

SYSTEMS OF TRANSFIGURATION AND THE ADOPTION OF IT UNDER SURVEILLANCE

Completed Research Paper

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Abstract

Research on the adoption of information technology (IT) has shown that employees either comply with the implementation of a new information system or resist its implementation, improvising information systems artifacts to replace it. We use a 15-month ethnography of the implementation of Siebel in a desk sales unit to outline a third specification of adoption where employees scaffold their work in an improvised information system that they hide from their managers by using their company's information systems to create an electronic façade of compliance. This façade is a labor-intensive process, complex enough to require a third information system of its own. We call this system "transfiguration system" and expose and explain a hitherto unexplored link between the information systems improvised by employees and the information systems that their company implements. We refer to the work required to create and maintain this link as transfiguration work.

Keywords: IT adoption, surveillance, system of transfiguration

Introduction

Research on technology-mediated surveillance suggests a dilemma for employees. On the one hand, when managers use information technology (IT) to monitor compliance with prescribed targets, they induce employees to improvise with information systems (Orlikowski 1996). Research on IT implementation has shown that companies can choose information systems to support the work of many different people doing many different jobs (e.g. McBride 1997). These multi-purpose information systems can be under-specified for the requirements of each individual job and may be at odds with the cognitive preferences of the people that are meant to adopt them (Doolin 2004). The gap between the IT that people need and the IT that people have pushes them to adapt prescribed technology, or to improvise around it for creating the information system that they need to achieve their prescribed targets (cf. Gasser 1986).

On the other hand, when managers use IT to monitor compliance with prescribed technologies, they induce employees to use information systems as their company intends (Ball and Wilson 2000). Research on computer-mediated surveillance shows that information systems provide managers with exhaustive and real-time data on their employees' uses of their prescribed technologies (Sewell 1998). Managers use these data to monitor the use of information systems and to discipline any adaptations to, or improvisations on prescribed uses of these technologies. They prevent employees from adapting, and improvising on prescribed information systems, hindering employees' attempts at complying with their company's targets (e.g. Bitner et al. 1967; Orlikowski 1991). Together, the two processes of surveillance create a dilemma where managers enforce both prescribed targets and prescribed information systems but employees cannot comply with ones without exposing their inability to comply with the others.

In the research reported in this paper, we outline a process to cope with this dilemma by addressing the following research question: *How does surveillance shape the adoption of information technology?* We explain how employees can address both challenges by transforming deviance from prescribed procedure into data that proves compliance with prescribed procedure.

We show that this *transfiguration work* requires a dedicated system of transfiguration to scaffold it. With the *transfiguration system* we expose and explaining a yet unexplored link between the IS that employees improvise for themselves and the IS that their company provides for them.

To do so we use Goffman's (1959) theory of interaction to integrate research on IT-mediated surveillance with research on the adoption of IT. We draw on an ethnography of a sales unit where a CRM system was implemented to explain how employees cope with the challenge that managerial supervision inflicts on IT adoption. We show that these conditions may induce employees to avoid scrutiny creating a an information system of their own to produce an electronic façade of compliance so credible that discourages leaders from exerting surveillance upon employees' work and their achievements.

The Challenge of Surveillance for IT Adoption

Surveillance affects IT adoption because it increases how much of what people do at work and their use of technology is visible and monitored by managers (Sewell and Wilkinson 1992). Surveillance can expose the practices that employees would rather hide from their managers to present an image of obedience (Ball and Wilson 2000).

Research distinguishes information technologies from other tools and machines which employees use to carry out their work because information technologies automatically broadcast and keep a permanent record of information about employees' work, whereas other tools do not (cf. Elmes et al. 2005). Managers can only monitor employees who work with lathes or mechanical typewriters by watching them perform their everyday tasks. However, managers can monitor employees who work with CNC machines or with electronic typewriters at any time they wish, without leaving their desk. IT is also different from other tools and machines that employees use at work because IT keeps permanent and continuous records about how it is used which are far more exhaustive and detailed than those which managers could obtain through direct observation. Mechanical typewriters keep no record of their user's work. Supervisors can monitor how much time each typist spends at their typewriter, how many jobs they complete and even how many pages they type through direct observation but electronic typewriters track periods of activity and inactivity, report typing statistics such as words-per-minute, and even record the actual text which

people type. These and other computerized tools and the software which they run can record and make visible the minutiae of employees work (Zuboff 1988).

Research shows that managerial supervision enacts this informing property of IT by using the data that information systems produce to monitor and to enforce compliance with the use of information systems and the policies and procedures encoded therein by measuring and monitoring a far broader and more detailed set of behaviors and outcomes than those that they would in the absence of information technology because of the increased amount of detailed data about employees' practices and performance that information technology makes visible (Orlikowski 1991).

From the point of view of employees, requested to comply with supervised use of IT and to contribute to measured business results, IT mediated supervision becomes not only a nuisance but also a threat. This happens in those cases where the prescribed use of IT is not sufficient to achieve business results but managerial supervision is not flexible enough to provide the slack to employees to augment IT with their own improvised IT (cf. Gasser 1986). IT adoption becomes then a process of striking the right balance between what is visible, monitored, collected by management and what is and should remain "off the radar," invisible and unseen by those in charge of enforcing compliance with prescribed procedure. In Goffman's dramaturgical model, achieving this balance is about creating front regions where performance is visible and back regions where preparation work can be carried out undisturbed (Goffman 1959).

Goffman (1959, 1971) defines interactions as a process where a person attempts to control the impressions that other people have of her by showing actions and achievements that are consistent with the image that she wants to present and by hiding those which are not. The challenge that managerial surveillance imposes on IT adoption can be specified as an instance of Goffman's model of interaction where employees and managers decide the extent to which work is carried out in front regions and which is carried in back regions. Employees seek to present an image of obedience by allowing information systems to record evidence of compliance and by preventing information systems from recording evidence of deviance.

Supervision through IT and the interaction between front and back region

Goffman argues that the chief tactic that people use to control the impression that others have of them is by separating their action between front regions and back regions:

When one's activity occurs in the presence of other persons, some aspects of the activity are expressively accentuated and other aspects, which might discredit the fostered impression, are suppressed. [...] Accentuated facts make their appearance in [...] a front region; [...] there [is] another region — a "back region" where the suppressed facts make an appearance. (Goffman 1959, 111-112)

Applying Goffman's model to IT adoption would suggest that when managers use IT to encroach on employees' practices, they prevent them from keeping a back region where they can improvise with IT.

