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MOBILE INFORMATION SYSTEMS AND ORGANIZATIONAL CONTROL: A FOUCAULDIAN APPROACH

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Abstract

The latest advances in the field of communication tools and networks have led to the development of 'mobile' technologies. Mobile technologies provide workers with almost permanent access to their company's Information System (IS) and continual availability of information in time and space, thereby contributing to the development of "mobile IS." Mobile IS generate a reconstruction of the relationship between time and space, and act as catalysts of deeper social and human changes, leading to ambivalent effects in the field of management. More particularly, a paradox emerges with respect to mobile IS as they can be considered in turn as instruments of autonomy and freedom or control of distance activities. To what extent are the interactions between mobile IS and organizational actors liable to change the company's control systems? In this paper, we argue that a Foucauldian approach can enrich our understanding of the evolution of organizational control linked to mobile IS. We present the results of four case studies (based on 85 semi-structured interviews and 10 days of observation). This research shows the relevance of Foucault's conceptual framework (linking discourses, discipline and ethics) to explore the interactions between IS, the organization and individual actors, in a political perspective.

Keywords: Mobile information systems, management control, organizational change, surveillance, case study, IS philosophy (Michel Foucault)

1 INTRODUCTION

The latest advances in the field of communication networks and data processing tools have led to the development of 'mobile' technologies. Mobile Information Technologies (IT) cover a wide range of terminals, such as mobile phones, laptops, personal digital assistants (PDA) and tablet PCs, linked to networks comprising numerous information resources. Lyytinen & Yoo (2002) define mobile technologies as a "network of interconnected technological, social and organizational elements", enabling mobility which is both "physical and social" for the players concerned. Mobile ITs transcend company boundaries and are frequently used in contexts outside business, reflecting the emergence of a form of 'multicontextuality' (Henfridsson & Lindgren 2005). They provide us with almost permanent access to a company's Information System (IS) and continual availability of information in time and space, thereby contributing to the development of "mobile IS." Mobile technologies generate a reconstruction of the relationship between time and space, and act as catalysts of deeper changes that go hand in hand with the use of these tools. Both the concept of work and management and the way companies operate are directly affected by the development of this culture of mobility and the technologies that are its reflection. As they revolutionize the traditional time-space aspect of organizations, they are likely to give rise to new forms of work organization. Today, work is no longer understood as a place, but rather as an activity that can be performed outside traditional spatial and temporal frameworks.

A global discourse, conveyed by the media, IT constructors, and companies, links mobile IS to new types of flexible, responsive, dynamic and non bureaucratic organization systems. The advent of mobile IS thus accompanies managerial and organizational discourse linked to employees' empowerment, emancipation, autonomy, delegation and flexibility. Nevertheless, the characteristics, uses and challenges mobile IS throw up for the organization and management also engender new issues with respect to control. These technologies enable a control of distance activities (Wiredu and Sorensen 2006). In consequence, a paradox emerges with respect to mobile IS as they can be considered in turn as instruments of autonomy or control. Our aim in this paper is to analyse the ambivalent effects of mobile IS in relation to hierarchical relations and control. In addition, if the advantages companies reap from the integration of mobile IS appear undeniable, it is important to keep in mind that the systems are adopted by organizational players who must familiarize themselves with these tools before using them. Mobile IS thus raise the issue of the acceptance of a new form of work organization and re-engineering the relations with the company, reflecting a process of technological, social and human change. It is therefore also important to consider how individuals use these mobile IS, how they perceive the new working conditions that combine autonomy and control, and how they may influence the evolution of systems of control. To what extent is the use of mobile IS in an organization liable to change the company's control systems and what are the ensuing grounds for appropriation? In this paper, we argue that a Foucauldian approach can enrich our understanding of the links between organizational control and mobile IT. This paper is structured as follows. In the second section we present a literature review about the potential links between mobile IS and organizational control. The third section explores Michel Foucault's conceptual framework. The fourth section provides a description of our research method. In the fifth section, we present the successive results of four case studies. These results are then interpreted and discussed in a sixth section. In the final section, we present the contributions and limitations of our research and give some suggestions for future research.

