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Impact of ICTs on leadership practices: representations and actions

Sylvain Leduc
Aix Marseille University, LPS EA 849, 13621, Aix en Provence, France
Laure Guilbert
Psychology Department, Montpellier University, Montpellier, France, and
Gérard Vallery
Department of Human Sciences, Picardie University, Amiens, France

Abstract

Purpose – The purpose of this paper is to present the results of field research carried out within a civil army corps responsible for the security of people and property.

Design/methodology/approach – The study deals with e-leadership as it leadership practices related to information and communication technologies (ICTs).

Findings – Having initially described the position of ICTs in current workplace contexts, the authors review the question of the role of leadership as well as that of knowledge acquired in e-leadership.

Practical implications – The results reveal variations in the use of ICTs in leadership situations, which find their origins in multiple determinisms related to the types of task, the technological tools and the constraints inherent to customary situations.

Originality/value – These conclusions are discussed in the light of research centered on the predictive variables arising from the adoption of technologies in the context of the workplace.

Keywords Information and communication technology, Leadership, Supervisor/subordinate relations

Paper type Case study

1. Introduction

1.1 Information and communication technologies (ICTs) in the workplace

Over the past 20 years, ICTs have considerably grown and been disseminated, to the point where, today, they occupy a predominant role in the workplace and daily life (Valléry *et al.*, 2010). In view of their technical and functional characteristics, in particular their availability and immediacy, ICTs strongly reduce space and time constraints, such that it is possible to access or communicate information no matter where or when (O'Mahony and Barley, 1999); spatio-temporal proximity is no longer a sine qua non-condition for the interaction of several users. ICTs also allow exchanges to be increased and the number of actors providing new collective work practices (Peyrat-Guillard and Samier, 2003; Détienne *et al.*, 2010) and contribute to the improvement of customer relationships (Navarro *et al.*, 2001).

Several studies (Marchandise *et al.*, 1999; O'Mahony and Barley, 1999; Bérard, 2002; Stone *et al.*, 2007) note that these technologies have an impact on:

- The characteristics of tasks, both in terms of their resolution, for which the agent has a greater volume of structured but more complex information at hand, and in terms of decision making, which is often needed very quickly. For example, nearly

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81 percent of managers are of the opinion that ICTs create a sensation of urgency (Microsoft, 2003; Guilbert *et al.*, 2010; Bobillier-Chaumon and Dubois, 2007).

- The competences which are mobilized, such that the mastery of such technologies becomes an undeniable performance benefit, but also a factor of inefficiency when they are unavailable (Brangier and Valléry, 2004).
- Interpersonal relationships, created through the strengthening of requirements for network collaboration, and the accessibility of individuals whatever their status within the organization; concerning the latter, managers have widely diverging views since only half of them declare that work relationships are simplified. Nevertheless, nearly 80 percent consider that ICTs modify the way in which employees are managed, leading not only to a greater degree of information flow transversality, but also to strong mutual dependence associated with closer coordination within the organization (Microsoft, 2003; Kocoglu and Moatty, 2010).

1.2 The supervisory relationship: management, command, leadership?

Yukl (1994, p. 38) defined leadership as "an influence process affecting the perception of events by those who follow the leader, the choice of group objectives, the organization chosen to achieve these objectives, maintaining cooperative relationships within the work team, and the involvement of persons from outside the group and the organization, in terms of support and cooperation."

Currently, two forms of leadership as distinguished (Andriessen and Drenth, 1998; Burns, 1978; Avolio *et al.*, 1999; Sashkin, 2004):

(1) Transactional leadership, characterized by a directive mode of management based on: reward/punishment, assigned to the subordinate in accordance with the objectives set by the hierarchy and which he/she has or has not achieved. This practice depends on the status, the function or the title of the superior.

(2) Transformational leadership, which makes use of participative management based on the delegation and recognition of the subordinates' needs. The latter tend to concentrate on tasks they have been assigned, rather than on their personal interests. This leadership practice relies on the competences and personality of the leader.

In fine, the transactional leader is found to be more efficient in a predictable situation, whereas the second is more appropriate in a context of uncertainty (Gendron, 2004; Gendron and Lafortune, 2009).