Back regions hide two types of actions (cf Goffman 1959). There are actions performed in back regions that are unrelated to people's performances in front regions but which would discredit the image that people present therein, much like when a Broadway actor belches while having dinner on his own at home after a play. However, Goffman emphasizes that there are also actions performed in back regions that are necessary for people's performances in front regions but which would nevertheless discredit the image that people present there. These actions link back regions to front regions by arguing that the impressions conveyed in front regions need to be produced at least partially in a back region, much like a Broadway actor can only give a good performance in a front stage after rehearsing it in a back stage.

The mutual dependency of what is done in front and back regions affects how IT is appropriated in everyday work. As for any action performed in the back regions, IT adoption can be functional or dysfunctional to an organization's prescribed goals and procedures. This materializes in uses of IT that go from harmless compliance, to purposeful workaround, to pernicious resistance (Ferneley and Sobreperez 2006; Lapointe and Rivard 2005). Research has shown that people can improvise with and around prescribed technology to support their attempts at dysfunctional deviance or resistance (Beaudry and Pinsonneault 2005). These studies show how employees can appropriate IT to support their attempts at shirking and to support their attempts at obtaining unprescribed rewards (cf. Anteby 2008; Zuboff 1998).

These are improvisations with and around technology support practices that do not contribute, and may even hinder the achievement of employees' prescribed goals.

However, research on the adoption of IT has also shown that employees may need to improvise with and around prescribed IT to support their attempts at complying with their prescribed goals (Orlikowski 1996). These studies show that prescribed information systems may not support all of the everyday challenges that people face at work and may even hinder employees' ability to address those challenges. Some studies explain how managers' specification and implementation of information systems cannot account for variations of situated conditions for action even when they are systematic because of limits in the flexibility of information technologies and because of the difficulty of observing and interpreting differences among the situated conditions for action that each employee faces (Marakas and Hornik 1996). These studies also expose the effect of individual preferences that make different employees use different IS and IT artifacts to support their everyday work (see chapters in Heath and Luff 2000).

Specified thus, managerial supervision imposes two conflicting goals upon employees by forcing them to comply with prescribed goals in electronic front regions without allowing them to keep the back region that they need to hide the improvisations that are necessary to present that image of compliance but which hinder that image if they are seen by their managers. Research suggests that employees cope with this contradictory effect of surveillance on IT adoption by negotiating a back region with their managers.

Negotiated order and its challenges under supervision

Research on IT adoption has shown that employees are able to establish a negotiated order with their managers whereby managers only use information systems to monitor compliance with prescribed goals, but not with prescribed uses of IS and the procedures encoded therein (e.g. Azad and King 2008). A negotiated order is defined as:

[...] the sum total of the organization's rules and policies, along with whatever agreements, understandings, pacts, contracts, and other working arrangements currently obtained (Strauss 1993: 249).

Research on IT workarounds has shown that employees can establish 'pacts, contracts and other working arrangements' with their managers to weaken the level of computer mediated surveillance to which they are subjected. This type of negotiated order can be called negotiated invisibility because employees are able to retain enough of a back region to deviate from prescribed procedure and improvising with prescribed technologies as much as necessary to comply with prescribed goals under their own situated conditions for action and even to obtain some of the illegitimate rewards that motivate them to do so (eg. Doolin 2004).

Some studies argue that managers accept such a negotiated order because managers are sensitive to the pressures that employees face to comply with prescribed uses of IT and the prescribed procedures encoded therein (cf. Bitner and Garfinkel 1967; Fenerley and Sobreperez 1996). Other studies show that managers accept such a negotiated order because they can profit from employee deviance (cf. Anteby 2008). When managers do so, they collude with employees' attempts at profiting for deviance for their own sake rather than doing so to prevent their company from being harmed by the gap between the procedures that information systems prescribe and the procedures that employees need to enact to cope with the situated challenges that they face everyday at work. These studies however also underestimate the difficulty that managers face when they agree to exempt their employees from complying with prescribed information systems and with the prescribed procedures encoded therein.

Boland (1993) showed that leaders can use performance records to form impressions of their managers in order to support them in their career (see also Jackall 1989; Kling and Iacono 1984). Even managers have their managers to please. Vieira da Cunha (2013) shows that when leaders use information systems thus, managers cannot exempt employees from complying with prescribed procedures about IT without jeopardizing the image that they are able to present to their leaders and hindering their career prospects. In such conditions, managers are not susceptible to employees' pleas for exemptions in the use of prescribed information systems and employees need to find alternative ways to cope with the conflicting demands created by the increase in the number of activities that managers monitor and the decrease in the space to prepare and to support that image.

Next, we explain how employees deal with IT adoption in such conditions by drawing on ethnographic data from the use of information technology in a sales unit. We show that employees are able to improvise with and around information systems without being allowed the necessary back regions, by hiding their improvisations behind an electronic facade of compliance. Thus doing, they enact a dramaturgical rather than a functional process of IT adoption.

Methods

The data that we use to build a model of IT adoption under surveillance were collected during 15 months of participant observation at DeskSales (all names are pseudonyms).

DeskSales is a desk sales unit that Mega Telecom (or M-Tel, for short), a global telecommunications company, created to complement M-Tel's field salesforce. Desk salespeople were hired to sell simple, low margin products such as ADSL connections. Desk salespeople were recent high-school graduates with little if any work experience. Field salespeople kept the complex, high margin products such as call centers and corporate network infrastructures. They were middle-aged engineers with 10 to 15 years of experience. DeskSales was set up and monitored by a steering committee constituted by managers from different parts of M-Tel.

M-Tel implemented Siebel, one of the leading CRM systems, to help desk salespeople and field salespeople do their job and to monitor their compliance with prescribed sales targets and prescribed sales procedures. Siebel is an IS that supports sales work. It stores and provides information about customer contacts, salespeople's activities, sales opportunities and closed sales. Siebel is also a management tool. It allows managers to scrutinize and supervise their salespeople's sales and saleswork. M-Tel's top management team used Siebel to monitor, manage and measure the work of the company's sales units. General managers of M-Tel's sales units relied on Siebel to forecast sales, to assess their unit's progress towards its target and to reward or discipline salespeople. Siebel data were used to calculate the bonuses of salespeople and their managers and to decide on promotions and account assignments.

Our research focused on documenting desk salespeople's adoption of Siebel and their improvisation of information systems around it. Desk salespeople's use of these information systems was documented through a 15-month, full time participant observation. Data collection procedures consisted of shadowing each and all of the desk salespeople in the unit during a whole workday and collecting all their incoming and outgoing communication (electronic mails, telephone calls and forms) and documenting all artifacts they used to work. Several salespeople were shadows during several consecutive days to have a sense of the ebb and flow of their work and their use of IT. These observations were collected in fieldnotes which included notes of what desk salespeople did during the day, notes their use of Siebel and the material artifacts that salespeople improvised around it, notes of salespeople's account of their practice and the artifacts encoded therein, verbatim quotes from conversations and meetings, phone calls and email messages. There were about 1200 single-spaced pages of fieldnotes from about 300 days of observation.