2 MOBILE IS AND ORGANIZATIONAL CONTROL

2.1 Mobile Information Systems and paradoxical effects

It is now widely acknowledged that mobile IS provide an innovative answer to the challenges generated by a competitive, changing and global environment that is shaped by hyper-competitiveness, where companies are subject to cost constraints and an ever greater need for reactivity with respect to their clients and partners. As Varshney (2003) points out, mobile technologies are a way of

introducing a new form of “flexibility, in terms of time and place” into organizations, and in this sense, they offer businesses promising opportunities. Employees can log onto their company’s IS and be in contact at anytime and in any place (Robey et al. 2004). The benefits are numerous, the first being an increase in individual productivity through a decrease in work constraints, greater flexibility, and reduced coordination costs. With enhanced communication and knowledge exchange, these technologies also allow information to be accessed immediately, provide improved decision-making performance and consequently greater reactivity (Davis 2002). More and more companies now provide their employees with mobile ITs, primarily field workers such as sales representatives, consultants and technicians, but also more sedentary workers.

However, the advent of mobile IS and their use within companies can lead to negative side effects which recent studies have brought to light (Robey *et al.* 2004, Cousins and Robey 2005, Besseyre des Horts and Isaac 2007). Demands for almost permanent availability and responsiveness appear to have developed alongside the use of mobile IS by organizations. When employees use mobile technologies, companies have access to a potential form of “digital traceability” (Robey *et al.* 2004), which can give rise to a certain degree of stress. Information and cognitive overload is also linked to the use of mobile technologies within business organizations. Often encompassing a notion of continual availability, the utilization of these technologies raises a number of issues with respect to infringement of private life and the breakdown of borders between private and professional life (Cousins and Robey 2005). It also leads to issues of fragmentation and interruptions at work (Davis, 2002), fostering distraction rather than time for reflection. Similarly, employees may feel oppressed by the emergence of a culture of speed and instantaneousness and a sense of permanent urgency, which obliges them to make over-hasty decisions or decisions in contexts unsuited to decision-making. In addition, as Lyytinen and Yoo (2002) pointed out, several levels of analysis are affected by what they term “nomadic computing,” not only at individual level, but also at the level of the team, and, more widely, the organization. Consequently, it is likely that evolutions in employees’ space-time norms, and the lack of face-to-face interaction will impact on cooperation, cohesion, trust between colleagues, group decision-making and, more generally, interpersonal relations.

Notwithstanding, mobile technologies may be considered as particularly equivocal tools, whose effects cannot be predicted in advance, either in terms of social interaction or of company management (Arnold 2003, Jarveenpa and Lang 2005). To this effect, Cousins and Robey (2005) highlight the contrast between the expected benefits and the unexpected social impact resulting from mobile system environments. At a time when management practices are being reinvented around mobility via the porous nature of time and space, it is important to consider the issues involved in mobile IS and the renewed management style they engender.

2.2 The evolution of control systems associated with mobile IS

More particularly mobile IS raise a challenge concerning the evolution of control systems. Control can be defined as “the effort exercised by managers, not just to collect and share information, but also to use information for directive purposes with their units: the aim is to encourage or provoke a general reaction from the people who report to them” (Mintzberg 1994). A focus on the informational dimension of organizational control indicates that the latter is enabled by data processing and storing. In consequence, given their capacity to save, store and analyse information flows, information technologies are far from being neutral elements with respect to control. Furthermore mobile technologies offer both continuity and discontinuity in comparison with other generations of technologies. They perpetuate certain practices and management methods, such as task allocation, process standardization and activity control (Zuboff 1988), but the liaison opportunities they offer also pave the way for new means of communicating, exchanging information and working outside the traditional corporate space-time framework. Mobile IT revolutionize the traditional time-space aspect of organizations. For instance management today is no longer confined to the company premises but may potentially be practiced anywhere, at anytime and in unexpected contexts. Management is no longer limited to the traditional idea of time-space and no longer necessarily occurs in a context of shared action.

A paradox emerges with respect to mobile IS as they can be considered in turn as instruments of autonomy or control, freedom or servitude. While mobile IS represent a means to promote flexible, responsive, dynamic and non bureaucratic organization systems, they may also be perceived as

instruments that reinforce control and demands in terms of availability and responsiveness, as well as employee traceability, acting as a sort of “electronic lead”, that goes way beyond organizational boundaries (Sorensen and Gibson 2005, Jarveenpa and Lang 2005). Mobile IS appear as tools to enhance the independence and mobility of the workforce, but they are also symbolic of the preservation of the “hierarchical line,” even beyond the company boundaries. More specifically, mobile technologies reflect a dichotomy through the autonomy they offer and their potential as instruments of control (Zuboff 1988). The same technology can thus be considered in two different ways that are entirely contradictory. Jarveenpa and Lang (2005) highlight the different paradoxes that result from the use of mobile IS, some of which are directly linked to control and autonomy, the individual’s decision-making freedom and the constraints that influence their activities (Besseyre des Horts and Isaac 2007). The paradoxes between freedom and servitude, independence and dependency, improvisation or planning, engagement or disengagement, are all conflicting consequences that arise from the use of mobile IS, which reflect both autonomy and control (Besseyre des Horts and Isaac 2007). According to Wiredu and Sorensen (2006), mobile IS raise the question of organizational control, insofar as they play a major role in the control of distance activities.