Nevertheless, these studies do not clearly distinguish between the institutional or informal position of the leader (Stogdill, 1950). However, the manager can influence the subordinates as a consequence of his/her status in the institution, whereas the leader has an informal influence on the members of the group, without having any official hierarchical status. In the first case, the authority has a legitimacy resulting from the person's status and role, if he/she is a superior. In the other case, the authority relies on the person's personality, which can make the person in charge a leader. Moreover, leadership also results from interactions between the hierarchy and the group, defined by rules of authority which must be respected. The superior's role is then to make important decisions, determining the manner in which the subordinates' objectives must be coordinated (Albou, 1975). Finally, in practice, leadership' behaviors affect the organization of work, group interactions or operator involvement (Montmollin, 1984).

Lastly, it is possible to distinguish two leadership practices, command and management, the implementation, basis and leadership style of which can be differentiated (cf. Table I).

1.3 The exploitation of ICTs in management: e-leadership

Depending on the functionalities made available and services rendered to the users, ICTs can question the rules of "theatrical" unity of work (Zarifian, 2004), which are:

- the unity of time, which is subjected to the discipline of working hours and productivity in the accomplishment of tasks;
- the unity of location, in which the operator is assigned to a position in a workshop, in order to carry out a given operation; and
- the unity of action, required in order for a group to collectively carry out certain tasks.

This new technological context, which is a source of virtual work (Cascio and Shurygailo, 2003), leads to a dramatic change in the implementation of leadership, which is then qualified as "e-leadership" (Zaccaro and Bader, 2003). Some research work has taken an interest in this, either in terms of the impact of new technologies on the implementation of leadership, or by studying virtual working teams which unite geographically and/or organizationally dispersed individuals who collaborate via ICTs in order to achieve specific objectives (Zigurs, 2003). E-leadership designates a process of social influence, mediatized by information technologies in order to produce a change in attitudes, emotions, thoughts and behavior and/or individual, group and/or organizational performance (Avolio and Dodge, 2000). Among the noteworthy associated elements, these studies mention:

- the evolution of the nature of workplace exchanges, which are more strongly centered on tasks than on relationships (De Rosa *et al.*, 2004);
- the mobilization of specific competences in order to master technologies (Pulley *et al.*, 2000);
- the need for face-to-face exchanges in order to maintain "remote" confidence (Pulley and Sessa, 2001);
- the e-leader's implementation of interactive behavior in order to ensure the availability of tele-presence to the group's members (Zigurs, 2003);
- the planning of process evaluation, accountability, and task and task limit sharing (Cascio and Shurygailo, 2003); and
- the need to manage employees by means of objectives, rather than as a function of the tasks accomplished or the number of hours worked (Cascio and Shurygailo, 2003).

Table I.
Distinction between different forms of leadership

Type of leadership	Command	Management
Function/method	Authority	Participation
Basis	Function, status	Competences, charisma
Leadership style	Transactional	Transformational

Consequently, even when the dissemination of ICTs in the workplace has benefits in terms of productive and organizational efficiency, it appears to make the employees' work more complex, and to have an influence on the leadership relationship. Indeed, concerning the latter point, the studied literature attempts to cast light on the causes, through enquiries centered on declared implemented practices (Rogard, 2004), but does not address the question of effective in situ practices related to the use of these technologies. As for recent research into the work practice of executives, either they evoke leadership practices without analyzing the mobilized tools (Langa, 1996), or they deal with the declared use of ICTs, without taking into account the influence of leadership in the workplace situation (Guilbert and Lancry, 2005).

2. The issues

The literary review presented in the introduction emphasizes the relevance of investigating leadership practices related to ICTs, in order to define, on the one hand the causes, and on the other hand the interdependent links between practices of influence and the use of technologies. In response to this preoccupation a study has been made of an army corps working in the civilian world, the French Gendarmerie Nationale (national military police force), because:

- leadership practices are defined by formalized and structured rules, via a clear distinction between superiors and subordinates; and
- ICTs are extensively used in the workplace.

From the operational standpoint, this research is structured around two questions:

(1) What are the leadership practices in the Gendarmerie, as a function of foreseen or unexpected workplace contexts? What type of leadership do they depend on?