The artifacts implicated in desk salespeople's work practices were collected through two processes. One consisted of taking pictures of each desk salesperson at work using the set of artifacts that scaffolded their everyday practices. The other consisted of taking individual pictures of each of these artifacts to document their individual role in desk salespeople's work. These observations were supplemented by 55, one-hour interviews with Desk Salespeople, sales managers, senior sales managers, the unit's general manager, field salespeople, and the unit's training staff. These interviews included questions about the artifacts that each desk salesperson used and their reaction to Siebel.

Data analysis followed three steps. The first step consisted of specifying the IT-mediated supervision to which desk salespeople were subjected. To do so, we culled from fieldnotes verbatim quotes that documented interactions between managers and employees. These included formal and informal meetings with sales teams and individual salespeople. We sorted the quotes in three groups that represent different ways in which managers used technology to mediate their relationship with salespeople.

The second step consisted of specifying how supervision affected how desk salespeople appropriated IT. To do so, we began by specifying how employees interpreted managers' IT-mediated supervision. We read all of the interviews with sales people through all their accounts of their work practice in fieldnotes to find their interpretations of managers' practices. We found that although salespeople complied with

managers attempts to enforce service work, a few did so reluctantly but many described their service work as valuable for their customers and their company.

We then specified the practices that employees enacted in response to these interpretations and the artifacts that employees used to scaffold these practices. Our goal was to analyze practices and artifacts together and thus be able to specify the effect of managerial supervision on whatever information systems employees improvise for themselves in addition to its impact on employees' use of their company's information systems (cf. Orlikowski and Scott 2008). We divided salespeople's practices and the IT artifacts that supported them based on an emic classification that salespeople used to discuss their work in interviews which distinguished 'real work' (service work) from 'admin work' (reporting orders as sales in Siebel).

The third step consisted of specifying the functionalities of the information system which consisted of these artifacts. To do so, we grouped material artifacts according to the functionality that salespeople attributed to them. We found three groups of material artifacts with three different functionalities. There were artifacts that were used to present records of sales to managers, there were artifacts to do service work and there were artifacts to transform service work into records of sales.

The fourth step consisted of integrating these functionalities into a model of people's adoption of IT under managerial supervision.

The adoption of Siebel under conditions of surveillance

The implementation of Siebel by DeskSales's managers

DeskSales' general manager Mariah and her sales managers used Siebel to monitor salespeople's compliance with their targets for sales and for calls to customers and with prescribed uses of Siebel. However, salespeople did not report enough calls or sales in Siebel to reach any of their targets in the first few months after DeskSales was launched. After the unit's first quarter, salespeople's sales were on average 15% behind their running target with one team lagging as much as 18% behind target. Managers enacted three practices to improve the sales and salescalls that salespeople reported in Siebel

First, they taught their salespeople how to report customer orders as sales. They showed sales people to find the orders that customers placed to service units in the information system that M-Tel used to invoice customers but sales manager Nathan warned his salespeople that "the best way to get revenue is to get customers to call you when they need to buy something." Other sales managers issued similar warnings. They told their salespeople that, "you need to make sure that you have a real relationship with them [ie. customers]," and that "they need to think of you when they think about [M-Tel]." They argued that "you need to take responsibility for managing that relationship [with customers]," so that "they trust you" and "learn to rely on you." Sales manager Jack, like other sales managers at DeskSales told his salespeople to become "your customers' main point of contact" when customers wanted to submit service requests, "you don't have to do it forever, but if you do it right you can get some orders thrown in with their [ie. customers'] faults and queries." He added that if desk salespeople did service work, "you'll boost your call stats [ie. records of calls to customers in Siebel] because you'll be in regular contact with your accounts."

Second, managers admonished and threatened salespeople that had failed to report enough sales or customer calls in Siebel. In his team meeting of October 3rd., sales manager Josh wrote to his team after reading a report that showed that no one had recorded enough calls to meet their weekly target:

Who wants to leave first this is a disgrace, what the heck do you guys do. Is this why we are also behind target? Need to get real or I will move people out of the team read duties and rights. The next report will decide my actions!

Third, managers emphasized the peril and the promise of visibility that Siebel offered to induce salespeople to report customer purchases as the outcome of their own saleswork and to report enough calls to customers to meet their weekly targets. In his team meeting of November 2nd, 2002, Roy emphasized the benefits of achieving their targets. Roy warned his salespeople that "there is going to be more and more focus on Siebel." Roy began by telling his sales people that the number of calls to customer that they reported in Siebel was "showing a positive trend." He told them to keep meeting this target, "I don't care how you do it." He added that "we have easy [sales] targets: the more money you

make, the more money I make,” he added: “that's what we're here for at the end of the day.” He added that there were other benefits from reporting enough sales in Siebel to reach their targets, “Todd is on the rising stars program” which meant a lot of face time with upper-level managers. “The opportunity is there for you”. He said that “if you want to do 9 to 5, that's great”, “I don't care either way.” Desk salespeople responded to these three practices by following their managers' instructions to report orders as sales.

Salespeople's adaptation of, and improvisations around Siebel for service work

Salespeople spent on average two thirds (68%) of their day doing service work in exchange for the opportunity to record customers' orders as sales and thus reach their monthly sales targets while showing that they were using Siebel to do so. They used a set of information systems that they improvised for themselves. Although a few salespeople disapproved of what Jeanne described as her managers' “permission to flog orders in Siebel,” that is to report the orders that customers had placed as if they were the outcome of salespeople's effort, many voiced a view similar to Raymond's, who argued that:

A lot of our job is service orientated which I think is a worthwhile job because I think we sometime go one step beyond the service team. [...] One of the good things about the DeskSales is that there's always somebody there for the customer to speak to, outside the service arena. And I think that as far as I'm concerned, I've built trust with my customer and that helps. And I think maybe we see more business because I've been there.

Simple service tasks

Desk salespeople's service work consisted of simple and complex tasks.

Simple service tasks included processing small orders and reporting faults. These tasks required sales people to remember a single product, error code, reference and, at the most, to perform simple calculations for service charges and installation dates.

