Organization, Information, Maintenance

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Abstract

Information, documents and texts have been regularly studied for their role in organizing, notably as material artifacts and 'immutable mobiles' (Latour). Yet, stability and immutability can not be considered as intrinsic properties for information. As for interactions (Goffman), objects and infrastructures (Graham & Thrift), information is repaired and maintained. We will investigate two domains of information maintenance: the repair practices of juridical documents in bailiffs offices and the maintenance of data in information security departments of several organizations. Each case highlights a specific logic of maintenance: a repair work from backstage and a distributed awareness of material fragilities. In the first logic, the sociomaterial order is regularly rebuilt through specific cure operations. It rests on a boundary between professionals and ordinary people, experts and laypersons. In the second logic, the sociomaterial order is never performed completely. Information is fragile in essence and everyone has to permanently take care of it.

Information, inscription and stability

In organization studies, one way to address the issue of materiality consists in focusing on artifacts or devices as distinct entities. Such a program is for example adopted in post-giddensian studies that see in materiality a key feature of structurationism. Artifacts and technologies are here mainly studied as inanimate objects within which social relations or political categories has been frozen. One can find more or less the same vocabulary in the first version of Actor-Network-Theory, especially on its "machiavellian or managerialist" side (Law 1999: 5, which studies artifacts with the help of such notions as 'black boxes' to describe them as the material result of the stabilization of a sociotechnical network.

One of the paradigmatic objects of this perspective on materiality in organizations is information and its enactment: inscriptions, informational artifacts, written objects… These studies draw on several research traditions, mobilizing results such as the role of record keeping or list making (Goody 1977), the role of "typographic fixity" (Eisenstein 1979) and information standardization (Yates 1989), or the capacity for certain information to take the form of "immutable mobiles" (Latour 1986). What is emphasized here is the role of scriptural materiality as an agent that strengthens some organizational aspects. The more obvious components of such a process are guidelines, rules, normative documents, and legal records. All these written objects are studied as frozen parts of organizations that actively contribute to the extension of local interactions in time and space.

Several scholars have discussed this perspective that associates materiality, inscription and stability. They all underline its simplistic aspect and insist on the plurality of modes of existence of objects and texts within organization.

A first way to go beyond the simple equation "information materiality = stability" consists in pointing the risk of sheer materialism and technological determinism. Indeed, describing inscriptions, forms and texts as the only operators of some ordering processes amounts to adopt a naive formalism (Star 1995). As Berg (1997) notably showed it, there is no such thing as structuring properties "within" written objects. Forms and documents can not be considered as agent of stability by themselves. During organizing and ordering processes, texts and information are always tightly tied to practices and the role of information technologies can not be studied outside their uses (Orligowski 2000). In other terms, the role of materiality and texts in organization can be studied as the result of the encounter of objects and work practices and especially the "articulation work" implied in the daily functioning of information technologies (Star 1999).

Another way to question the premise of information stability consists in taking into account the plurality of texts' and technology's agentivity. That is what Cooren (2008) does, showing that ambiguity and undecidability are the roots of texts' agency within organizations. It is precisely because the meaning and the force of documents, or conversations, are unpredictable that they do really count. Such a consideration focuses on the place of texts within the constant dialogues that punctuate organizing processes.

These two perspectives both defend an ecological view of information materiality within organization. If they show its importance in the dynamics of ordering and structuring, they also refuse to impute stability to material properties only. For these scholars, the main issue is less the material side of social structures than agency and its hybridity (Barad 2003 ; Latour 2007 ; Cooren 2010).

In this paper we want to explore a third aspect of information materiality by stepping aside and taking a look at practices that have been too often ignored in organization studies, namely repair and maintenance activities. Because they are dedicated to vulnerability and fragility, their comprehension can enrich our understanding of the 'inherent sociomaterial nature of organizational practices' (Orlikowski 2007).

Repair and maintenance

Different studies have focused their attention on the processes of repair and maintenance. The first ones initiate the topic in showing that social order is not an abstract fact that comes from intangible structures but an ongoing process, an emergent phenomenon in the interaction between actors. As a result of this continual interpersonal practice, social order is here conceived as a delicate affair where repair practices are countless. For instance, Goffman (1971) has pointed out in extremely detailed accounts how "remedial interchanges" are crucial in face to face daily interactions. Pushing such approach a step further, ethnomethodologists have emphasized the role of repair as a category of analysis in conversation (Garfinkel 1967 ; Schegloff et al. 1977). Repair is here conceived as a specific technique used by competent actors to fix breakdowns in language during exchanges, to preserve the face of interactants, and to retrieve an acceptable definition of the situation. While Goffman was mainly interested in face to face interactions that occur in urban daily situations, ethnomethodological studies have taken work settings as relevant places to analyse the production of social order. But the study of repair processes has mainly been limited to the study of talk.

More recently, some researchers have suggested to go beyond this exclusive attention to conversational exchanges by taking into account material aspects of situations: as parts of the making of social order, repair and maintenance activities have been extended to the study of material order (Henke 2000 ; Graham et Thrift 2007). Such inquiries focus on the failure of technical devices and the interventions on the materiality of technological systems entailed to restore them. Whether the study concerns photocopiers technicians (Orr 1996), car mechanics (Dant 2010), or even consumers at home (Gregson et al 2009), it generally points out the ways repair activities involve not only the body of skilled people but also the materiality of artifacts that are repaired, replaced or maintained. In this perspective, social order is then conceived as a fragile result of the restoration of both material arrangements that shape situations and people that actively populate them. In others words, repairing an artifacts or a technical device is simultaneously repairing the persons and maintaining the organization.