(2) What is the role of ICTs in leadership practices, according to these situations? What is their influence on the exercise of leadership and the associated forms of leadership?

The formulated hypotheses are as follows:

H1. In agreement with the studies made by Gendron (2004), it is our opinion that the leadership practices of subordinates correspond to transactional leadership in known and planned situations, whereas in situations of unexpected events, transformational leadership dominates.

H2. Considering the studies of e-leadership of Avolio and Dodge (2000), we make the hypothesis that ICTs reinforce leadership practices characterized by the centralization of a given task, with interpersonal relationships being neglected, as well as by the management of subordinates by means of objectives, rather than through missions to which they are assigned.

To summarize, it is proposed in this study to cast light on the determining factors of leadership activities, disseminated by technological tools, as well as their effects on subordinates, by investigating the characteristics of workplace situations.

3. Study situation and methodology

3.1 Population and situations

Our investigation took place with 38 gendarmes, working in regional Gendarmerie stations located in the north of France. The sample includes 18 "leaders" (officers and

non-commissioned officers assuming the roles of captain or deputy captain), and 19 "subordinates" (non-commissioned members and non-commissioned officers with no leadership role).

The dispersion of characteristics of the studied population, together with the small number of individuals, does not allow causes related to individual variables to be revealed.

The terrain on which the enquiries were made includes regional brigades responsible for the 24-hour surveillance of one or several communities in a rural or peri-urban setting, as well as dealing with the public (Matelly, 2006; Clément, 2003.). Each brigade is placed under the orders of an officer in charge of six to 40 subordinates, whose work varies between that of external services (judicial enquiries, security meetings and surveillance patrols in the field) and services provided by the brigade (recording of complaints, auditioning of victims, drafting of enquiry reports). The mean weekly work duration is 45 hours, to which day and night duty and standby duty at the casern must be added. From the organizational point of view, priority is given to the handling of unforeseen events, with the execution of planned tasks playing a secondary role.

3.2 The ICTs used

In a Gendarmerie, among the co-existing ICTs one can find:

- two telephone systems full-duplex, one being a landline at the brigade, the other being a mobile GSM service;
- an internal data transmission system (Rubis messaging system) and voice transmission system half-duplex (Rubis phone) by airwave;
- an intranet/internet network providing access to databases or specific message applications; and
- electronic messaging tools dedicated to each agent (interpersonal messaging service) or to the entire brigade (station messaging service).

The following table (cf. Table II) summarizes the characteristics of the technologies at the focus of our study, and describes their main functionality, the associated type of use, the type of exchange induced and the place of use.

Interpretation of this table shows that some tools, as landline telephone, GSM or Rubis phone, have identical functionalities to communicate, but differ with respect to their modes of use or exchange, or even the place where they are used. For example, the landline telephone or GSM are not only synchronous, but also duplex systems, meaning

	Functionality		Use		Type of exchange		Place of use	
Technology	Inform	Communicate	Oral	Written	Synchronous	Asynchronous	Station	Field
Landline phone		X	X		X		X	
GSM		X	X	X	X	X	X	X
Rubis phone		X	X	X	X	X	X	X
I/S messaging service[a]		X		X		X	X	
Rubis messaging service	X			X		X	X	X
Intranet, internet	X			X		X	X	

Note: [a]I/S messaging, = interpersonal or station messaging; X, indicate the availability of the characteristic

Table II.
Characteristics of the technologies used in the departmental "Gendarmerie" police force

that both parties can talk at the same time, and be mutually "received." This could be a very strong advantage over a simplex radio communications ICT like Rubis, since a "conversation" with this type of device implies that user "A" transmits his message while pressing the transmit button. During this time user "B" must be in standby mode (not pressing the button on his radio) and listening. He must then wait until he is sure that "A" has finished speaking, before answering, using the same protocol. This requires care, can be slow, and can lead to confusion or loss of information if both "A" and "B" try to speak at the same time. To these aspects, one must add the context of evolving technologies in which new tools sit alongside older ones, which have a lower performance or poorer transmission security.

