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RFID-enabled process capabilities and its impacts on healthcare process performance: A multi-level analysis

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New lenses to investigate media use: the layering process perspective

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Abstract

Managers spend much of their time communicating and use an ever-larger range of communication tools for the purpose. Empirical studies have shown that while ICT tools extend communication opportunities, they do not replace other means of communication. Instead, managers use a set of communication tools in which traditional media coexist alongside ICT tools.

In addition, studying the use of just one medium fails to give us a full picture of managerial communication. To gain a better understanding, we need to examine how a range of different means of communication are used.

To this end, we conducted a case study in a car manufacturing company with data mainly collected through interviews with 36 managers. Our analysis of the data showed that managers use a set of communication tools that form superposed layers, each new ICT being layered over the existing media.

Far from being the result of individual-level rational use, this layering process is socially constructed by the different users depending on their context. Our study identified three forms of layering, namely "subject to constraint", "planned and emergent", or "chosen". We argue that these differences in the layering process can help explain disparities in the outcomes of ICT adoption between organisations.

Keywords: Napoleon effect, Layering process, electronic mail, case stdy.

Managers spend a large part of their time communicating, and the range of communication tools they use is growing (Te'eni, 2001). However, they are also short of time and need to manage "time famine" (Perlow, 1999, p.57). As information and communication technology (ICT) applications should enable them to reduce traditional lag time in theory, the use of such tools appears to be a crucial factor for managers' success. In addition, companies have invested massively in ICT applications in the hope of benefiting from their communication capacities (Watson-Manheim and Bélanger, 2007). Their outcomes, however, differ significantly between organisations.

The growing use of ICT applications raises the question of whether or not they replace traditional means of communication (face-to-face, meetings, telephone, etc.). Several studies have explored the issue from a perspective of both complementarity and substitution (Crawford, 1982; Culnan and Markus, 1987; King and Xia, 1997). The results, however, have been contradictory. In contrast, the co-existence of different means of communication that form superposed piles has been noted (Boukef Charki and Kalika, 2006). There is a layering process through which each new ICT tool is layered over the existing media. Kalika (2002) proposed the concept of the 'Napoleon effect' to describe this layering process. In baking terms, a Napoleon (also known as a cream slice or *millefeuille)* is a cake in which pastry, cream or custard, and fondant icing are stacked in layers. A Napoleon is therefore made

up of a number of layers of different ingredients. The Napoleon effect refers to the superposition of different layers of media. As all media coexist, each new medium is superimposed over the existing ones and thus form the Napoleon effect.

In this paper, we have attempted to further our understanding of the Napoleon effect by examining the use of e-mail, meetings and telephone. Fast becoming ubiquitous (Rice & Gattiker, 2001; Van den Hooff et al., 2005), electronic mail is used to communicate quickly and instantly without worrying about the availability of the recipient (Straub & Karahanna, 1998). Communicating electronically therefore allows greater time management flexibility and would appear to entail fewer constraints than meetings or phone calls. Studying the use of e-mail in comparison with meetings and phone calls is therefore of interest to both academics and managers.

We begin by discussing our theoretical development and describe our research methodology. We then present and discuss our results. The paper concludes with our contributions and areas for further research.

1   THEORETICAL DEVELOPMENT

Comparing the uses of new ICT media and traditional ones is a fertile research area (Watson-Manheim and Bélanger, 2007). We first point out the shift from studying a single medium choice to the management of a set of communication media. We then discuss how the layering process perspective can bridge the gap between existing theories.

1.1   From a choice of medium to management of a set of communication media

Several theories have been put forward to explain how and when a medium is used. Theories on media use are often either single medium theories or multiple media use theories. Most of these theories focus on a single medium choice (media information richness theory, channel expansion theory); few have looked into multiplicity of media use. These theories have been formulated only recently and are not yet well documented.

1.1.1   Single medium choice theories

Single medium theories focus on why a medium is used. Different theories, among them information richness theory, have attempted to account for the choice of medium. This theory provides a rational choice explanation with respect to the individual's choice of medium (Daft and Lengel, 1984; 1986). Its conclusions have been called into question by many researchers, however. Initially formulated for traditional communication, its application to ICT applications such as e-mail is controversial. In addition, information richness theory offers little explanation of e-mail use (Van den Hooff, 2005). Indeed, the ability of the medium to overcome temporal and spatial constraints and the individual user's experience with e-mail are often more influential in the choices made. In addition, e-mail use may be motivated by the need to overcome spatial and temporal constraints without concern for the content of the message and its ambiguity (Dimmick et al., 2000; Van den Hooff et al., 2005). While proximity fosters face-to-face communication (Fiol and O'Connor, 2005), e-mail use is often justified by distance (Rice and Aydin, 1991; Straub and Karahanna, 1998). The choice of medium conveys a symbolic meaning, independent of its objective features.