These studies are important for social theory in general and the sociology of repair in particular: by insisting on the perpetual production of social and material order, they stress its instability, its potential failures and fragility. Such an approach is relevant to investigate the vulnerability of information and documents in organizations.

In this paper, we will study two cases, which will allow us to illustrate specific manners in handling the fragility of texts and information: the repair work of legal documents in bailiff's offices and the maintenance of information security in organizations.

The first case focused on the bailiff's office as a workplace devoted to the production of deeds, in the same way laboratory studies analyzed scientific activities (Knorr-Cetina 1995). The analysis, based on an eight months ethnography, interviews and the collect of various documents, consisted in following a bailiff and her assistants (clerks and secretaries) while they were doing paperwork and making cases by mobilizing several juridical devices and technical resources. These investigations allowed to understand a twofold process: the strength of legal records and the vulnerability of deeds in the hands of the people in charge of their everyday production.

The second case investigated the practices dedicated to information security in 43 very diverse public and private organizations. In-depth interviews, with a time span of one hour and half on average, were conducted with employees: 17 information security managers and 26 users. Interviews were organized around the information security policy and the day-to-day activities that support it. These investigations notably allowed to understand the importance of risks definition and awareness-raising practices.

We will first study the issue of vulnerability separately from one case to the other, by pointing out the main practices involved in repair and maintenance work in each. Then, we will show how each case highlights a specific logic of maintenance.

Repairing deeds

A bailiff's intervention consists in the enforcement of decisions made in courts: debts recovery, seizures, evictions. Bailiff certainly acts to repair an injury, but her intervention is neither reducible to remedial interchanges typical of face to face interactions, nor to material operations carried out by technicians on more or less complex machines. To act properly, a bailiff is equipped with particular documents: it is only with a deed in her hand that a bailiff can repair some injuries.

The production of bailiff's deeds

In the legal world, a deed is as much a specific act accomplished by a professional as a singular document that is produced on-the-spot or some days after her intervention. It links material and pragmatical properties. The enforcement of judicial decisions consists in this strong articulation between acting and writing. For the deeds produced in a bailiff's office to be efficient and operative, they have to be made according to a particular process and to come with a specific form.

Before being part of a legal record, an ordinary sheet of paper has to be the object of successive substantial transformations (Pontille 2006). First, it takes the form of law after getting into different networks: the one of legal cases and procedures where files have been attributed specific references such as lienor and debtor names; the network of deeds manufactured everyday in the bailiff's office and the singular place ascribed to each document by a number in this production chain; the economic network in which each text constitutes a commodity with a certain cost, generally detailed in a table displayed in the margin of deed. Second, it takes the form of law through substantial material transformations: the inscription of several handwritten marks (date, stamps, signatory); the attachment of a particular textual object, the "executory formula" (in French "formule exécutoire") delivered by the court to systematically stipulate the conditions of judgment enforcement[1]; and its progressive transformation into an archived object in a particular colored folder. It is through such a process that a deed acquires a juridical value: that is, a specific capacity of action for a precisely defined time.