3.3 Methodological approach: advantages and limitations

From the methodological point of view, and in view of the issues arising from ICT leadership at stake, our investigation was made at three different levels:

(1) concerning the effective practices within the institution, in order to identify the forms they adopt and the objects on which they are based;

(2) concerning the ICTs mobilized in the work situation, with the aim of quantifying their use and indentifying the associated objectives; and

(3) to determine the influence of these tools on these practices.

To achieve these objectives, the approach used in the enquiry is based on the ergonomic analysis of the operator's work, associating three approaches to information collection:

(1) Semi-directive types of interview, carried out with all of the observed subjects ($n = 38$): this technique (Berthier, 1998) combines a non-directive attitude, in order to favor the exploration of thoughts, with a directive approach, in order to extract information on previously defined points.

(2) Observations of all agents in the workplace, for one day per person ($n = 38$): this approach, involving the "paper and pencil" recording of observations, allows attention to be paid to clearly defined, intensively examined situations, with the aim of determining real practices, recording the context in which they develop, and taking the actors' verbal work and behavior into account (Arborio and Fournier, 1999). Here, the agents' behaviors in interpersonal work relationships, and in their use of ICTs, constitute preferred observables, which are used to describe workplace situations. In parallel, an observation grid is used to make specific note of data related to the use of ICTs. For each observation situation, a detailed record is produced, in which the completed actions are presented.

(3) Verbalizations: this involves the recording of verbal exchanges, expressed in a natural form, related to the behavior and mental operations implemented in the work situation during the execution of a task (Caverni, 1989). These verbalizations are either simultaneous with the execution of the task, or consecutive, in order to avoid interference with the work process.

The choice of these different methods is guided by their complementarity. The association of observations and verbalizations allows both aspects of the activity to be described: recording of the observable reality of the action, and the interiorized experience of the actor (Guérin *et al.*, 1997; Clot *et al.*, 2001). In the ergonomic approach focussed on real work situations, it is important to confront the facts vs the experienced

workers, because behaviors' observed are partly founded on actors' representations of the work situation.

4. Results

4.1 Leadership of men

All leaders recognize that the way they lead has evolved over the last 20 years. The difference, according to them, arises from the manner in which the "human" dimension of subordinates is taken into account. Previously, orders had to be executed by subordinates without being questioned ("That's how it is, there's no choice in the matter. The captain decides."). This no long appears to be the case today, according to the leaders ("[…] in the decision-making, a discussion takes place between the superior and the subordinate." "It is not by being a hard commander that you achieve anything […]," "Although the subordinate is not in command, asking him/her for his/her opinion makes it possible to evolve and to adapt one's commanding role."). This perception is confirmed by the subordinates, who add that "the superiors ask the subordinates more easily for their opinion."

During the observations, we noted several indications tending to confirm this change. Consideration for the subordinate can thus take several different forms, such as:

- a discussion of orders, in the form of a debate with the captain;
- specific attention to aspects of the subordinate's life outside work, through specific questions ("will you be free this weekend?"); and
- a constant search for feedback ("do you agree?," "have you understood the objective?," "what do think about it?").

Each of these forms of work conduct, as practiced by the leaders, corresponds to a leadership relationship, which distances itself from military culture and comes closer to that more generally observed in companies. Described by some leaders as "participative leadership," this consultation with subordinates is more frequently associated with MSR and OSP missions than those related to CIO. It is thus possible to distinguish between an "everyday" business leadership relationship, involving a participative command specific to transformational leadership, and a leadership mode dedicated to field operations characterized by a directive form of command, suggestive of transactional leadership.

Participative command, which is similar to management, is used for recurrent tasks for which the subordinates possess some of the elements needed for their execution. In concrete terms, this has to do with the daily management of the station, and in particular of the personnel and the physical equipment, in order to ensure its correct operation. In this case, the captain "needs to understand the whys and wherefores of the subordinates, and to obtain their support."

As for traditional leadership, this is directly inspired from military culture and is useful in dealing with unforeseen events requiring rapid decision making, followed by virtually immediate execution. The orders which are handed down contribute toward interpersonal coordination and efficient collective work. Here, as expressed by one leader, there is "no discussion, no debate." The following observational account reveals the work of a company commander responsible for organizing the interception of suspects, by ordering the subordinates to carry out certain actions (search for information, transmission of information to other gendarmes in the department), while traveling to the location where the misdemeanour took place. Here, ICTs are mobilized in order to maintain contact with the subordinates who remain with the brigade and

ensure that communications are maintained with the other colleagues in the field, who are searching for the criminals.