In an extension of information richness theory, the symbolic interactionist perspective (Trevino et al., 1987; 1990) integrates situational constraints and symbolic considerations. At the same time, channel expansion theory (Carlson and Zmud, 1999) highlights the importance of experience. These extensions have improved our understanding of e-mail use while remaining rational choice theories made at individual level. However, these theories cannot explain the fact that two groups with the same context differ in their use of means of communication (Zack and McKenney, 1995).

Fulk et al. (1990) make the assumption that both sense-making and behavior are subject to social influence. Choice of medium relies on a subjective rationality influenced by colleagues' behavior,

experience, and group standards. This means that e-mail may be used even if there is no correlation between the communication content and the objective characteristics of the medium. This choice may be considered rational by group norms of communication even though it does not correspond to the effectiveness criteria identified by information richness theory (Fulk, 1993). Markus (1994) shows that social definitions relating to e-mail use can be different from those envisaged by information richness theory. Users conform to social standards in determining the behavior to adopt, which implies that their personal choice is limited.

Thus, single medium choice theories have provided different explanations for the choice of medium. Medium use is explained not only by contingency factors but also by situational factors and social influence. Besides, many studies have demonstrated the complementarity of these factors (Wijayanayake and Higa, 1999; Webster and Trevino, 1995; Trevino et al., 2000; Kraut et al., 1998; Van den Hooff et al., 2005).

Still, users are not confronted with the exclusive choice of just one medium, but rather with managing a set of communication means. In this sense, Dennis et al. (2008) argued that communication performance will be improved when individuals use a variety of media to perform a task rather than a single medium. Moreover, studying the use of a single medium cannot give us full understanding of users' communication. So, recent research has looked into the use of an array of communication media.

1.1.2   *Multiple media use theories*

Since managers use a range of communication tools, we focus on multiple media usage (Bélanger and Watson-Manheim, 2006; Massey and Montoya-Weiss, 2006; Watson-Manheim and Bélanger, 2007, Lee et al., 2007). Multiple media use theories focus on the management of an array of communication media to accomplish a specific task. The studies that have investigated multiple media use are summarized below (table 1).

Authors	Multiple media use focus
Massey and Montoya-Weiss (2006)	They distinguish between the use of a single medium at a time and the use of multiple media concurrently. They suggest that media utility influences media selection and use.
Bélanger and Watson-Manheim (2006)	They distinguish different forms of multiple media use combinations which can be sequential (two or more media used over time) or concurrent (two or more different media used at the same time).
Lee et al. (2007)	They study the notion of a communication portfolio, "a set of ICTs that organization members can use for communication" (p. 135). The communication portfolio can be characterized by its size (the number of ICTs used), its content (specific ICTs used) and its structuring mechanisms (how the different media are used). The authors focus on three structuring mechanisms, which can be sequential, concurrent, or repetitive (the same ICT is used more than once).
Watson-Manheim and Bélanger (2007)	They propose the communication media repertoire, which is "the collection of communication media and identifiable routines of use for specific communication purposes within a defined user community" (p. 283).

Table 1. Summary of multiple media use studies

For a specific task, users can either use a single medium at a time or multiple media simultaneously (Massey and Montoya-Weiss, 2006; Bélanger and Watson-Manheim, 2006; Lee et al., 2007), sequentially (Bélanger and Watson-Manheim, 2006; Lee et al., 2007), and repetitively (Bélanger and Watson-Manheim, 2006; Lee et al., 2007). In addition, Bélanger and Watson-Manheim (2006) show

that users can combine different ICTs to send the same message which can be either sequential or concurrent.

Given the overwhelming range of communication media available in the workplace and the possible combinations of media (Lee et al., 2007), one wonders how users manage. Multiple media use enables "message clarity" but also leads to redundancy (Lee et al., 2007). This multiplication of media raises overload issues (Bélanger and Watson-Manheim, 2006), since individuals must cope with the escalation of incoming messages. This processing effort needed to deal with the messages or signals is described as communication load which will lead to information overload (Jones et al., 2004). Information overload occurs when not all communication input can be processed and used (Jones et al., 2004).

Information overload is a managerial issue, as the growing use of ICT tools does not obviate the need for more traditional media. Instead, we observe an accumulation of means of communication that can be likened to the layering typical of a napoleon or *millefeuille* (Kalika et al. 2007; 2008). In other words, as the number of layers increases, the napoleon becomes too much of a mouthful. We thus need to focus not only on multiple media use but also on the coexistence of different media.

1.2 The layering process perspective

The growing use of ICT applications raises the question of whether or not they replace traditional means of communication. Belanger and Watson-Manheim (2006) point out that substitution does not explain the observed media use. Instead, they note innovative media use combinations. Since media coexist, it is necessary to transcend the complementarity and substitution dichotomy. To do so, we propose the layering process perspective as new lenses to examine media use accumulation.

Table 2 compares the layering process perspective to single medium choice theories and multiple media use.