The production of deeds in a bailiffs' office rests on a distributed assemblage in which humans and devices actively contribute: secretaries, shelves, files, computers, staples, printers, paper clips, and of course bailiffs. Yet, as a result of this production process, sometimes deeds come with manufacturing defects. In this case, the document is for sure the product of the bailiff's office machinery, but its status is uncertain: it is no more or not yet a substantial and tangible deed. And the bailiff is not able to act properly with such faulty documents. To actually become a deed, to find again its capacity of action and its juridical value, the document necessarily has to be repaired. How is a bailiff's deed retrieved in concrete terms? What are the main textual and material operations involved in such a repair work?
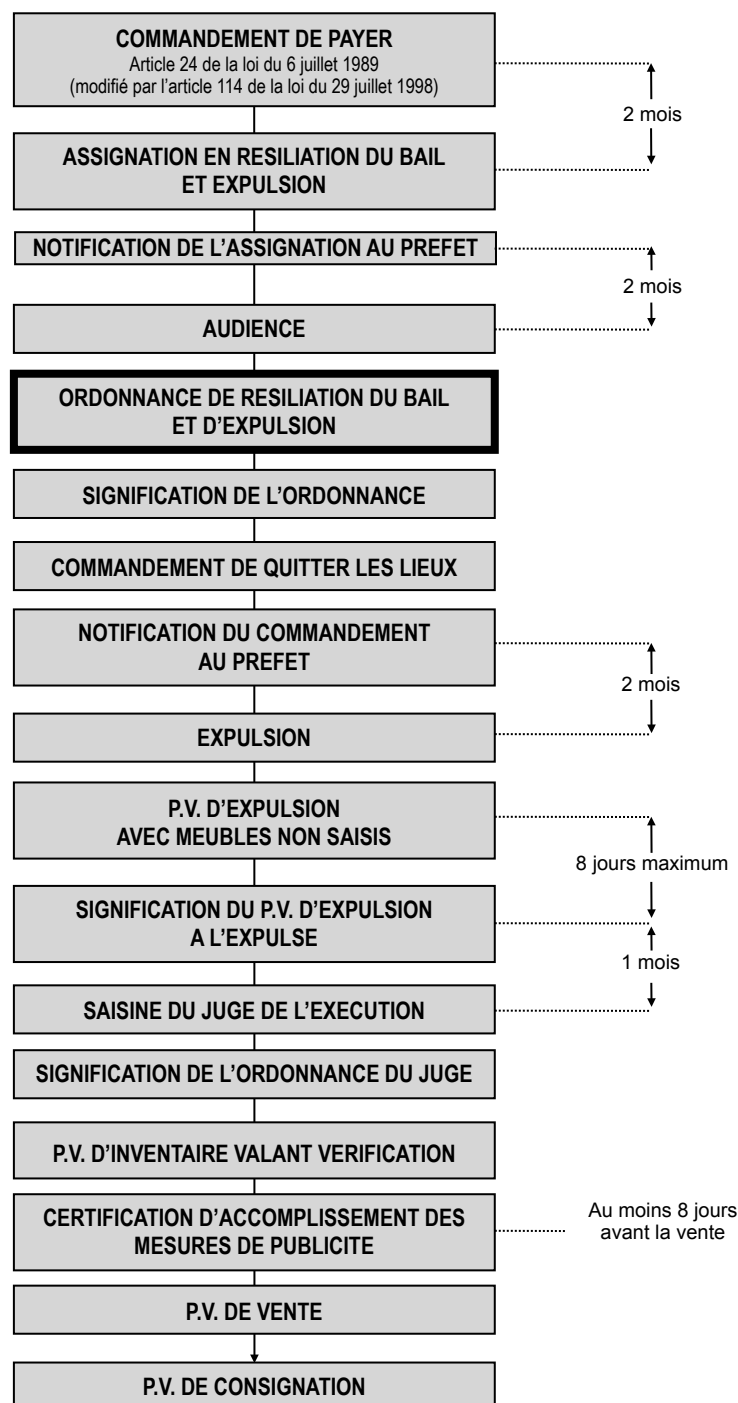
A faulty document

Let's focus on a singular case that arose during fieldwork to better understand what repairing a deed concretely means. The case is part of an eviction procedure that supposes to successively produce several deeds before the actual eviction of a debtor to be done. As we can see on

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[1] Each executory formula is fully part of a deed: not only it is included in the pages count, but it also must be strongly attached to the deed with a staple or a paper clip.

figure 1, this procedure both defines a particular sequence of deeds production and specifies strict production times between each document. This sequential and temporal order is crucial: if a document is produced before or after another, or if it is drew up after its production time, the whole procedure collapses.

Figure 1. An eviction procedure framework (simplified version)

COMMANDEMENT DE PAYER
Article 24 de la loi du 6 juillet 1989
(modifié par l'article 114 de la loi du 29 juillet 1998)

2 mois

ASSIGNATION EN RESILIATION DU BAIL ET EXPULSION

NOTIFICATION DE L'ASSIGNATION AU PREFET

2 mois

AUDIENCE

ORDONNANCE DE RESILIATION DU BAIL ET D'EXPULSION

SIGNIFICATION DE L'ORDONNANCE

COMMANDEMENT DE QUITTER LES LIEUX

NOTIFICATION DU COMMANDEMENT AU PREFET

2 mois

EXPULSION

P.V. D'EXPULSION AVEC MEUBLES NON SAISIS

8 jours maximum

SIGNIFICATION DU P.V. D'EXPULSION A L'EXPULSE

1 mois

SAISINE DU JUGE DE L'EXECUTION

SIGNIFICATION DE L'ORDONNANCE DU JUGE

P.V. D'INVENTAIRE VALANT VERIFICATION

CERTIFICATION D'ACCOMPLISSEMENT DES MESURES DE PUBLICITE

Au moins 8 jours avant la vente

P.V. DE VENTE

P.V. DE CONSIGNATION

The procedure went on up to the production of a particular judge's order entitled "order to cancel a lease and to evict" (in French "ordonnance de résiliation du bail et d'expulsion"). This deed is essential for a bailiff to proceed to an eviction: entering a home, clearing it from all furnitures, and changing the lock. In this case, the order has been issued by the relevant instance, that is the judge from the appropriate court. It has followed the different planned steps of the eviction procedure and it has circulated to the bailiff's office in accordance with all legal requirements.

But, when it arrived at the office, the document was discussed, and the bailiff wrote a letter to the lienor's attorney: she stipulated that the order does not meet the legal requirements. More precisely, it has a "meaningless phrasing" that stopped any kind of intervention. The order part dedicated to the bailiff's action was enigmatic and its content too confusing for her to act. As a result, the bailiff could not enforce the decision made by the judge.

One can think that it would be sufficient to produce a brand new deed that meets all the legal requirements. Instead of getting rid of the uncompleted and confusing order, two main activities were essential to turn this weird document into an operative deed: not only modifying the text to correct its meaningless phrasing, but also directly transforming its materiality so that it could find again its full juridical value.