Observational report on the management of a command of interventional operations task:

> On the 05/12/2008, three armed and hooded men penetrated into the home of a scrap-metal dealer, sequestered him and stole his money. They then escaped. The victim succeeded in freeing himself and alerted the Gendarmerie. The telephone call was received by the gendarme on call, also referred to as the "orderly". He transmitted the orally received information to the captain of the brigade, who travelled directly to the scene of the crime. From that moment onwards, the leader took control of the operations, collecting field information from the scrap-metal dealer, in particular concerning the criminals, which he re-transmitted to the orderly. He decided to organize a "Hawk Plan", to cover, compartmentalize and partition the department in order to increase the chances of locating and intercepting the suspects. To do this, he gave several instructions via the orderly, who used the Rubis phone technology in conference-mode. This functionality disseminates information, taking priority over all other current exchanges, and allows all of the department's Gendarmerie radio stations, both in stations and vehicles, to be addressed simultaneously. The captain thus gave the order for patrolling units to converge at strategic points of the main highways, and mobilized the gendarmes still in the brigade to search for information on the fugitives. He also contacted other departmental brigades in order to coordinate operations and relay information. In parallel, he questioned the brigade orderly using the GSM telephone, in order to collect additional data resulting from the requests submitted to the information system, concerning the identification of the suspects' vehicle.

These two subordinate leadership modes are complementary, since it is through daily discussions with the agents that it can in some situations be possible to limit exchanges, and to carry out the orders given by the hierarchy. Nevertheless, there is a prevalence of directive leadership, specific to institutional tasks, in which "the event controls the action," as related by one of the leaders. Any form of daily task planning can thus be put into question. In the end, it appears that two leadership styles co-exist, according to the circumstances in which the leadership is exercised; a transformational type of leadership is implemented in the GRU and OPU, for which it is important to recognize the specific needs and expectations of each agent, whereas during DOI tasks, transactional leadership is generally imposed; the consequences of disobeying an order then taking the form of a sanction.

4.2 E-leadership: the impact of ICTs on the exercise of command

a. Top-down communication. All of the leaders we interviewed agreed that the way in which they transmit orders has not changed as a result of the introduction of ICTs. The service note and messages are transmitted by electronic messaging. This is the most frequently used tool, whenever the information to be transmitted has no urgency. Some orders are nevertheless given orally, preferably person-to-person, or via the landline telephone, the GSM or the Rubis phone when the subordinates are in the field. These means of communication are used mainly when the gendarmes need to control an event, in which case the order is not written down. The received order is described only in the service report. As stated by the captain, "Orders are given by telephone," or "person-to-person." "The ICTs are there to formalize directives." Synchronous modes of communication are preferred because they allow instantaneous feedback. It should also be noted that the leaders consult the subordinates face-to-face when they need information relevant to the unit (service bulletin, etc.). Our observations show that orders are seldom transmitted by means of asynchronous ICTs. This situation is

explained by one of the leaders in the following: "Orders are perceived differently, depending on the means by which they are transmitted. A service note has an official tone, whereas an e-mail is different, one knows that the message will require an effort, thinking, writing, working, but that there will be a certain degree of flexibility, it is not standardized. An email reply will be less formal."

Consequently, depending on the type of order to be transmitted, the means of communication will vary. Official orders will be sent via the unit messaging system and are sometimes reproduced by post, depending on their importance, whereas individual orders will be sent to the person concerned using the interpersonal messaging system. The means of communication used to relay an order will also have an influence on the time needed for the request to be dealt with. When a leader speaks with a subordinate over the telephone, the request is dealt with more rapidly: the use of the telephone suggests a higher degree of urgency than that associated with electronic messages. Moreover, when an unforeseen event has to be dealt with, oral means of communication are used preferentially, as shown in Figure 1.