Salespeople scaffolded their simple service tasks in three instances of an artifact that can be called a running log because it kept an ongoing record of the information that salespeople needed to remember to do this of service work. Some salespeople stored this information in a notebook or a calendar that they kept until all the pages had been used. There were salespeople that used a single page of paper that they threw away at the end of the day. There were a few desk salespeople who used a number of scraps of paper, such as leaflets and supermarket receipts that they trashed throughout the day as they ran out of space. Jeanne used her running log thus:

Jeanne received a call from a customer asking for a quote on a private circuit [...]. Jeanne asked for the phone numbers of the two ends and jotted down “555-4554 to 633-1234” in the back of a supermarket flyer that she had taken from her bag. She then called the private circuits service unit for help in pricing this request, reading the phone numbers from her note in the supermarket flyer. She was told a price and jotted it down on the supermarket flyer. She wrote an email message to her customer with the price, asking to confirm the purchase.

The next task in Jeanne's workday further illustrates the use of running logs:

A few minutes later, Jean received an email message with an order for 7 switches. The message included the telephone number of, and the number of lines connected to each switch. She looked down at the back of her supermarket flyer and complained, “I can't fit all of this here.” She discarded it and picked a blank post-it note where she jotted the phone number for each switch and its number of lines in a blank page of her notepad, arranged in a column: “555-1231 (7) 555-1232 (12) 555-1233 (4) 555-1234 (15) 555-1235 (13) 555-1236 (19).” She then entered all the data that she had jotted down in a spreadsheet that salespeople used to calculate prices. She pinned the post-it note to her computer screen and consulted it while writing an email message to the customer with a table that included the telephone number of each switch, the number of lines for each switch and the total price for the 7 switches. She explained, “if he wants to go ahead and order them, I'll have all the information I need here instead of having to dig for it.”

Jeanne's use of her running log shows that how salespeople incorporated this artifact in their service work. Salespeople used running logs to store information temporarily. They referred to the information in

their running logs shortly after recording it. Many discarded these artifacts as soon as there was no more space to write on them. The information that they recorded in running logs was not identified in any way or linked to any specific task. Salespeople relied on the flow of their work on each specific task to make this information intelligible.

Running logs scaffolded salespeople's simple service work while keeping it hidden from their managers because they replaced, rather than adapted or improved with Siebel with short-lived, context-dependent artifacts that managers could not easily access or understand.

Complex service tasks

Complex service tasks consisted of orders that required information on multiple products with a wide range of configurable parameters and fault reports for problems that were difficult to diagnose. These tasks required desk salespeople to remember detailed information about a variety of equipment and service requirements and to calculate complex pricing structures for a variety of service jobs. Salespeople scaffolded their complex service work on an artifact that they called a to-do pile because it kept a record of all the information necessary to complete each task in an annotated email message that customers had sent reporting a fault or placing an order. A few desk salespeople saved customers' email messages as text files that they annotated on their computer. Most desk salespeople printed these email messages and annotated them with pen or pencil. Jeremy used his to-do pile thus:

Jeremy picked up a pile of annotated printed emails from the top drawer of his desk, "this is my to-do pile." Jeremy received email from a customer asking for a quote for a complex private circuit that involved multiple points with different service charges. Jeremy spent few minutes reading that email and then said that instead of scrolling up and down, he was going to print the email so that "the products are easier to find." He put the printed email at the bottom of his to-do pile. He picked up the topmost printed email in the pile. It was an order for multiple ISDN lines connecting multiple customer sites. At the top of the right margin, there was a list with four tasks, "1) A and B numbers; 2) References; 3) Price; 4) Order form." Tasks 1) and 2) were crossed out, "right, now I need to figure out how much we're charging them." He did the calculations for ISDN prices next to the data for the ISDN lines on the printed email message. He called the ISDN service unit to make sure that he had calculated the price correctly and was advised about an ongoing discount for new ISDN lines. Jeremy crossed the price that he had calculated on the printed email message. He jotted the discounted price below it. Jeremy then sent an email with an order form for to the ISDN service unit. He discarded the printed email he had been using and complained, "one down, a whole pile to go"

Jeremy's use of this to-do pile illustrates two features of this artifact as a resource to scaffold desk salespeople's service work. First, salespeople used to-do piles to store and access at a glance the information about the progress of each service task, including information from email messages, phone conversations with service representatives and with the customer, and electronic communication systems. Second, to-do piles were a task-specific scaffold for all the tasks needed to complete each individual service request. Desk Salespeople used the printed email messages in their to-do pile to calculate service costs and to list all of the service jobs that had to be initiated for each customer request. However, each printed email message was only used to scaffold the activities pertaining to the task that it referred to.

To-do piles made the traces of salespeople's service work easier to decipher than the traces of their simple service tasks left in running logs. However, managers could only attempt to do so by going through the stack of printed email messages in salespeople's desk and, more often than not in their trash can. The material properties of to-do piles kept salespeople's complex service work as opaque and inaccessible as their simple service tasks.

Collaborative service tasks

Desk salespeople performed a small amount of their service work using Siebel. These were complex service requests that required desk salespeople and field salespeople to cooperate on pricing new or re-designed large-scale telecommunication infrastructures for their customers. These tasks required salespeople to remember and process information similar to that required by the complex service tasks that they could do on their own. However, they added the challenge of conveying to, and receiving from field salespeople a part of the information that was required to carry out these requests. Tom's efforts to

help a field salesperson set up a call center for one of his customers shows how many other desk salespeople adapted Siebel for this type of service work.

Tom received an email from field saleswoman Deborah asking him to place orders for all the equipment necessary to set up a new call center for Northcorp. Deborah wrote that: "I created a \$1000/10% opportunity in Siebel to keep all the paperwork, [...] you can find all the information you need there." She asked Tom to "put all the AROs [order forms] there, instead of sending them via email." Tom opened the opportunity that Deborah had created in Siebel and found a spreadsheet listing all the equipment that had to be ordered for Northcorp's call centre. He sent an electronic copy of the spreadsheet to the service unit that installed and repaired telecommunications equipment for call centers. He asked service representatives to "please confirm when each order is first billed" to the customer. Whenever Tom received a billing confirmation for Northcorp's call center, he updated the spreadsheet that Deborah had placed in Siebel.

Tom explained that, "1K [ie. One thousand-dollar], 10%, opportunities are never picked up [in management reports], you can keep everything there [...] it builds a picture on Siebel of everything that happened that nobody else can see."

Tom's use of Siebel to cooperate with field salespeople highlights two features of desk salespeople's use of this improvisation to scaffold complex tasks that required cooperation with field salespeople. First, desk and field salespeople used Siebel to collate all the information necessary to carry out their customer's request. This allowed desk salespeople to transpose to their cooperation with field salespeople their use of to-do piles to avoid the tedious and time-consuming task of searching through M-Tel's information systems and their own notes for information. However, instead of summarizing this information as notes in the margins of a printed email message, desk salespeople could use Siebel to keep entire electronic files with far more detailed information about their service tasks.