Coping with textual materiality

To be valid and operative, the order must stand as a coherent text. So, rewriting it as comprehensible as possible would had been a solution. But the second page of the order that detailed the judge's decisions was missing from the initial document. Then, correcting the "meaningless phrasing" was not reduced to a wording issue. As crucial as it is, writing would not had been sufficient. On the contrary, the repair work consisted in reconstituting the missing page in order to obtain an argument without any flaw. And to do such a reconstitution, the first version of the order was needed as a basis. The reworked version corrected the initial one by emphasizing its "material mistake":

> Par ordonnance du 19 septembre 1997 le juge des référés du tribunal d'instance a rendu une ordonnance dont le dispositif est le suivant […]

> Sur saisine d'office le juge des référés a convoqué les parties pour qu'il soit statué sur une erreur matérielle affectant la décision, la deuxième page de la décision ayant été omise […]

> Figure au dossier le factum du magistrat rédacteur qui permet de reconstituer la teneur de la page omise. Cette page est en cohérence avec la décision telle qu'elle résulte du dispositif et des mentions du plumitif.

> Par voie de conséquence la reconstitution de cette page, qui n'a pas été retrouvée, constitue bien la rectification d'une erreur matérielle au sens de l'article 462 du Nouveau Code de Procédure Civile qui ne modifie pas les droits et obligations des parties tels qu'ils résultent de la décision […]

> Dit que l'ordonnance du 19 septembre 1997 sera rectifiée en ce sens qu'il sera inséré une deuxième page ainsi conçue […]

> Dit que mention de cette rectification sera portée en marge de la minute de l'ordonnance du 19 septembre 1997 et que la page ainsi omise sera annexée à cette décision […]

> (Extraits des minutes du greffe)

The making of a new version, as efficient and operative as possible, clearly resulted in the realization of different substantial actions.

First, the document had been firmly reinscribed in the network of texts, typical of the chain of obligations highlighted by Latour (2009). Even if a faulty document, it was still haunted by the material presence of legal record2 and pregnant with distinctive judicial inscriptions. It was

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2 For a theoretical discussion about the haunting question of textual agency, see Cooren (2009).

supposed to acquire a legal consistency during its ascription of a singular place in an eviction procedure and its attribution of several codes and handwritten marks done by a particular bailiff's office. To leave its uncertain status, being between a no more or not yet deed, the document had to be situated one more time in the whole production process made of diverse written objects: the "factum made by the drafter judge", the "article 462 of procedures code", the "original draft of the edict of 19/09/1997". The repair work precisely consisted in reinscribing more strongly this document, as a tangible entity, into the production chain that gives its meaning and its capacity of action.

This tangibility of deed is reinforced by the vocabulary used in the modified version. The document materiality was clearly enhanced: the phrase "material mistake" not only indicates a deed is an object that can be grasped, but also that its state may be "affected", one can "reconstitutes its content", and its body can be modified "by inserting a second page". And emendation also concerned the necessity for a new original draft of the "executory formula" to be firmly attached to the rewritten document. All these material interventions emphasized the scope and the specificity of the repair work: the vulnerability of the initial document had to be fixed in minute detail and for each step of the production chain of deeds.

Recovering juridical value

Second, the deed circulated again in different sites: the particular court from which it comes from and the bailiff's office designated to enforce the decision. However, the meaningless wording of the initial document entailed a longer process. The deed had to circulate along the whole chain of actors. Of course, judge and bailiff got involved, but also the lienor's attorney that corresponded with bailiff about the faulty document, and the litigants themselves that were asked to attend "in order to rule on the material mistake" of the deed. At last, the document was sent to the clerk's court in order to make a new version, with textual coherence and argument meaning. By circulating in several hands, by following such an adjusted trajectory, the content of the document was assessed and its argument was revised and corrected. Then, the deed recovered its juridical value through such a step by step circulation to different judicial authorities.

Third, all the textual and material modifications were made fully visible. To be relevant, the new version of the deed had to display each intervention: additions, emendations, crossing out were systematically recorded "in the margin of the initial order". The visibility was reinforced by the fact that each reported correction had been dated and signed by the public officer. Moreover, the missing page in the first version was conspicuously "appended" to the modified version of the order. Such a work contrasts with numerous situations in which the defects of an object are fixed by systematically erasing any act of repair. It is the case for typical interventions of car repair (Graham et Thrift 2007) as well as the maintenance of a wayfinding system where the cleaning of signboards aims at withdraw traces left by workers to enhance their brightness (Denis et Pontille 2010). Thus the repair work of deeds takes a very specific form. For a large part, the value of both the deed and the repair work lies in the explicit visibility process of all the textual and material changes done in a particular document.

Repair work is not reducible to the document, it concerns more generally the broad situation. By fixing the deed, bailiff and her assistants assure the lienor that the situation can be resolved: in return to his patience, he will actually recover his apartment. Repairing the faulty document is a precondition to the reparation of injury. But the circumference of repair work is more larger: during the whole set of scrupulous writing practices, the entire legal system is maintained in its integrity et efficiency. As in many situations, the repair work produces wider effects than concerning the sole interaction participants, whether they are people or material objects (Henke 2000 ; Graham et Thrift 2007). Then, the main objective of the whole process is to get back to a normal situation by reaching a general appeasement (Goffman 1971).