2.3 Important issues at stake

Mobile IS are far from being neutral tools of communication and information transmission. On the contrary, they may influence systems of control and take place in political contexts, constituted of hierarchical relationships, interactions between organizational actors, power games, negotiations, and conflicts (Markus 1983). Given that mobile IS influence the very foundations of collective action, the space-time dimension of human experience and interpersonal relations, it seems necessary to analyse the political dimension, the power balance and the issues at stake during mobile IS implementation. Different stakes arise, such as the political dimension of these interactions and also attitudes when confronted with control and the technologies that sometimes support it. Given the control potential of mobile IS, it is important indeed to hone in on the attitudes and practices that individuals adopt, and the different interactions possible between individuals and mobile IS. Mobile IS implementation not only represents a technological change but also social and human ones. It is therefore also important to consider how individuals perceive the new working conditions that combine autonomy and control. Even if the individual cannot always choose to accept or reject the technology in an organisational context, he can still choose the manner in which he appropriates it, via varying levels of engagement or involvement. Individual attitudes thus have a necessary influence on systems of control linked to mobile IS implantation. Despite the fact that IS are directly involved in control issues, their effects are in no way predetermined. We should therefore avoid any “determinist perspective”, adopting instead an “emergent perspective”, which dwells on the interactions of system and context of use and offers a means of identifying the political dimension of dialectics between control and IS (Markus 1983). An emergent perspective highlights the interactions between the technological, individual and organizational choices, together with their integration in a political context involving the interactions between players and their relation to power (Markus and Robey 1988). This analysis highlights the importance of placing our research in an overarching framework that enables us to analyse the ambivalent effects and the paradoxes of mobile IS in terms of control, with a focus on the interactions between the players, the organisation and IS. It seems necessary to develop a conceptual framework to explore the relationships between individuals, the organisation and technology in the light of control issues, at the same time taking the political dimension of these interactions into consideration. As shown in the following section, our attention was drawn to the thinking developed by a particular theorist, Michel Foucault. We believe that his work provides tremendous potential for developing a new approach to technological and organizational change.

3 CONCEPTUAL FRAMEWORK: THE RELEVANCE OF A FOUCALDIAN PERSPECTIVE

This section provides an analytical framework based on Michel Foucault’s work, whose main concepts can provide in-depth insights when applied to research in management and IS.

3.1 Three conceptual entities: discourse, discipline and ethics

Foucault's genealogical method, which focuses on three conceptual entities - "discourses", "discipline" and "ethics" - appears highly relevant in analyzing some emerging forms of organization, closely linked to the effects of information control promoted by IS.

3.1.1 *Discourse:*

Foucault (1971) examined the social effects of the knowledge produced by discourses. According to Foucault, discourses both create and control the objects they claim to know. The social world is organized and normalised in specific ways through discursive practices. The Foucauldian perspective shows that discourses are far from neutral, and constitute the "crucial way" to the exercise of power. For example, in his early writings, Foucault shows how madness, prisons, the body, life, death, and above all human beings, progressively became the objects of observation and new scientific discourses, which offer "an insidious form of social control." In this way, organizations can be seen as political arenas where discourses are manipulated to influence individuals. Several studies in organization theory focus on the discursive practices that constitute organizations as regimes of truth and discipline, and act as a powerful constraint on the organizational members (Sewell and Wilkinson 1992, Barker 1993, Knights 1997). Organizations are considered as political spaces where discourses are constituted (Barker 1993) to better control organizational members. Foucault emphasizes the deeply relational nature of power and its incarnation in discursive practices which convey representations of the organization and technology.