Second, desk and field salespeople used Siebel as a shared repository of information. Siebel allowed salespeople in both units to provide one another with all the resources that each of them needed to do their part in a service request. There was no work involved in sharing these files because each salesperson used Siebel to scaffold their own portion of the work for their customers' service requests.

These Siebel records made desk salespeople's work on complex, collaborative service tasks very visible. They kept all the information about this work in Siebel, making it readily accessible to sales managers. Moreover, this information had to be understandable to field salespeople, making it easier to interpret by sales managers. However, desk salespeople took advantage of sales managers' compliance with the prescribed procedure of only reporting sales opportunities above \$1000 and 10% probability of closure to make these Siebel records invisible to their sales managers.

Simple, complex and collaborative service tasks were only a part of their everyday work. Desk salespeople spent on average 21% of their day doing what many of them called "admin work." This entailed producing two sets representations of service work. One was intended to represent compliance with sales targets. The other was intended to represent compliance with targets for customer calls.

Salespeople's adaptation of, and improvisations around Siebel for representing service as sales

Transforming simple and complex orders into sales records entailed two tasks. One was to calculate the setup fee and the quarterly payment for the products that customers wanted to purchase. The other was to introduce this and all the other information necessary for a complete sales record into Siebel.

Setup fees and quarterly payments were easy to calculate for simple orders. They could be ascertained through a one-time search of M-Tel's electronic pricing manual. Desk salespeople used their running logs to jot down installation fees and the quarterly payments while reporting simple orders as sales in Siebel.

Setup fees and quarterly payments for complex orders were more difficult to calculate. Salespeople had to add the prices of all the products included in an order, deduce discounts according to a prescribed schedule that changed for each product, and accrue service fees based on individual service-level agreements with customers. Desk sales people used an artifact that can be called a disposable aid to scaffold the calculation of setup fees and quarterly payments for complex orders. The disposable aids of

most salespeople consisted of a blank sheet of paper or a scrap of paper where they made these calculations and discarded afterwards. Some desk salespeople used a Microsoft Excel spreadsheet that they deleted once they had established the setup fee and the schedule of quarterly payments for an individual order. Salespeople jotted both sets of numbers in the electronic or printed copy of customers' email messages in their to-do pile that they used to scaffold their work on each customer order. They looked for this information there when they recorded each order as a sale in Siebel. Mark explained:

I have to use paper because there's no way to do this in Siebel. It just throws this massive table at you and you're supposed to figure it all out [ie. calculate the revenue schedules] on your own. [...] MAX MERIDIANS [a programmable private telephone switch] are my bread and butter [ie. the product that Mark's customers order more frequently] and that's a 5-year contract: 20 quarters worth of revenue! [...] Maybe I'm really stupid, but I can't do that [ie. calculate a revenue schedule for 20 quarters] just using my brain.

Salespeople used four artifacts to collate and record payment schedules with all the other information about a purchase into Siebel's sales management module. Two artifacts were adaptations of those that desk salespeople used to scaffold their everyday service work. Salespeople transcribed this information to, and copied it from their running logs when recording simple orders as sales in Siebel. They used the annotated copies of customers' emails in their to-do piles when recording complex orders as sales in Siebel.

Salespeople used two other artifacts solely to scaffold the transformation of orders into sales records in Siebel. Some desk salespeople used an artifact that can be called an invoice list because it listed all the invoice references for the orders that salespeople processed throughout the day in a blank page in a notebook, a post-it note or a scrap of paper. They used M-Tel's order tracking system to find all the information they needed as they were reporting each order as a sale in Siebel. Most desk salespeople used another artifact called an order table. This was a MS Excel spreadsheet or a printed table that listed completed customers' orders in rows with separate columns to hold information about the customer, the product sold, the price and the other information necessary for a complete sales record in Siebel. Salespeople that used these two artifacts reported orders as sales in bulk. Saleswoman Jeanne explained:

I've been doing a lot of ISDN lately and I've been using this spreadsheet to keep all of my orders. Then, I only need to put them in Siebel in one go. Sometimes, I combine all of them into a single order. It's probably not as accurate as it should be, but it saves me a lot of work.

Taken together, the practices that salespeople enacted through these artifacts for transforming orders into sales in Siebel increased the difficulty of accessing and understanding salespeople's work and the role of Siebel in supporting it because they hid it behind a façade of compliance in Siebel. This façade not only hid customers' orders in the guise of sales, but also service calls in the guise of sales calls while pretending that Siebel was used to support sales instead of showing that it was little more than a tool to represent compliance with prescribed uses of IT and prescribed sales and saleswork targets.

Salespeople's adaptation of, and improvisations around Siebel for representing service calls as sales calls

Desk sales people used two different artifacts to scaffold the transformation of service calls into sales calls in Siebel's task module. A few desk salespeople improvised directly with Siebel. They recorded the calls that they made throughout the day shortly after hanging up while misrepresenting its subject and occasionally its target. They reported calls to customers addressing service issues as sales calls and they reported calls to service units as calls to customers. Terry reported two separate sales calls from his work on an ADSL installation. One call stood for the email message he sent to order the ADSL installation. The other stood for the email message that he forwarded to the customer with the date of the installation. Just before reporting these two calls in Siebel, he protested:

Now I have to log all of this crap [in Siebel] and I don't even need to keep a record of it! It actually makes me feel really frustrated and quite violent, Siebel. I'd say that on a day to day is my biggest cause of stress in the office. I spend most of my day dealing with bureaucracy, instead of being customer-facing.

Some salespeople created a generic sales call record in Siebel and copied it the number of times necessary to reach their target. Salesman David was admonished by his sales manager for not having recorded a

single customer call on Siebel for the whole week, David complained “I’m just going to copy all of them.” He confessed that, “I feel I’m abusing the system.” He entered a call in Siebel with the description “Spoke with customer RE: account” and copied it 34 times (the target is 7 calls a day so these are all his calls for the week), “before I used to write different descriptions on the calls and change the time on each one, but no one does it, so I simply copy and paste”.

There were other desk salespeople recorded their calls in an artifact that can be named a call list because it kept a record of the calls that salespeople made throughout the day. This list was kept on a sheet of paper or on a Microsoft Excel spreadsheet. Desk salespeople introduced these calls into Siebel’s task management module when their managers had them do so or when they could find some free time. John used Microsoft Excel spreadsheet with the headers, “date,” “time,” and “name.” He filled a row whenever he called or received a call from a customer, with the real name of the person he talked to. He also filled a row whenever he called, or received a call from a service representative with the name of the customer that had submitted the service request to which the call pertained. Just before leaving the office, John opened this spreadsheet on one half of his computer screen and Siebel’s task management module on the other half and copied the information in the one into individual sales records in the other.