Dealing with data vulnerabilities

The last decade, information security has become more and more important within organizations. Dedicated departments have been created; rules, procedures and policies have been written, which all aim to heighten users' awareness of the risks incurred by data and information systems. Parallel to the massive computerization of work and processes and the explosion of data and electronic information within organizations, a whole world has surfaced, shaping the dark side of information and communication technologies. A world where people and artifacts are restlessly dealing with such dangers as intrusion, disclosure or destruction. In other terms, ICTs are staged by their promoters as essential to companies' competitiveness and to good organizational coordination, but their uses are, in the same time, depicted as highly risky.

A lot of issues can be raised from such an apparent paradox. However, we do not pretend here to give an overall description of the whole information security industry. Instead, we will focus on information security policies and pay specific attention to the concrete activities of information security departments. Such a perspective allows to go beyond the official and normative description of information security and to understand what it daily takes to maintain information and data security. Studying the documents and practices that daily tell and show users what they have to do in order to insure security will lead to discover another aspect of information maintenance and repair within organizations. Here, it is not a particular object that is stigmatized as faulty: information security is less a matter of defaults identification within specific documents than an invitation to deal with vulnerability as digital data's and electronic infrastructures' intrinsic "nature".

Staging the risks

For our purpose, we will focus on an essential component of information security policies : risks and their identification. Indeed, a great part of information security departments' activity consists in making people (employees, but also managers and directors) sensitive to the numerous dangers they incur when working with computers, using softwares or communicating on-line.

Three main kinds of risk are staged by the information security departments that have been studied. Each of them can be understood not only as a definition of a specific danger but as a broader framework that identifies relevant entities and correlative actions that have to be done.

The first one is identified through the figure of contamination. Very common, this figure places dangerous entities, such as viruses or malwares, at the center of people's preoccupations. It also implies a certain definition of electronic networks that are conceived of as an environment within which people and machines are immersed. This electronic environment carries a lot of dangers. First of all it is unhealthy, and besides viruses, there are a lot of dirty stuffs that one may "catch" the same way one catches the flu. In a broader sense, the figure of contamination also stages an environment that is both public and open, two qualities that can become problematic for organizations when it comes to ensure the confidentiality of communications. Electronic networks are regularly depicted as worlds full of inquisitive people, if not spies, but also ill-intentioned ones who may conduct attacks against the organization's information system.

The second risk turns on information systems consistency and integrity. The huge amount of electronic data, the sophistication of their assembling and their easy access are indeed both a strength and a weakness for organizations. The fact that pieces of information may be "displaced" or replaced by others very easily is an important concern within information security departments. Such a danger is pervasive. Its description presents ICTs as a set of practices where numerous mistakes and bad handling can happen, all the more so since mundane users may be completely unaware of it.

The third and last risk concern electronic materials themselves. During interviews, the persons in charge of information security regularly point a very simple, but problematic, issue: machines

break. They get lost. Servers for instance are at the center of particular attention. They have dedicated air conditioners and contengency generators. More mundanely, material fragility is a very important aspect in the consciousness-raising work done within information secuity departments where users as considered as especially oblivious to this basic risk.

What is at stake here is neither a particular environment populated with unhealthy entities, nor softwares' complexity, but the very material qualities of ICTs. Users are invited to treat computers, wires or screens carefully. Information security managers want them to be concerned with machines themselves and to treat them as delicate entities that are not as sturdy as they would think.

This short panorama of the risks staged by information security policies highlight a very specific side of maintenance issues and activities that deal with them. Here, policies do not characterize the means of failures or breakdowns repair, but the way properties of data, information systems and electronic communication should be apprehended. Doing so, they insist on one crucial aspect: ICTs are incredibly fragile. And being aware of such fragility is the first means of maintaining a certain level of information security.

The main preventive solutions that are implemented by the same policies will help us to enrich this point and to understand how much fragility and vulnerability are crucial to this specific kind of maintenance work.

Strengthening

For the first two risks, security maintenance is mainly a matter of reinforcement. In the case of contamination, this takes the form of a boundary work. What counts here is the shaping of frontiers within the electronic network between an "inside" (that of organization, and sometimes its partners) and an "outside". Through such a process, the stabilization of entities themselves and their own borders is also at stake. More common measures are the setting up of software or hardware firewalls, which filter all communications. Virtual private networks (VPN) are also used. They are depicted as encryption technologies that allow remote access and build an impremeable network within the public one. They are useful in the case of distant workers who are statutorily "inside" an organization, but may work outside its walls.

> On monte un VPN, un Réseau Privé et Virtuel qui fonctionne comme un tunnel entre le matériel [de l'entreprise] et le réseau [de l'entreprise]. Et tout ce qui se passe là-dedans, tout ce qui passe dans ce réseau privé virtuel, est crypté, ça n'est pas attaquable par Internet… Et le vendeur travaille de chez lui comme s'il était physiquement dans un bureau de [l'entreprise]. *(DSI, Industrie matière première)*.

Such a boundary work may be more radical. For specific data, which are considered as highly sensitive and "strategic", some information security departments recommend complete disconnection. These are stored in a dedicated workstation that does not have any online access.

> Dans l'entreprise quand c'est secret, c'est uniquement étanche, hors flux, hors réseau. On travaille pour des clients qui sont la gendarmerie, qui sont l'État, des choses comme ça, là c'est stratégique. Et là, on a des salles [spécifiques], tout est dédié. (*Ingénieur commercial, télécommunications*).

Security policy here is then a matter of territorialization: that of the network as an threatening outside and, in the same movement, that of machines and exchanges they support whose boundaries are designed and solidified.