3.1.2 *Control mechanisms and discipline:*

This focus on discourse, truth and knowledge enables Foucault to develop the image of a disciplinary-based modern society. In this disciplinary society, various means, technologies and practices - such as "hierarchical observation", "normalizing judgment", and "dressage" - are used to govern men. Hierarchical observation, combined with division and classification practices, enable to closely supervise organizational members. Moreover, a deep process of normalization enables to establish goals, to compare individuals and to make distinctions between modern subjects. Finally, "dressage" practices render bodies and minds obedient, docile and useful. Foucault (1975) explains how the soul, conscience and thought progressively became the primary objects for punishment and rehabilitation. These practices enable to discipline and to correct abnormal behaviours. Every aspect of human life is controlled through the construction of a "micropower." Foucault uses the metaphor of the "panopticon" developed by Bentham (1791) to represent this disciplinary power. In panoptic architecture, observers can observe all prisoners without the prisoners being aware that they are being watched. The panopticon is characterized by invisible surveillance, a depersonalization of power, an embedding of controls, and subtle coercive mechanisms. In this way, technologies can be seen as object of disciplinary power, while the development of specific discourse legitimizes its adoption and use. Many authors relied on this panopticon metaphor to show the role of IT in surveillance, though the concepts of "electronic panopticon" or "electronic eye" (Willcocks 2004; Lyon 1994).

3.1.3 *Ethics and resistance:*

Because of his developments regarding disciplinary power, Foucault was accused of developing his own "iron cage," where the human subject appears passive and subject to an entire disciplinary society. This led Foucault to develop his consideration of "ethic" for and "care of the self". Foucault (1976-1984) describes a responsible individual actor who is able to resist disciplinary practices. "Here Foucault focuses on a more active, individual subjectivity, less imprisoned in and less constructed through scientific discourse and power relations, more geared to self-knowledge supporting work of self on the self, to constitute a self-stylization able to separate from subjectification practices" (Willcocks 2004:248). Foucault considers that individuals are able to find satisfaction in constraining situations through ethics. Foucault identifies different kinds of "technologies of the self" which allow individuals to work on themselves by regulating their bodies and thought and by constructing their identity (McKinlay and Starkey 1997). Modern subjects can subvert the conditions of their own subjectivity and constitute themselves as moral agents through ethics (Willcocks 2004).

3.2 The Foucauldian perspective: toward a renewed overarching theoretical framework

The ideas developed by Foucault provide us with a conceptual framework with powerful heuristic possibilities. At the centre of Foucault's thinking, the concept of "power-knowledge" provides us with a tool to grasp the links between his conceptual entities (discourses; power and control; and human agency). Power produces knowledge, and discourse and knowledge have power and truth effects. "Power and knowledge directly imply one another...there is no power relation without the correlative constitution of a field of knowledge, nor any knowledge that does not presuppose and constitute power relations" (Foucault 1975). This concept implies that disciplinary power permeates the social body through power-knowledge relationships. But it also reveals that power relations are not merely negative but productive as well. "Power must be analyzed as something that circulates...Power is exercised through networks, and individuals do not simply circulate in those networks: they are in a position to both submit to and exercise this power. They are never the inert or consenting targets of power; they are always its relays" (Foucault 1975). In consequence, there are no relations of power without resistance. Foucault identifies the existence of norms that condition behaviours, but meanwhile recognizes that individuals are able to resist such norms.

Foucault's main concepts can be usefully harnessed to management research, particularly in IS research. Foucault's ideas encompass the issues of discourse with respect to a phenomenon, control and resistance within a single conceptual framework, at the same time placing the individual at the heart of the question. Foucault endeavoured to bring out the relative character of "discourse" and truths by identifying "power/knowledge" games that both engender and drive them. 'Man' is not simply an object of knowledge, but is also an object of power, which is expressed in micro-physics and disciplinary technologies. Beyond these disciplinary mechanisms, however, 'Man' also appears as a moral agent, subject to a certain form of behaviour and motivated by a deep "care of self" ethic.

The Foucauldian approach moreover provides a novel definition of technology, allowing us to consider IT as an "electronic panopticon," and also as technologies embedded in the micro-physics of life, power relations, discourse, and resistance moves. Willcocks, for example, develops an analysis of "behavioural and social technologies encoded in material technologies" (Willcocks 2004, p.289), while Knights and Murray (1994), developing a Foucauldian perspective, consider IS as "a set of human and non human artefacts, processes and practices, ordinarily directed toward modifying or transforming natural and social phenomena in pursuit of human purposes." Technology mirrors a vision of the organization and the intentions of decision-makers, but its effects can never be predicted in advance. Developing a Foucauldian approach, Bloomfield suggested: "Technology does not impact on organizations or society: a change in social relations, tasks, skills and knowledge is already prefigured in the way that the technology is conceived and constructed. Machines do not control social relations: they presuppose, mediate and reinforce them" (Bloomfield 1995, p.497).