The artifacts that scaffolded the transformation of service work into sales work in constituting a third information system. This network of artifacts mediated the relationship between the unprescribed information system that salespeople used to carry out the service work necessary to be able to claim credit of customers’ orders and the prescribed information system that they used to appropriate these orders to represent compliance with their sales and saleswork targets while pretending to comply with prescribed uses of Siebel, their prescribed information system.

The next section integrates these findings into a tripartite model of the adoption of IT and outlines a dramaturgical model of IT adoption that contrasts with the functional model of IT implicit in negotiated invisibility.

Systems of representation, documentation, and transfiguration

Our research at DeskSales shows how employees can use information systems as front regions and back regions to cope with surveillance by presenting compliance with prescribed goals and prescribed uses of IT without having to comply with either. They use three sets of information systems to do so. They use their company’s prescribed information system as an ostensive system of representation where they report compliance with prescribed targets and prescribed uses of information systems. They improvise a hidden system of documentation where they do their everyday work. They use a system of transfiguration to transform the records of their everyday work into evidence that they have achieved prescribed goals and have adopted information systems as their managers intend. We show that the practices that managers enact with information systems for monitoring people’s work, their achievements and their use of IT has a different but cumulative effect on each of these three systems that employees use to cope with surveillance during IT adoption.

Systems of representation

Salespeople’s use of Siebel to create a façade of compliance with their targets turned it into a system of representation: a prescribed information technology that employees use to present evidence of compliance even when they have not used prescribed IT, they have not followed prescribed procedures and they have not reached their prescribed targets.

Our research at DeskSales shows that employees can adapt the prescribed information systems that they resist, to produce records of compliance with procedures that they disobey, and with targets that they disregard. Thus doing, they keep their unprescribed work from managers’ scrutiny. This adoption of IT broadens the role of employees in the production of electronic representations of their work. Employees may do little more than leaving reluctant electronic traces of their practice as they use prescribed IT to scaffold their work (Ezzamel et al. 1998; Orlikowski 1991). However, we show that they may also attempt to shape the representation of their work in prescribed IT to suit their own interests.

Managers influence how employees use prescribed IT to provide evidence of compliance by specifying the depth of surveillance, that is the proportion of the data in the records of employees’ activities that they

monitor and report. Salespeople's attempts to create a representation of compliance in Siebel points towards three effects of the depth of surveillance upon the systems of representation that employees use to create records of prescribed work.

First, when managers decide how compliance with prescribed uses of IT and with prescribed targets is measured, they define the data that employees need to record in prescribed technologies to represent compliance. Thus doing, they specify the effort required to produce credible evidence of compliance with prescribed targets and prescribed information systems. At DeskSales, salespeople only needed to record the date and contact of their calls to customers if they wanted to represent compliance with saleswork targets and with the use of Siebel to support it. They knew that they were safe from exposure even if they did not enter any data in any of the other fields in each record of sales call because managers did not incorporate any of these fields in their reports. However, they had to enter data in 42 different fields in every sales record that they created if they wanted to report sales that counted towards their sales target and to show that they were complying with prescribed uses of Siebel.

Second, when managers define how compliance is monitored, they specify the amount of internally consistent performance data that each record requires. Thus doing, they define the difficulty of producing credible evidence of compliance in those fields of electronic records that managers use to monitor and evaluate employees. At DeskSales, providing evidence of compliance with targets for sales calls only entailed entering a data and a fictitious name in Siebel. Providing evidence of compliance with targets for sales was far more burdensome. It required doing enough service work to poach enough revenue from customers' orders to record in Siebel as the outcome of salespeople's own sales work. Providing evidence of compliance with Siebel required salespeople to report compliance with sales and customer calls.

Third, when managers of managers define how compliance is reported, they can also enforce specific tactics to produce records of conformity with prescribed information systems. Thus doing, they join and, in cases such as DeskSales, take over employees in producing evidence of compliance to ensure that their employees' resistance to prescribed IT and prescribed procedures does not jeopardize their own interests and incentives. At DeskSales, sales managers motivated, taught and disciplined their salespeople on reporting their customers orders as sales.

Desk salespeople's reactions to their managers' use of Siebel to monitor their sales, their sales work and the role of this information system therein emphasize that more surveillance does not entail more compliance. It does, however, entail more work to produce plausible representations of compliance with prescribed goals and prescribed technologies. Our research at DeskSales suggests that this work is supported by an improvised system of documentation.

Systems of documentation

The set of artifacts that salespeople used to support their service work is an instance of a system of documentation, that is a set of materials that people use to store, access and process information to do their everyday tasks. Research attributes these information systems to people's individual preferences and to the cognitive demands of their work (Heath et al. 2000; Orlikowski and Scott 2008; Suchman 1992).

Our research at DeskSales adds computer-mediated surveillance to the factors shaping systems of documentation. We show that when managers use IT for surveillance, they influence how employees incorporate prescribed IT into their everyday work and how employees supplement prescribed IT with information systems of their own.

Managers shape the systems of documentation that employees improvise by specifying the breadth of surveillance, that is the proportion of employees' work reported in their company's information systems. The effect of DeskSales' managers use of Siebel to monitor salespeople had on the information systems that salespeople improvised to do service work points toward four effects of the breadth of surveillance upon the systems of documentation that employees use to do their everyday work.

First, when managers decide the specific work practices and uses of IT that are monitored through information systems, they also define the work that IT does not monitor nor report, creating a back region that is invisible to prescribed information systems. This allows employees to enact unprescribed work practices that are not recorded in prescribed information systems and defines the boundaries that such practices must observe if they are to remain invisible. Specified thus, the breadth of surveillance

establishes the varieties of unprescribed work that systems of documentation can be improvised to support. At DeskSales, desk salespeople were able to carry out service work without leaving traces of this activity in Siebel, but they could not create fraudulent sales that were not supported by customers' orders without leaving traces that they had done so. This specified service work as the most viable alternative to represent compliance with their sales targets and defined the tasks that their unprescribed system of documentation needed to support.

Second, when managers decide the work that IT does monitor and report, they turn information systems into a front region where employees risk exposure. They add to the functional and situational factors pushing employees into improvising information systems of their own, instead of using their company's prescribed system for doing their everyday work without disclosing their deviation from prescribed procedures and without broadcasting their failure to meet prescribed targets. At DeskSales, these improvised systems consisted of a network of artifacts that salespeople used to store and process all the information necessary to do their service work without leaving electronic traces of it in Siebel.