The same kind of solutions are dedicated to the risk of inconsistency. In this case, information security goes through the hardening of certain aspects of information systems, by preventing specific activities (such as copying, data replacing, renaming or displacing, document rewriting and so on…). Such a policy draws on what many security engineers consider as one of the

keystones of information security: users profiling. This activity consists in giving specific rights (sometimes temporarily) to specific users, depending on their position within the company.

> On découpe les grands métiers de l'entreprise, ce qu'on autorise à faire ou pas par métier en fonction des niveaux hiérarchiques et des sectorisations géographiques? Ensuite, on met en place les outils ou les contrôles pour empêcher que… pour que la personne puisse faire vraiment ce qui est défini. (*Responsable informatique, énergie*)

This is a very complex operation through which the nature and role of data and that of users are identified, as well as departments, communication processes and so forth.

The diverse solutions briefly exposed here show how difficult the maintenance of information security can be. They all point to strengthening processes that raise large sociotechnical issues. In the vocabulary of Actor Network Theory, such processes could be explain easily in terms of closure and "black-boxization". But such interpretation would not suffice to understand the maintenance issues that are are stake in information security.

Intrinsic fragility

Beyond the territorialization and the ordering processes that occur here, at least two aspects are very important for our questions. First, vulnerability is clearly pointed as an intrinsic property of information systems and electronic communication. This is not something that one could get rid of or that one could repair. Second, consequently, none of these solutions are conceived as permanent ones. They are not meant to "repair" any document or information system. They are explicitly designed as part of a dynamics process that does not clear security problems once and for all. In other terms, ICTs are and remain fragile. The only thing one can do about it is to deal with it.

In the contamination figure, the network, although being unhealthy, remain inescapable. It is the same about the risk of data disorganization: information instability is indissociable from computer supported cooperative work and from electronic communication practices in general. The increasing diversity of ICTs, the growth of communication pathways, the great power of huge databases are never seen as dangers that have to be fought, but as inherent risks that one has to adapt to.

Information security is a matter of communication and more precisely of consciousness-raising. In summerizing how risks are depicted by information security departments we grasped a very specific way of dealing with ICTs and their materiality within organizations. A key issue for dedicated policies is to heighten users awareness of such risks, for users are considered as too confident about ICTs (and such a criticism could be made about organizational studies). Information security discourses bring such awkward notions as fragility and vulnerability to the attention of everyone.

Doing so, they recommend a kind of maintenance work that implies specific attitudes and actions not only from security managers but also from users themselves. This is particularly obvious in the third kind of risk, that of ICTs material fragility. Since machines are easily damaged, users are invited to handle them delicately, to keep a watchul eye on them... In other terms to take care of them. It is striking to see how such a policy (such a manner of organizing the relationships between people and machines within organizations and more generaly such a way to deal with information materiality) resonates with what A. Mol has described in her groundbreaking book as the "logic of care" (Mol 2006). The latter, indeed, is articulated by Mol who writes about health care practices, in order to contrast with the logic of autonomy and patient's choice. One of it main characteristics is that "the logic of care starts out from the fleshiness and fragility of life" (p. 11), which is exactly what information security is about: accepting vulnerability as a permanent property and practicaly deal with it.

Such a posture radically differ from the one we described about bailiff's deeds repair, where producing (or reproducing) sturdy flawless textual artifacts is crucial. Actually, we assume that our two examples allow to articulate two distinct logics of maintenance in which practices, ordering processes and materiality qualities are configured in specific, of not opposite, manners.

Conclusion: two logics of maintenance

In previous works that extended the study of social order to the material aspects of situations, repair and maintenance are often considered as similar or at least as complementary activities. In these studies, the repair work done by interactants to preserve their face or to fix technical devices is strongly articulated to the maintenance of social and material order. Thus, repair and maintenance are thought as processes that necessarily come together (Henke 2000 ; Graham et Thrift 2007).

This point of view is essential to understand the ways repair activities are directly connected to the maintenance of sociomaterial order. But it tends to flatten the specificities of repair work, on the one hand, and maintenance activities, on the other hand. Our analysis of bailiffs' deeds repair and information security gives us the opportunity to open up the discussion about such a taken for granted relation. More precisely, it offers insights into how it is possible to go beyond the blurred differences between repair and maintenance. We propose to highlight two different logics: repair, which consists in curing people or things; and maintenance, which consists in taking care of them.

Repair as cure

Repair work is generally part of a conception of normal situations (Goffman 1971). It is conceived of as the specific rescue for each error, flaw, malfunction, or failure that occur in everyday life. In other terms, the repair work is a crucial means to avoid the extension of any trouble and to recover any unintended breaking of the sociomaterial order. Its main purpose is to get back to a general appeasement by turning breakdowns into what is considered as a normal situation.

This kind of work is entirely then directed toward the re-ordering of situations and the re-stabilization of faulty entities. Whether they are people, machines, or texts, the aim of repair lies in the remaking of their immutability. All these entities are supposed to recover the appearance, abilities, usefulness they had before breakdowns. From such a standpoint, the repair work perfectly fits with the so-called "traditional ANT studies" (Gad & Jensen 2010): if entities achieve their form as a consequence of the relations in which they are located, the repair work precisely consist in rebuilding these semiotic relations. As Henke (2000, p. 60) put it, repair work is "defined as the defense of associations that constitute social order in a workplace". Then the sociomaterial order is regularly rebuilt through operations especially dedicated to the stabilization of people and objects ontology.