Here, ICTs are used several times, for relatively short periods of time, since the requirement is to provide a fast and efficient solution in a very short space of time, and to report on the event. The choice of ICT is based, above all, on its operational usefulness with respect to the task to be accomplished. This unplanned work situation requires an interpersonal collaboration characterized by reactivity, which is made possible by synchronous technologies. Appropriate coordination of the various participants' actions, to deal with an event which occurs "hic and nunc," directly conditions the efficiency and performance of the gendarmes' intervention in the field.

b. Ascending communication. During the interviews, the leaders discussed the use of electronic messages by the subordinates. These technologies allow subordinates to contact the person who is most able to reply to their request, without respecting the complete hierarchical structure. As a consequence, the leaders we questioned view ICTs as a means by which the superiors have become more accessible to the subordinates. Moreover, they have observed an increase in the volume of exchanges with the latter. A leader explains this in the following terms: "One can consider that people have become more accessible. It is possible to contact one's superior, and the superior tries to provide an answer, one can be inclined to communicate to a greater extent." Another superior added that: "People feel less restrained when communicating

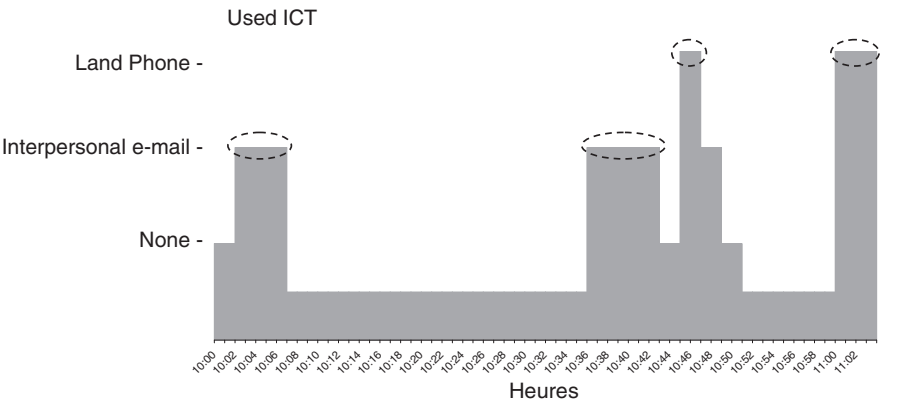

Figure 1.
ICT's used by a leader for the transmission of orders when managing an unforeseen event

with their superior. The superior cannot avoid being accessible. Contacts are facilitated and we are solicited far more frequently than before." This perception is more subtly perceived by the subordinates, for whom ICTs facilitate, above all, the transmission of orders and information by the hierarchy.

Ascending communication is also reinforced, on the one hand as a result of the wide dissemination of information, in particular through the use of the unit messaging system, and on the other hand because information can be accessed via the internet or intranet, technologies which are shared by all of the agents, irrespective of their hierarchical status. The leaders now need to request the subordinates to search for information, in order to maintain a clear picture of a given situation. As stated by one leader, "[…] Previously, we were informed about everything. Today, the superior can no longer establish his/her authority over information. Before, I was the first to know. Now, the information is shared, and sometimes I am even the last to know."

To summarize, it now appears that ICTs thus put the role of possessing information into question, in the exercise of authority and highlight the importance of respecting the hierarchical approach to command.

c. The pernicious effects of ICTs on the agents' work. A leaders work cannot be carried out linearly; interruptions are frequent, and originate either from the activation of technologies (telephone ring tone, incoming e-mail alert tone), or from the direct solicitation of a subordinate. This phenomenon of fragmented real activity is not enjoyed by the superiors we questioned. One of them made the following statement: "It is stressful because we can see that we are unable to do our work, because we are interrupted all the time. We are solicited all the time, at the end of the day it feels like we have achieved nothing." There is also greater pressure to respond to messages more quickly.

Moreover, they have the feeling that their activity is being permanently monitored:

- for the subordinates, this impression arises from the presence of intranet technologies, because their movements on the web are recorded, using the identification required when they log on; and
- for the superiors, it arises from their obligation to report on the unit's production and the real-time management of an event to their hierarchical superior. A captain summarized the situation as follows: "We can no longer do much, because our activities are permanently monitored."

ICTs, which contribute toward a reduction in the latitude for autonomy perceived by the agents in their workplace, can thus provide a degree of freedom in the daily evaluation and solving of problems.

