrangements. This helps researchers see below the surface of struggles over changing established practices and understand the deeper challenges that actors are faced with, such as disputing what is worth knowing, what actions matter to acquire this knowledge, and who has the authority to make decisions around those issues.

The regime-of-knowing perspective is useful to better understand the power dynamics around the integration of novel knowing practices with the introduction of technology. Incorporating new ways of knowing brings new power asymmetries by challenging who knows, who decides who knows, and who decides who decides (Zuboff 2019). The relative authority of actors is often a decisive factor in determining the outcomes of such power struggles (Markus 1983, Noble 1984, Barley 1990, Anthony 2018). However, the dynamics and outcomes of such conflicts are difficult to predict if none of the actors involved have full authority over the work domain. In those cases, the actors draw on aspects of the regime of knowing to affect the power struggle. For example, in our case, the technologists (i.e., the data scientists) tried to act on the valuation scheme in order to trigger management to take a stance, eventually having an impact on the authority arrangements and enforcing changes in the knowing practices.

When studying organizational or work changes that come about with the introduction of a new technology, the regime-of-knowing perspective can be an alternative to technological deterministic explanations. This perspective acknowledges that technology introduction can be associated with new ways of engaging with the world and novel approaches to the production of knowledge (Galison 1997, Knorr-Cetina 1999, Zuboff 2019). Yet, changes in knowing practices are not just tied to a new technology as if that were an external deterministic force, nor do they result from a planned implementation program. Instead, they are shaped by how the actors engage in the emerging struggles (Noble 1984, Kraemer et al. 1987, Zuboff 1988, Bailey and Leonardi 2015). Using a regime-of-knowing lens deepens our understanding of how such struggles unfold. Our study reveals that contests over the transformation of existing knowing practices can unfold behind the scenes through a series of symbolic actions.

Advancing a regime-of-knowing lens has also helped us understand why changes in knowing practices may emerge as unintended outcomes of those symbolic actions. Actors may resort to symbolic conformity to deal with the inconsistencies between a newly introduced technology and work practices (Azad and King 2008, Berente and Yoo 2012, Berente et al. 2016, Christin 2017). Or actors may engage in symbolic advocacy to gain legitimacy and support over the suggested changes from internal and external stakeholders (Brown 1994, 1995). Such symbolic actions are highly consequential, especially because of their reinforcing dynamics. As actors tend to operate within a regime of knowing almost unreflectively, they may act symbolically by focusing on one aspect of the regime, without realizing that this could enable or reinforce symbolic actions oriented to the other two aspects. Thus, whereas symbolic actions are generally viewed as a safety valve to maintain actors' idiosyncratic ways of

working (Oliver 1991, Hallett 2010), our study offers a different view according to which symbolic actions may work against the actors' intentions and yield dramatic consequences that extend beyond their control. For example, symbolic conformity may result in various ironic outcomes, such as damaging the very same actors who conform symbolically, or even luring management to perform radical changes without any real evidence that the new knowing practices are more effective than the old ones.

This study also contributes to the emergent literature on regimes of knowing by showing how transformation of a regime of knowing takes place. Regimes of knowledge have been demonstrated to be a useful framework to make sense of clashes over pragmatic differences (Howard-Grenville and Carlile 2006). When encountering radical work changes, actors draw on well-established conventions regarding what are good ways of acting to establish the legitimacy of their claims (Thévenot 2001, Patriotta et al. 2011, Cloutier and Langley 2013). Shifting the attention to knowing and to a processual, dynamic view of regimes has proven useful to explain how radical change in ways of working takes place and how the interactions of the actors involved affect this change process.

Finally, the emergence of new algorithmic technologies, such as data analytics, deep learning, and robotics that are increasingly permeating almost every process in nearly every type of organizational setting, is making the regime-of-knowing lens more necessary than ever. Such technologies generate insight, classifications, or predictions that resemble those of a knowledge worker (Faraj et al. 2018). They are associated with paradigms that challenge what counts as valuable information and how it is produced (Boyd and Crawford 2012). They impose deep changes on existing organizational members' ways of working that may be difficult to embrace (Anthony 2018). Thus, technologies can pose an existential threat to the knowledge workforce and implicate radical changes in forms of organizing (Zuboff 2019). The regime-of-knowing lens helps shed light on the deeper challenges arising from the emergence of algorithmic technologies, related not only with how we know, but also with which ways of knowing are more valuable and who determines that. Thus, the regime-of-knowing perspective can be a useful tool in the quest for answering research questions related to how such emerging technologies influence attitudes and behaviors in the workplace, how they affect power structures, and how they become associated with altered work content and processes.

Conclusions

Triggered by observations of ironic consequences of symbolic conformity during the introduction of new technology, we used a regime-of-knowing lens to explain how struggles unfold when actors are faced with changes in the established ways of working. We found that knowing practices are highly intertwined with deeper assumptions about which way of knowing is superior or who has authority to make decisions about how knowledge should be obtained. Thus, a regime-of-knowing lens facilitates the study of the actions that take place below the surface of a struggle over incommensurate ways of knowing and helps explain how radical transformation of knowing practices may happen through the reinforcing dynamics of symbolic actions.

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