These operations oriented toward the stability and durability of entities are part of a particular logic of action that we propose to term "the logic of cure". Drawing on the bailiff case studied here, we propose to identify three of its main dimensions.

First, the logic of cure goes hand in hand with particular procedures. As for curing the body of people in medical practices (Berg 1997), repairing the body of juridical texts comes with very specific detailed conditions of action. Each intervention on a faulty bailiff's document that departs from the legal rules or does not fit with strict criteria of legal writing is likely to spoilt its pragmatic force, that is its juridical value: without strictly sticking with these rules, the repaired document would be null and void, it would not be a deed. As a consequence, there is no rooms for surprise or improvisation. Of course, some documents may come with manufacturing defects, but the due process that shapes the production as well as the remaking of deeds and the chain of required legal documents are planned and defined in extremely precise details.

Following this step-by-step formal process, the document is supposed to progressively become an operative deed. This is a stark contrast to previous studies that emphasized the crucial role of improvisation since fault-finding and repair is a process of ongoing, situated inquiry (Orr 1996 ; Henke 2000).

Second, the logic of cure articulates the consequences of intervention and visibility in a particular manner. When medical practices regularly leave some scars on the body of patients, the repair work of deeds makes fully visible deliberate marks on the body of text. All textual and material modifications, made during its transformation from a faulty document to an efficient deed, exhibit the different stages that were necessary to finally reach back its generic model, that is to take the appropriate form of a standardized juridical text. Then, the value of documents not only lies in formal rules that ground juridical procedures, nor in professional authorities such as bailiffs. It also rests on the materiality of deeds that display all conspicuous traces of repair.

Third, the logic of cure goes through the commitment of professionals conceived of as experts in repair work. Any layperson is not qualified to make a legal record, to produce juridical documents, and even less to play a part in the remaking of a bailiff's deed. The re-ordering of the situation rests on the circulation of faulty documents into the whole network of professional actors: judge, bailiff and her assistants, litigants' attorneys, clerk's court… Each of them actively contributes by assessing the document qualities, pointing out its defect, and doing curing acts, as minimal as some seem to be: identifying the textual incoherence, informing the judge and litigants' attorneys, reconstituting the left page, rewriting the content, modifying the deed materiality, validating the new version. The success results in such a distributed action, but the circulation of documents and different actors involved in the process are exclusively restricted to judicial authorities.

Maintenance as care

In the information security world, there is no such thing as a "normal situation", in which each entity would be stabilized, even temporally, and the environment would be healthy. Not only such a situation does not exists from this standpoint, but it does not represent any possible ideal either. As we saw, vulnerability and its acceptance are at the center of the way dangers and the means to deal with them are staged. That is why we propose to use A. Mol's notion "logic of care" to describe it. Indeed, the latter, Mol writes, "takes failures to be an unavoidable part of life" (p. 92) and allows to "avoid unmarked normality" (p. 11).

The logic of care then radically differs from the logic of cure. Of course, the latter do not idealize a world where objects and people are perpetually healthy and do not die or disappear. But actually, it does not take such consideration into account. What counts in the logic of cure is an isolated situation, a specific set of people, objects or texts that have to be re-ordered. Conversely, in the logic of care situations and objects do not have clear and irrevocable boarders. Furthermore, maintenance work itself is never done once and for all, it is never completed. Such differences have repercussions on the three dimensions we discussed earlier.

First, maintenance as care does not rely on detailed procedures. Contrary to repair as cure, it goes not entirely through standard processes, neither for the realization of care practices nor for the detection of failures and the definition of faulty elements. There are of course a lot of things that are prescribed from information security departments, but it is not about specific operations. Instead, security requirements concern certain kinds of attitude and comportment towards objects whose security has to be maintained. These very attitudes have nothing to do with any planification. Instead, there are all about showing a certain level of vigilance: "something wrong may happen", "if you do not back-up your data you may lose everything you're working on since last copy", "if you surf on the Web without VPN, your communications may be spied on". Care is then a matter of uncertainty and permanent watchfulness.

Second, in the logic of care, maintenance does never only concern objects that have to be taken care of. If in the logic of cure, interventions are made almost exclusively on objects or

bodies in order to get them a new stability, in the care one things are much more spread out. Besides, stability is never achieved, even temporally. As Mol puts it, care is about action, practices, and it systematically engages an hybrid agency within which tasks are shared. Therefore, there is no delimited site for maintenance which occurs as an ongoing sociomaterial process.

Third, and consequently, the logic of care is not restricted to professionals either. This is an important result of Mol's inquiry, which shows that health care practices can be shared not only between, doctors and nurses, but also with patients, their family and friends, in opposition with the ideal of autonomy and individuality. A huge difference between bailiff's deeds repair and information security maintenance lies in the fact that, for the latter, the participation of users is crucial. Taking care of ICTs requires everyone attentiveness.