5. Discussion

The analysis of ICT use by the gendarmes shows that their implementation depends on several factors related to the technical characteristics of the ICTs, the constraints inherent to their various work situations, the objectives associated with the tasks to be carried out, and the nature of the information to be transmitted; all of these elements relate back to the usefulness or usability of these tools (Grudin, 1992). Such concepts, which are considered in a functional and instrumental approach to ICTs, in the definition of the ergonomic quality of technical systems, are inadequate when accounting for the psychological processes which condition the adoption of one form of technology in favor of another. According to Dubois and Bobillier-Chaumon (2009), other factors

and dimensions intervene in the manner in which users evaluate and appreciate the advantages of using a particular device, above and beyond its functional properties. Indeed, the choice of a device depends largely on the perception of its usefulness and simplicity of use (Colvin and Goh, 2004). These variables, together with other psychosocial factors such as social influences, social norms or even self-image, have a major influence on the acceptance of a given technology. Nevertheless, in the work situations we studied, ICTs are used taking into account the psychosocial issues, which are placed in a temporal perspective characterized by work phases involving a more or less confirmed degree of urgency. To this, one must add the constraints imposed by the professional universe, which lead to situations of subordination in which an agent cannot easily refuse to use a given tool, without violating instructions. Moreover, Benedetto-Meyer and Chevallet (2008) underline the fact that it is necessary, on the one hand to reposition the issue of the acceptability of ICTs in the social, organizational and symbolic context of their use, and on the hand to study their use in terms of a form of social, individual, organizational and collective construction.

As for leadership practices, in relation to ICTs, it appears that the use of electronic forms of communication is not neutral with respect to leadership performance. According to Reeves and Malone (2007), the use of technical devices can potentially lead to an improvement. This point can be verified whenever the ICT used is well adapted to its intended purpose. Indeed, the field enquiry shows that the choice of ICT takes into account, not only the temporal urgency, but also and above all the need for coordination defined by the leaders. Leadership efficiency then depends on the ability to switch between the use of different synchronous and asynchronous communication tools (Toulemonde and Garré, 2010). This ability to organize different levels of communication should be compared with the relating quality, as it is described in the model defined by Sloan (1963). This author also indicates that a sensemaking ability is essential. However, since ICTs make information available and accessible to all, the leaders need to be able to explain, convince or obtain acceptance. All of these competences call for abilities, beyond those of leadership based on a status of authority.

Nevertheless, this aspect needs to be put into perspective in this research. Indeed, even though the evolution of command in the Gendarmeries is mentioned by most of the superiors we questioned, they attribute this effect to evolutions in the civil society and to changes in the structure of the Gendarmerie. Far more importantly than ICTs, the evolution of mentalities in civil society and of the subordinates' motivations for joining this military organization, coupled with internal evolutions such as the professionalization of the army and the obligation of results, appear to have multiple repercussions on this institution, in particular in terms of leadership. An officer summarized this in the following manner: "ICTs are not responsible for the evolution of command towards management. The Gendarmerie is open to the technology of civil society, which itself turns to the military institution in order to understand their techniques (how to federate a team, etc.). The transition from command to management is due rather to the evolution of civil society, to the need for the Gendarmerie to adapt itself to the newly recruited gendarmes."

However, ICTs have contributed to an evolution in requirements, in terms of workload, through its intensification, and the objectives of production, through the reactivity which is expected, and this is the case for leaders and for subordinates. However, for them to be acceptable and bearable, these changes in daily work rely on flexibility in leadership, in particular by introducing the employees' participation in the exercise of command (Vendramin and Valenduc, 2002). In the end, this amounts

to a change in the paradigm of influence, which shifts from submission to authority (Milgram, 1963), a characteristic of command, to freely consented submission to management (Joule and Beauvois, 1998); in the latter case, the subordinate has the impression that he/she is an actor in his/her work and not a subordinate agent at the service of the hierarchy.

6. Conclusion

As a result of this research, it appears that the use of technology is determined by the combination of three factors: first, the nature of the task to be completed (collect information, transmit directives, enter data into a database, etc.); second, the inherent capabilities of the available technologies (speed, autonomy, cost of use, etc.); and finally, the situational constraints (urgency, place, temporal context).