Third, when managers decide on the work that IT monitors and supports, they shape the information systems that employees improvise by excluding from prescribed IT the functionalities that employees need for work but that managers do not need for surveillance. Thus doing, managers limit the functionality of prescribed information systems because these systems do not record and process enough information to be useful for supporting the activities that they are designed to monitor. At DeskSales, salespeople contrasted their need for a system that allowed them to find all the information related to each service task with the limited functionality that M-Tel chose for its implementation of this Siebel because managers only used it to count the number of daily customer contacts for each salesperson.

Fourth, when managers decide on the work that is monitored by prescribed IT, they can implement an information system that is only capable to monitor and support the employees' prescribed work and incapable to coordinate and support their unprescribed work. Salespeople described a mismatch between the information that they could access through Siebel sales and task management modules and the information that they needed to record and process in the course of their everyday service work because M-Tel's steering committee set up the unit to sell, not to help customers with their orders and fault reports. Salespeople had to improvise an information system of their own to scaffold these tasks.

Our research at DeskSales shows that the representation of compliance that employees produce in prescribed systems of representation is based on the records of their everyday work that they keep in unprescribed systems of documentation. The process of translating these data from one system to the other is supported by an information system of its own.

Systems of transfiguration

Transfiguration is defined as the change of form or appearance into another. A system of transfiguration is a set of artifacts that scaffolds the transformation of records of work in improvised information systems into records of compliance with prescribed uses of technology and prescribed targets in prescribed information systems.

Our research at DeskSales extends the effects of surveillance on employees' use of information technology to include the emergence of a system of transfiguration, a third information system that links the systems of documentation that people improvise with and around prescribed technology and the systems of representation that people enact with prescribed technology. It highlights the additional exertion and the extra cognitive burden imposed by the need to transform information in systems of documentation into records of conformity in systems of representation. It defines transfiguration work as a set of tasks that require independent effort and that are complex enough to be scaffolded an information system of their own. This transfiguration work, and the system of transfiguration that scaffolds it have yet to be specified by research on IT and organizations.

Our research at DeskSales points toward two functions of a system of transfiguration to support a process of IT adoption where employees use prescribed information systems to represent compliance and improvise unprescribed information systems to support their everyday work.

First, employees use their system of transfiguration to collect and arrange the traces of their work that they keep in their systems of documentation to be represented as evidence of their compliance in

prescribed IT. At DeskSales, salespeople recorded orders as sales by collating evidence from the network of artifacts that they used to scaffold their service work. They used two artifacts, invoice lists and order tables, to scaffold the transformation of the information that they kept to fulfill customers orders into the data that they reported on Siebel to present customers' orders as their own sales.

Second, employees use their system of transfiguration to produce and process information that they do not require for their everyday work but that they do require to produce records of compliance in prescribed IS. At DeskSales, most of this type of transfiguration work consisted of calculating setup fees and quarterly payments. Salespeople did not need this information to expedite customers' orders, but they needed it to report those orders as outcomes of their own saleswork. These data were difficult to produce and they required an information system of their own that included but extended beyond the artifacts that integrated the system of documentation that scaffolded salespeople's service work.

Managers shape systems of transfiguration by specifying the intricacy of surveillance, that is the complexity of the procedures for producing the data in prescribed IS. The transfiguration work that salespeople called their "admin work," and the information system that they improvised to scaffold it, point toward two effects of the intricacy of surveillance upon systems of transfiguration.

First, when managers specify the procedures to produce data in prescribed IT, they define the information that a system of transfiguration needs to store and the operations that it needs to support for producing plausible data in prescribed information systems. Some procedures are simple, such as the procedures that salespeople had to follow when reporting the names of customer contacts that were required for records of sales calls. Other procedures are more complex, such as the procedures that salespeople followed when calculating the setup fees and quarterly payments that were required for records of sales. Desk salespeople used simple tables to support their recording service calls as sales calls. However, they used a complex network of artifacts to calculate, integrate and record the information required for a complete sales record.

Second, when managers specify the procedures to produce data in prescribed IT, they define a gap between the functionalities that salespeople enact with their system of documentation and the functionalities that salespeople need to enact with their system of transfiguration. Thus doing they specify the functionalities of systems of transfiguration that cannot be improvised in systems of documentation and instead require improvised artifacts of their own. Desk salespeople were able to use the information in their to-do piles to gather some of the data necessary to produce sales records in Siebel, such as the customer's name and the products being sold. However, they needed to improvise artifacts such as disposable aids to scaffold the calculation of setup fees and quarterly payments.

The effect of surveillance practices on the systems of transfiguration that employees use to produce data for systems of representation suggests that when managers frame prescribed technologies away from employees' everyday work through their surveillance practices, they not only trigger the improvisation of a system of documentation where employees can carry out their work away from surveillance, but also trigger the improvisation of a system of transfiguration that employees use to create representations of enough compliance with procedures and goals to keep surveillance away from their everyday work and the system of documentation that scaffolds it. Our research at DeskSales emphasizes just how much labor this representation can be and how complex the system that scaffolds it might become. Thus doing, it extends and specifies current research on IT adoption.

Conclusion: a dramaturgical model of it adoption

How can employees improvise with and around (ie. appropriate) information systems while managers monitor compliance with their company's information systems and with the procedures encoded therein?

Our research at DeskSales shows that employees can appropriate IT under managerial supervision by transforming the information that they need to carry out their everyday work —which they keep on their own information systems that they improvise by appropriating their company's information system — into records of compliance with the prescribed procedures encoded in their company's information systems. This process is an alternative to a negotiated order that exempts employees from surveillance which is best described as enforced representation.

Managers enforce the representation of work in electronic front regions, rather than accept their concealment in electronic back regions

Our research at DeskSales shows that when managers monitor employees' compliance with the prescribed procedures encoded in information systems, they can still be aware of employees' need to deviate from, and improvise around the prescribed procedures encoded in their company's IT to their situated conditions for action. Our research at DeskSales shows that even if supervisors may not be able to exempt their employees from complying with prescribed information systems and with the targets and procedures encoded therein, they are still aware that employees need to appropriate information systems to their own situated conditions for action and that they, their supervisors, can profit from employees' ability to do so. However, our research at DeskSales shows that managers do not need to concede to employees' attempts at resisting their company's IT to allow their employees enough of a back region to appropriate IT as they need to address their everyday challenges. Instead, our research at DeskSales shows that managers can impose upon their employees the representation of compliance with the prescribed procedures encoded in their company's information system to discourage surveillance from the rest of the organization and thus allow employees enough of a back region to improvise with and around information systems.