As regards our research question, the introduction of mobile IS into the workplace has given rise to certain arguments concerning the transparency provided by these technologies, the increase in autonomy and the potential for new forms of work organization to emerge. A Foucauldian perspective enables us to see beyond these discourses and understand how such technologies are employed in systems of control. The Foucauldian approach thus provides a means to analyze how certain technological resources may be used in a hierarchical relationship and what changes arise as a result of these tools in terms of organizational control and autonomy. Moreover this approach enables us to explore individual reactions and attitudes towards technology and underlying effects on systems of control. Thus, at a time when management is built around discourse, a Foucauldian perspective provides an interpretative framework that helps us understand how certain technological resources may be used in a hierarchical relationship via power-knowledge relations, and how control systems can be influenced by individual interactions. This approach informs the development of a political model of technological and organizational changes in organizations, that we will confront to reality in a qualitative empirical study (Figure 1).

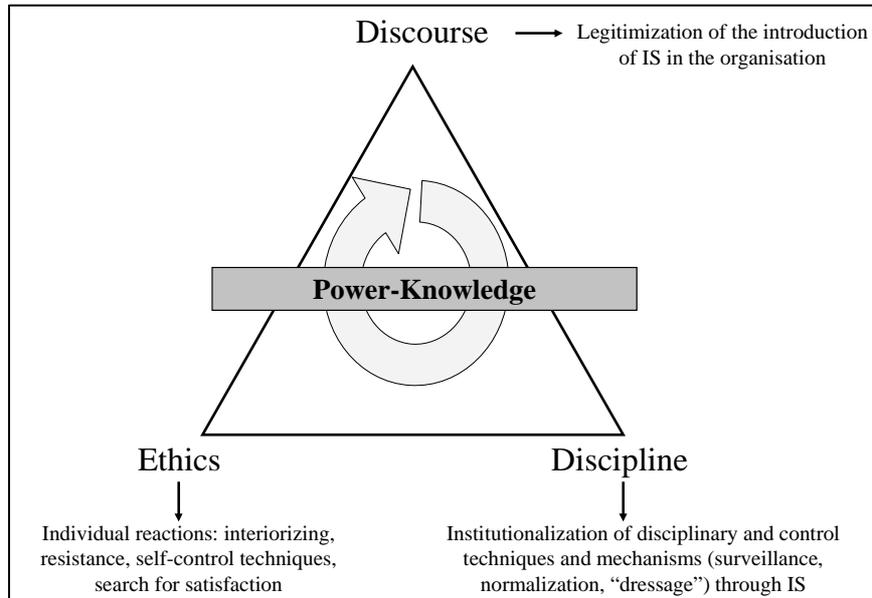


Figure 1: Conceptual Framework – A Foucauldian approach of technological change

4 RESEARCH METHOD

Our study has adopted a “dialogical perspective” (Leidner and Schultze 2002), which allows us to study the nature of a constructed reality as well as the impacts of power-knowledge and discipline. We developed a qualitative study of four cases, representing high diversity, to explore the empirical contributions of a Foucauldian approach to the analysis of interactions between mobile IS, individuals and organizations from the perspective of organizational control systems. This empirical research study includes different kinds of data: primary data consist of semi-directive interviews and direct field observations. Secondary data include internal documentation, meetings, and press reviews. We interviewed different levels of respondents: managers and top managers (CEO, CIO, human resource managers, operational managers, middle managers, area managers) and field workers (equipped with mobile IT). Our qualitative analysis was developed from both a deductive and an inductive perspective: on the one hand and in accordance with the deductive principle, we identified a priori the main topics (based on Foucault’s conceptual entities which informed the interview guide) related to organizational discourses linked with mobile IT deployment, impacts on the ways of governing employees (control systems, discipline, authority versus empowerment, flexibility, autonomy, decentralization, and delegation), and individual reactions (acceptance of change, resistance moves, adoption and appropriation of mobile technologies). At the same time, in accordance with the inductive perspective, other themes, as expected, emerged from the corpus of transcriptions. Different interview guides were prepared beforehand based on our literature review and in accordance with the different functions performed by respondents. Every interview began with general questions about the respondent (his or her role and responsibilities) and then covered wide-ranging, open topics linked to mobile IS implementation, impacts on systems of control and individual reactions.