As for the leadership of men and women, this evolves as a function of the programmed or unexpected character of the task to be completed. This result is in contradiction with the hypothesis formulated on the basis of the studies of Gendron (2004). This outcome can find its explanation in contextual elements, which are specific to the Gendarmerie. It has to do, on the one hand with the military culture, in which interpersonal relationships are based on submission to authority – indeed the leaders prefer to consider their practice as a form of participative command, rather than one of management – and on the other hand with the characteristics of the operations the agents have to deal with; the security of material assets and people has vital consequences, which rely on the implementation of only one decision, and the assumption of responsibility.

As a consequence, the efficiency of the adopted mode of leadership depends on the situation (Hersey *et al.*, 2008). This also makes the assumption that the leaders have the ability to adapt to the contextual elements. This point then raises the issue of the role of professional competences, and more exactly their nature. It is thus one of the limitations of this research, which does not delve into the individual variables, as personality's factors, ICTs' skills, which come into play in this context (Giuri *et al.*, 2008).

Then, concerning the role of ICTs in the workplace, it is found that more time is allocated to the use of asynchronous ICTs: this observation is directly related to the nature of the mobilized cognitive processes; reading requires more processing time than a verbal exchange. Thus, in situations of uncertainty where the primary requirement is for interpersonal coordination, synchronous tools are preferred. To this, one must add the constraints inherent to common situations, in particular that of the nomadic characteristics of some tasks. These conclusions confirm the nature of the structuring variables in the work practice of the leaders, and also of the subordinates, with the usefulness of an ICT being defined at the crossroads of the task to be carried out, the specific functionalities of the tool, and the characteristics of the situation to be dealt with.

Concerning the use of asynchronous ICTs, this corresponds to a task in its own right, which is related to the other tasks carried out by the agents. As such, this task thus competes with the consumption of time resources available during a working day, which explains why, depending on the individual's status (superior or subordinate), it is possible to devote more or less time to its use. In the case of leaders, the time spent using asynchronous technologies, in particular reading electronic messages, is varied according to the consultation strategy (superficial or in-depth) used. At this stage, individual variabilities are encountered, which are perhaps related to the agents' competences.

In their role as leaders, the superiors choose technologies, while taking their impact on the subordinates into account. Written asynchronous ICTs are thus designed to

reinforce the official character of the information transmitted; they create a record of the orders, which remain in place over the medium to long term, and which the subordinate cannot ignore.

Conversely, oral synchronous ICTs serve a short-term purpose, for which the subordinate must respond by immediately executing the order. The hypothesis which predicts a form of leadership centered around tasks, to the detriment of the men and women as a result of the use of ICTs, is thus partially validated since in this case there is an induced modulation, due to the inherently uncertain nature of some work situations the gendarmes are confronted with.

As for the hypothesis, which predicts the management of subordinates by objectives, rather than by initially defined missions affected by ICTs, this is verified since situations of uncertainty are the general rule in the Gendarmerie. In such situations, synchronous ICTs play a central role by enabling interpersonal and collective coordination, when an unforeseen event must be dealt with. Nevertheless, a "migration" of this function toward asynchronous ICTs is observed, in which the superiors transpose the instantaneous response times of machines onto their men.

Nevertheless, these results have limits, which result, in particular, from the limitations of our methods, especially the impossibility of our continuous presence in the field to observe common practices. It is important to understand that the variability of ICT use in command situations is directly related to the events the superiors need to deal with. Although it is for the occurrence of unforeseen events that it is important to be prepared, in order to be sure of including such phases in the sample of observed situations, it is still necessary that such unpredictable events occur, and that our presence be authorized, in view of the possible dangers which could be encountered. The use of ICTs is not dictated as such by pre-established instructions, according to a well and previously defined program, since it depends above all on the necessities of production, in terms of information and communication; they are simply means, at the disposal of men and women who need to accomplish tasks. We are thus of the opinion that other technical factors (reliability of the operation of these tools), economics (cost of use) and cognition (ergonomics of systems), also need to be taken into account.

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Corresponding author
Sylvain Leduc can be contacted at: sylvain.leduc@univ-amu.fr