Our research at DeskSales points toward two factors that affect the type of supervision that managers choose to enact over their employees' use of their company's information systems. One factor is the gap between the data about employees' work that information systems can provide and the data that the company uses to monitor employees' work. This gap specifies how lenient managers can be towards employees' improvisations with and around information systems. The other factor is the gap between the prescribed procedures encoded in a company's information systems and the everyday work practices that employees enact to address their everyday work. This gap specifies how lenient managers must be towards employees' improvisations with and around information systems. At DeskSales managers enforced representation because they were unable to exempt employees from using Siebel but they wanted their employees to carry out the unprescribed service work to be able to report compliance with the prescribed procedures encoded therein. Research shows that managers enact negotiated invisibility when they are able to exempt employees from using their company's information systems to allow them to deviate from the prescribed procedures encoded therein and improvise work practices of their own to cope with their everyday challenges. Research on computer-mediated surveillance (eg. Ball and Wilson 2000) argues that when employees' work practices are close enough to their company's prescribed procedures, managers will enforce compliance with information systems to take advantage of the anticipatory conformity that computer-mediated surveillance induces.

Employees keep a back region by reporting enough compliance to discourage supervision instead of keeping a back region by resisting information systems to prevent supervision.

Our research at DeskSales shows that employees can create a representation of compliance with prescribed targets, prescribed procedures and prescribed information systems without achieving any of the goals imposed upon them, without following any of the procedures that managers monitor and without using prescribed information systems as managers intend them to do so.

The back regions that employees are able to carve for themselves thus hide a very different set of practices from that which are hidden in the back regions that employees are able to carve for themselves through negotiated invisibility. In negotiated invisibility, employees use back regions to deviate from, and improvise around prescribed procedure as much as they need to be able to carry out their work tasks under contingencies that their company has not taken into account when deciding the work procedures to inscribed in information systems.

In enforced representation, people also use back regions to do transfiguration work, which all the work necessary to create a representation of compliance in their company's information systems with the prescribed procedures encoded therein. Our research at DeskSales shows that employees may do nothing else but transfiguration work and whatever unprescribed work they need to do to be able to report compliance with the prescribed procedures encoded in information systems. Salespeople only did service work to be able to find enough orders to report as sales. This is a continuous effort of transfiguration that competes with work, rather than a one shot effort of persuasion

This distinction between the work that is done in back regions under negotiated invisibility and the work that is done in back regions under imposed representation is reflected in the distinction between the way in which IT is appropriated in negotiated invisibility and the way IT is appropriated in imposed representation. In both cases, the adoption of technology consists of selecting a subset of the procedures encoded in information technology, adapting those procedures and incorporate them in a network of practices scaffolded in other material artifacts. When employees use back regions to carry out their work tasks under conditions for action which are at odds with those that ground the procedures encoded in information technologies, they use and adapt any of the prescribed processes encoded in information technologies which they find useful for their everyday work. Research has shown that there is enough variation among how different employees doing the same job appropriate the same technology thus to allow for a general specification of the type of procedures encoded in information technology which are more likely to be appropriated to help employees carry out their everyday work. When employees use back regions to create a representation of compliance with the prescribed procedures encoded in information technology, they all need to appropriate the set of procedures encoded in information technology that specify the representation of their work and their achievements. At DeskSales, salespeople only used the task management module and the opportunity management module in Siebel, and only to create representations of sales and saleswork after they had done the service work necessary to obtain the orders that they reported as sales. Employees appropriate the prescribed procedures encoded in information technology to be able to produce representations of compliance without carrying out any of the tasks that these procedures specify. When information technology is appropriated thus, it is no longer a node of a network of artifacts that people integrate into the improvised information system that scaffolds their everyday work. Instead, when employees use information technology thus, they place it at the end of a chain of material artifacts which scaffolds the work of compiling all the information that they need to record compliance with prescribed procedure.

These two differences between negotiated invisibility and enforced representation recast the effect of managerial supervision on IT adoption. They show that managerial supervision does more than simply increase the amount of people's work which is visible in a front region. It also adds a new front region where employees need to perform compliance, not with the procedures that their company prescribes for their everyday work, but with the reporting procedures encoded in information systems. To make a theatrical analogy, managerial supervision does not bring the audience into the back stage, it adds to the performance that people must do in the front stage, much like the introduction of sound in movies forced actors to be able to memorize and enact dialog in addition to performing action. To put it simply, our research at DeskSales shows that managerial supervision forces employees to appropriate IT for one set of activities other than those required to carry out their everyday work – the set of activities required to produce records of compliance with prescribed procedure in their company's information systems. This means that when managers use information technology for supervision, they introduce an electronic front region where people need to report information about the work practices that they enact in back regions to satisfy the need of managers and peers have for information about their work. This forces employees to improvise with and around (that is, to appropriate) information technology to do this representation in appropriating it to do their work.

This recasts the tension between the two contradictory effects of supervision on employees' adoption of IT: the requirement to comply with a broader range of prescribed goals and the difficulty of keeping enough of a back region to enact the necessary deviations from prescribed procedure to do so. It shows that what managers may interpret as an electronic back region to people's work is instead another front region that employees produce for the benefit of their managers. This front-back region discourages surveillance and allows employees to keep a back region where they produce the representation of compliance. Our research a DeskSales shows that this re-specifies the dilemma imposed by managerial supervision on the adoption of IT as a tension between what salespeople called 'real work' and 'admin work.' This dilemma states that people can only do their real work if they do enough admin work to discourage managerial supervision so that they can enact the deviations and improvisations required to do their real work. However, admin work can take so much of employees' time that employees may not be able to do any real work.

In enforced representation, employees solve this dilemma by only doing the real work required by their admin work. When employees are able to establish a negotiated order that exempts them from using their company's IT, employees solve this dilemma by persuading their managers to exempt them from admin

work. Research on computer-mediated surveillance shows that IT takes over the admin work from employees but at the cost of preventing any improvisation that employees need to enact with and around IT to carry out their real work.

The contribution of our research at DeskSales to research on IT adoption is to specify the effect of managerial surveillance, which has been found to be one of the main factors affecting people's use of IT at work, on people's improvisations with and around IT beyond what can be induced from the existing literature. We have done so by arguing that this effect is best specified as that of adding the production of a record of compliance to the tasks for which people need to improvise with and around IT. Our research at DeskSales shows that when employees have to do this work they are taking on in a very burdensome achievement that not only requires people to engage in unprescribed work but also requires people to improvise an information systems that can scaffold that work.

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