A total of **85 semi-structured interviews** of approximately 90 minutes were conducted in four French companies between January 2006 and November 2006. Ten days of direct in the field observation were also carried out in order to enrich our analysis. These interviews were tape-recorded and fully transcribed. We first conducted an infra-case analysis, in other words, an in-depth analyses of cases, followed by inter-case analyses, that is to say pure comparative analyses, which enabled us to identify consistencies between the cases, and to isolate recurring elements that are common to several cases and identify disparities. The interviews were subjected to a qualitative thematic analysis, using Nvivo software to reduce and codify the data. We applied a mixed and rich thematic coding system and performed textual and Boolean searches. We also employed double-coding as a means to check the reliability of our analysis.

5 RESULTS

The first case, Technoplus, involves a French family company with 160 employees specialized in retail of industrial products. In 2004, suffering from fierce competition in its sector, the company decided to improve its customer responsiveness by equipping its technical-sales staff with mobile technologies. Every sales representative was given a Blackberry, directly connected to the company's commercial IS. This technology was presented by management as a means of increasing the employees' responsiveness and productivity, while reinforcing their autonomy and responsibility, as all necessary information was now at their disposal from a distance. The sales manager thus expected the technical-sales representatives to become "autonomous entrepreneurs" in their respective area. The introduction of mobile IT was justified by a climate of urgency and a demand for greater customer-centred involvement. According to the CEO, the technical-sales representatives were largely involved in the development of this technological project. Nevertheless, we should stress that the technical-staff representatives were only allowed to give their opinion on minor aspects of the technological development. Furthermore, the fact that representatives were associated with the technological deployment was used by the CEO as an argument to prevent any resistance from employees. As they had been party to improving the device, they were no longer in a position to resist or express deviant opinions. In fact, mobile IT deployment was unilaterally and rapidly introduced, characterized by a highly directive style of use. Furthermore, initially legitimized by an imperative of responsiveness, mobile IT use progressively turned into an obligation, a duty of efficiency and performance for these representatives. The CEO explained that they had no other choice than to be responsive, available, efficient, and high-performing. Moreover, the introduction of mobile technologies led to some changes in the control methods. Before the development of mobile IT, control methods relied on management by objectives and commission, and was essentially based on trust. The introduction of mobile IT reinforces surveillance over technical-sales representatives, with increased visibility and follow-up, and a normalization and homogenization of behaviours. The discourse deconstruction we carried out for example reveals a metaphor of visibility in the management interviews. Representatives must fill in a sales report in real time, just after their visits. These reports directly inform the sales manager, who knows exactly how many visits have been made by representatives during a certain period of time. The sales manager thus has the possibility to compare the representatives' performances, to identify anomalies and gaps, and to correct abnormal behaviours. This first case thus demonstrates the panoptic evolution of control systems. Mobile IT give the management control over the behaviour of their mobile staff that the company could not manage physically. The technical-sales representatives nonetheless adopt different attitudes to mobile technology, depending on their profile and experience, and have various representations of the underlying changes in control methods. Some uses are in line with senior management expectations, while others are more or less deviant. For example, some sales representatives take advantage of mobile IT to structure and organize their activities; others use mobile IT as instruments to demonstrate to their managers their involvement in the company; on the other hand, the more experienced representatives claim they don't need such tools and deliberately neglect their sales report. In these specific cases, the company management accepts such practices as these representatives are generally good professionals. These disparate uses may reflect adherence to objectives, hostility to organizational goals, or recourse to habits. The case finally shows the capacity of representatives to resist and the identification of sources of satisfaction in a set of social relations that are constrictive by nature.

The second case, ABConstruction, involves a very large French building company (38,500 employees), where a mobile IT project entitled "Sesame" has been developed to improve data management and optimize processes. Site foremen have been equipped with Tablet PCs, directly connected to the company's IS, in order to enter the data relative to the building site directly into the system. The Sesame project enables more reliable and rapid data tracking and is supposed to avoid double entries. The project generates other effects linked to the equipping of site foremen with new mobile IT, such as enhancing their role and repositioning them at the heart of company. Top management moreover relies on these induced effects to promote the project to site foremen who are unfamiliar with new IT. Major discourses around the site foremen's empowerment and role enhancement are developed to promote their acceptance of the technology. A satisfaction survey