The three main dimensions detailed here and the distinctions between the two logics are somehow caricatured. That our case studies allows us to highlight such differences does not mean that repair and the logic of cure are incompatible with maintenance and the logic of care. There are of course a lot of situations where the two are overlapping. However, we think that repair and maintenance deserve to be distinguished because, as logics, they draw quite different worlds. One where flaws are clearly identified and damaged objects are treated in specific planned terms in order to bring back normality, and another where flaws are countless and pervasive and where objects are at the center of a permanent attention. A world where order is something that is regularly, but temporally, achieved through delimited reparations, and another where it is constantly maintained through everyone's vigilance.

These two logics also highlight what seems to be two roles for materiality in texts and ICTs agentivity. In the logic of cure, textual artifacts have to be repaired to recover their capacity of action. They only can act once stabilized and "healed", that is when their material properties are fixed and appear as matters of fact. In the logic of care, texts and ICTs are permanently maintained in order, neither completely flawless, nor damaged. Their material properties are a constant matter of concerns.

References

Barad, K., 2003. Posthumanist Performativity: Toward an Understanding of How Matter Comes to Matter. *Signs: Journal of Women in Culture and Society*, 28(3): 801-831.

Berg, M. 1997. *Rationalizing medical work. Decision-support techniques and medical practices*. Cambridge, MIT Press.

Cooren, F. 2008. Between Semiotics and Pragmatics: Opening Language Studies to Textual Agency. *Journal of Pragmatics*, 40: 1–16.

Cooren, F. 2009. The Haunting Question of Textual Agency: Derrida and Garfinkel on Iterability and Eventfulness. *Research on Language and Social Interaction*, 42(1): 42-67.

Cooren F. 2010. *Action and Agency in Dialogue: Passion, Incarnation and Ventriloquism,* Amsterdam / Philadelphia, John Benjamins.

Dant, T., 2010. The Work of Repair: Gesture, Emotion and Sensual Knowledge. *Sociological Research Online*, 15(3).

Denis, J. and Pontille, D. 2010. Placing Subway Signs: Practical Properties of Signs at Work. *Visual Communication*, 9(4): 441-462.

Eisenstein, E.L., 1979. *The Printing Press as an Agent of Change: Communications and Cultural Transformations in Early Modern Europe*. Cambridge: Cambridge University Press.

Gad, C. and Jensen, C. B. 2009. On the Consequences of Post-ANT. *Science, Technology & Human Values*, 35(1): 55-80.

Garfinkel, H. 1967. *Studies in Ethnomethodology*, Englewood-cliffs, Prentice-Hall.

Goffman, E. 1971. *Relations in Public: Micro-Studies of the Public Order*, Basic Books.

Goody, J. 1977. *The Domestication of the Savage Mind*, Cambridge, Cambridge University Press.

Graham, S. and Thrift, N. 2007. Out of Order: Understanding Repair and Maintenance. *Theory, Culture & Society*, 24(3): 1-25.

Gregson, N., Metcalfe, A. and Crewe, L., 2009. Practices of Object Maintenance and Repair: How consumers attend to consumer objects within the home. *Journal of Consumer Culture*, 9(2): 248-272.

Henke, C. 2000. The Mechanics of Workplace Order : Toward a Sociology of Repair. *Berkeley Journal of Sociology*, 44: 55-81.

Knorr Cetina, K. 1995. "Laboratory Studies: The Cultural Approach to the Study of Science" in S. Jasanoff, G.E. Markle, J.C. Petersen and T. Pinch (eds.) *Handbook of Science and Technology Studies*, Sage, London, pp. 140-166.

Latour, B. 1986. Visualization and Cognition. Thinking with Eyes and Hands. *Knowledge and Society*, 6: 1-40.

Latour, B. 2007. *Reassembling the Social: An Introduction to Actor-Network-Theory*, Oxford University Press, USA.

Latour, B. 2009. *The Making of Law – An Ethnography of the Conseil d'Etat*, Cambridge, Polity Press.

Law, J. 1999. "After ANT: Complexity, Naming and Topology." in Law, J. and Hassard, J. (eds) *Actor Network Theory and After*, Oxford, Wiley-Blackwell, pp. 1-14.

Mol, A. 2006. *The Logic of Care. Health and the Problem of Patient Choice*, New York, Routledge.

Orlikowski, W.J., 2000. Using Technology and Constituting Structures: A Practice Lens for Studying Technology in Organizations. *Organization Science*, 11(4): 404-428.

Orlikowski, W.J., 2007. Sociomaterial Practices: Exploring Technology at Work. *Organization Studies*, 28(9): 1435-1448.

Orr, J. E. 1996. *Talking About Machines: An Ethnography of a Modern Job,* Cornell University Press.

Pontille, D. 2006. "Produire des actes juridiques", in A. Bidet, A. Borzeix, T. Pillon, G. Rot and F. Vatin (eds), *Sociologie du Travail et Activité*. Toulouse: Octares Editions, pp. 113-126.

Schegloff, E.A., Jefferson, G. and Sacks, H. 1977. The Preference for Self-Correction in the Organization of Repair for Conversation. *Langage*, 53: 361-382.

Star, S.L. (ed.) 1995. "The Politics of Formal Representations: Wizards, Gurus, and Organizational Complexity", in *The Ecologies of Knowledge: Work and Politics in Science and Technology*, New York, State University of New York Press, pp. 88-118.

Star S.L. 1999. The Ethnography of Infrastructure. *American Behavioural Scientist*, 43(3): 377-391.

Yates, J. 1989. *Control Through Communication: The Rise of System in American Management*, Johns Hopkins University Press.