carried out among a few site foremen was widely disseminated within the company, for example, to gain the support of other site foremen, and even to generate a sense of shame among those who were on the verge of rejecting the project. This project led to major changes in processes, practices, and control systems. Before the Sesame project, site foremen had to fill in a paper report, which was then transmitted to the accounting services for control and validation. Because they knew there were multiple checks, site foremen didn't usually pay a lot of attention to these reports. Moreover, they were directly supervised by their operators, who regularly visited building sites to check that procedures were respected. Many site foremen would therefore offload their report onto their operators. The company's top management team progressively considered these controls and checks by administrative services and operators as a waste of time and efficiency. As the site foremen's position in closer to the building site, they hold crucial operational information for their company, so management decided to give them the means to enter their data and report directly in the IS. The site foremen's responsibilities and relationships with their operators consequently evolved, as they now had to manage the building site expenses. The technologies at their disposal became "disciplinary" technologies, in the sense that they introduced rigour to the practices and provided a form of distance surveillance. This technological deployment led to a transition from controlling execution to controlling objectives/results (project profitability). The control systems changed from close, direct supervision to self-control procedures for site foremen who were firmly invited to check the data they entered in the system themselves, including the amounts for expenses. The empowerment and greater autonomy of the site foremen thus engenders new obligations and constraints for them that represent an evolution which is at times difficult to accept. As a consequence, the site foremen adopt different attitudes. Some of them seem to appreciate their management team's initiative and feel valued and recognized by the hierarchy. Others tend to resist this organizational change which they consider as a top management initiative that goes against their own identity. They resist through deviant uses of the technology, by making voluntary mistakes in their report for example. Although they are in a subordinate position, they know they hold power (linked to operational information relative to the building site and to their position on the site foremen recruitment market). Such information constitutes resources which make them less disposed to obey. They therefore develop a strategic use of the technology at their disposal and finally manage to overturn managerial intents.

The third case, GammaCom, involves a large French telecommunications company (7400 employees), which decided to install a system to optimize interventions on its telecommunication network sites. Every day, different teams of technicians have to maintain or repair network sites. The new technological system is composed of a smartphone, connected to software which plans the interventions of technicians every day, depending on the needs of the network sites and the localization of the technicians. Every technician is equipped with a smartphone which dictates the list of jobs he has to do every morning and the approximate time he should spend on each site. The software is based on a geo-localization system, which enables the management to know exactly and in real time where the technicians are. Top management argues that this technological deployment should improve the technicians' profitability and security. Nevertheless, the technicians immediately considered this system as a means of controlling their activities. It is true that some problems occurred in certain teams in the past, when technicians were accused of putting their own interests first when planning their interventions, instead of optimizing their round. To solve such problems, the new system makes the technicians follow a given round. This system thus leads to changes in the control systems, which rely on structuring behaviours. Mobile IT appear in this case as direct supervision tools. It's all the more important to note that the management stresses the discipline potential, and uses the notion of surveillance as an argument to structure technicians' behaviours. The upshot of this discourse around potential surveillance is that most of the technicians expressed strong reticence linked to concerns about loss of freedom. They therefore try to take advantage of the technology by adopting different attitudes. Some of them, for example, circumvent the system by switching off the geo-localization device in their car when they want to cut themselves off (at lunch or in the evening for example). Moreover, most of them reinvent the sense of technology and use it as an instrument of proof for their hierarchy, arguing that the technology is a means for them to demonstrate their involvement to their managers, for example. They thus develop a defensive use of mobile devices.

Finally, we should note that such actions lead the technicians to legitimize the technology and underlying control system.

The fourth case, Eurobank Consulting, involves a consulting firm composed of 12 consultants. These professionals work in a context characterized by fierce competition from leading consultancy agencies. A general ambient discourse conveys the idea of urgency and hyper-reactivity in this specific sector, where time appears to be a key resource. In order to increase efficiency and optimize time, the company has moved towards an agile and flexible organizational form. Consultants are increasingly allowed to work at distance, from home, for example, and to limit their movements to visits to customers. Surprisingly, no mobile technologies have been deployed in this company, except in the case of associates who are equipped with modern and sophisticated devices (in a statutory logic). On the contrary, the consultants are generally left to find their own equipment for professional purposes. They are fully aware of the need to be available and reactive. According to the managers, no particular control system exists within Eurobank Consulting. They claim that the company is characterized by an extremely flat management system, absence of control, and a relationship of trust with the consultants. They apply a management by objectives system, so that control is focused on “deliverables” (services provided to customers). In fact, the consultants create their own rules and use a form of self-control. The consultants consider that working outside traditional hours is a moral obligation and they remain available through mobile IT use. Following a long socialization process, they associate specific values with their job of consultant (involvement, responsiveness, discipline linked to time pressures). They finish by accepting implicit organizational rules as their own rules, and believe that they respect values they have developed on their own. In the end, their flexibility and freedom appear to be a disguised form of “coercive autonomy.” This case indicates the emergence of a subtle, invisible form of control via the mobile technologies used and the emergence of a permanent availability. As they consider involvement to be their duty, the consultants construct their own control system via mobile technology which is reinforced by temporal pressure.

6 DISCUSSION

6.1 Unanimous discourse regarding efficiency to recognition of diverse concepts of control

A summary of the cases studied shows the existence of unanimous discourses concerning efficiency and reactivity, which legitimize and justify the introduction of mobile IS in organizations. This discourse gives a dominant place to the notions of liberty, emancipation, autonomy and empowerment of mobile populations, together with a democratization of access to information (especially in the cases of Technoplus, ABConstruction and Eurobank Consulting). There is a counterpart to this culture of transparency, however, as it applies to the individual’s behaviour with efficiency consequently becoming a duty. A Foucauldian perspective provides a counterview to the idea of individual empowerment by showing that the delegation of responsibility generated by these technologies gives rise to new obligations which are just as constricting. Nonetheless, these constraints and, to a larger extent, the issue of control, are often neglected in the discourses. To be more precise, they are exploited in different ways by the senior management teams in the companies we studied. Our cases show the existence of discourse manipulation tactics, illustrating different visions of control and trust, depending on the populations in question. Discourse is thus manipulated to orient individual behaviours (for example, threat of surveillance is upheld to structure the technicians’ behaviours in the case of Gammacom while, on the contrary, the panoptic evolution of control systems at Technoplus is completely hidden behind the official discourses, so as to promote acceptance by the sales representatives, who are used to having a certain amount of power in their commercial area).

6.2 Changes to control systems

One of the main changes to control systems in the cases studied is the emergence of a time-related discipline system, enabling people who are by definition mobile in space and visually ungovernable to be controlled. Through the use of mobile IS, time effectively becomes an instrument for locating people, an organizational norm, and a governance technique. The organization thus uses time to

control individuals who cannot be compartmentalized in space. This shift may be likened to the move towards “control societies,” characterized by continuous control and instant communication (Deleuze 1990). The structuring of mobile populations in space-time leads to different and flexible forms of control, as they adapt to the populations in question through surveillance and bureaucratic control, target-based management and control via the shared values (concerted control). Let’s highlight that the different forms of control enabled by mobile IT, observed in our case studies (bureaucratic control, target-based management, and control via the shared values), correspond to the various disciplinary technologies identified by Foucault himself (hierarchical supervision, normalization, and dressage). The case studies also show a shift in the location of exercise of authority, as individuals take on an increasingly active role in the control process. (Some actors are led to legitimize the technology and underlying control system, while others directly participate to the construction of their own control). Lastly, this analysis enables us to highlight the subjective dimension of control, which depends on the vision that individuals have of their autonomy and control, as well as the use that is made of the technology by the manager. Control depends on the information needs of the activity, and the perceptions developed with respect to the mobile populations in question. These findings explain the emergence of different kinds of control. At the end of the day, technology does not necessarily imply ‘de-bureaucratized’ forms of control, as more subtle forms of control are involved via technology.

6.3 Individual reactions or the importance of power-knowledge relations

The cases studied highlight different reactions and forms of appropriation, identified by applying a Foucauldian perspective. In some cases, individuals develop highly proactive and positive attitudes with respect to technology, whether they are aware of their control potential or not. Self-discipline, the search for a certain degree of satisfaction and equilibrium in the professional and private sphere, and the emergence of personal reflexivity, are all reflections of the trend towards the adoption of technology. Other cases provide us with insights into the resistance of some individuals, with some forms of resistance motivated by the notion of identity and the vision of job function and autonomy. A Foucauldian approach also provides insights into the interactions between the individual, technology and the organization in the framework of a power-knowledge relationship that is highly evolutive, and that should be repositioned in a wider institutional and societal context.

7 CONCLUSION

As mobility becomes a central feature of society, exploring the evolution of control systems in relation to mobile IS is a key issue in the field of management and IS research. It is also a key issue for practitioners in the field of human resource and IS management since it has a direct bearing on change management and the adoption of technologies. Our research shows the relevance of Michel Foucault’s conceptual framework (linking discourses, discipline and ethics) to explore the interactions between IS, the organization and individual actors, particularly from the viewpoint of hierarchical relations and control systems. we need to take a critical look at our research approach given its anchoring in the Foucauldian perspective: this research itself contributes to a regime of truth. We therefore need to emphasize the very relative aspect of the validity of knowledge produced in this study, as well as the highly structuring aspect of its framework discipline. We nevertheless encourage other researchers to broaden the frame of our model and to develop a Foucauldian model applied to IS, which provides a political analysis of technological and organizational change.

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