Theories	Single medium choice theories	Multiple media use theories	Layering process perspective
Focus	Choice of a single medium	Management of a set of communication media	Layering process of communication media
Investigation	Why a medium is used?	How and when a set of communication media is managed to complete a specific task?	How and why different available communication media coexist? To put it differently, how different layers of media are superimposed?
References	Daft and Lengel (1986) Trevino et al. (1987, 1990) Carlson and Davis (1999) Fulk (1993) Fulk et al. (1990) Van den Hooff (2005)	Massey and Montoya-Weiss (2006) Bélanger and Watson-Manheim (2006) Watson-Manheim and Bélanger (2007) Lee et al. (2007)	Kalika (2002) Boukef Charki et Kalika (2006) Kalika et al. (2007 ; 2008)

Table 2. Comparison of the layering process perspective to single medium choice theories and multiple media use

We argue that by exploring the layering process we can improve our understanding of how different media coexist and thus address information overload.

We posit that there is a process by which new media are layered over existing media. Layers of media thus overlap. The added media may or may not modify those already present. We can thus expect to identify different forms of layering depending on how the added layer changes patterns in the usage of

extant media. When the added medium is superimposed on existing layers without being mixed in with them, media accumulation is the result. In other words, as the layering process does not reshape the design of previous layers and does not reduce the existing media use, the napoleon effect is more pronounced, and the resulting concoction becomes, so to speak, harder to swallow. By contrast, when the previous layers are redesigned, the napoleon effect is less pronounced. Since the added layer is mixed in, the napoleon is, as it was, easily 'eaten'. The array of available media is better managed.

In addition, as managers use a range of communication means, we need to focus on multiple media usage (Massey and Montoya-Weiss, 2006; Watson-Manheim and Bélanger, 2007). Indeed, managers are not confronted with the exclusive choice of just one medium but rather with managing a set of communication means. To improve our understanding of managers' communication, we focused not only on e-mail use but also on how different media are used.

We demonstrated that the fit between the task and the medium are not the only explanations for the choice of medium. This means that we need to consider situational factors, social influence and the emergent properties of the medium. Moreover, a focus on the use of just one medium is obviously unable to encompass all the complexity of managerial communication. We can improve our understanding by examining how different sets of communication tools are used and we therefore propose the Napoleon effect as a framework for studying media use.

We argue that by exploring the Napoleon effect, we can better understand how managers use different communication media. Their use is explained not only by contingency factors but also by situational factors as well as social influence and the emergent properties of the media. This leads us to expect that the layering process of the new media will vary according to the context, which is characterised by task, organizational environment and the group's internal system (Desanctis and Poole, 1994). We posit that there is not just one Napoleon effect but several, depending on the context.

Our paper aims to study the Napoleon effect in different contexts. We therefore pose the following research question: how does the Napoleon effect differ between managers in relation to their specific contexts?

2 RESEARCH METHOD

To improve our understanding of the layering process that is intrinsic to the adoption of a new medium in different contexts, we conducted a case study in a French car manufacturing company (Eisenhardt, 1989).

2.1 Research sites

Given that multiple cases facilitate comparisons (Eisenhardt and Graebner, 2007), we conducted a multi-site case study that focused on three departments in the company. According to Miles and Huberman (1994), inter-site analyses allow for enhanced comprehension and clearer explanations of the phenomenon under study, while multiple cases provide grounded empirical findings (Eisenhardt and Graebner, 2007). In addition, the more the number of contexts studied, the greater the validity of the research (Lee, 1989). The importance of case selection was highlighted by Eisenhardt (1989) and we therefore selected three departments which differ with respect to the task carried out and the context of ICT use. While promoting the use of ICT tools is a key concern in the company as a whole, we identified certain differences and characteristic features with respect to each of the three departments studied:

Department 1
Department 1 is a strategic department in the company, dealing with car design and engineering. The work is highly interdependent and requires the involvement of numerous collaborators. A great deal of communication is needed to coordinate both inside and between the different units. In this sense, managers work in an open space and units are co-located.

E-mail is the main ICT tool used by the managers. Disparities were noted between the managers, however, depending on their hierarchical level. Senior managers appeared reluctant to use e-mail and needed the assistance of their secretary to process and print their e-mails.

- "... *I followed suit like many of the people here…I was not a pioneer…I had to use it (e-mail) and I used it...*"
- "…*I can't always be sitting in front of my computer to read my e-mails, I need my secretary's help to print them...*"

Department 2

Two main tasks are carried out in this department, namely the design and sale of parts and accessories. The managers work in an open space.
Department 2 is a pilot department in ICT use.

- "... *(name of company) launched a BtoE project and we volunteered to be a pilot department..."* (head of department 2).

The e-management project aims to promote new managerial practices through the use of ICT.

- "... *we were interested in an experiment which allows us go beyond administrative productivity gains to define new ways of working and new practices."*(head of department 2).

The head of the department initiated this project which involves all the local department managers. The e-management project aims to improve coordination mechanisms and define rules to improve e-mail use. Table 1 summarises the characteristics of these objectives.

E-management project objectives	*Details*
Improve coordination mechanisms	The e-management project aims to reduce the number of meetings and encourage informal face-to-face communication.
Define rules to improve use of e-mail	The e-management project aims to improve the use of e-mail. Some rules have been adopted to reduce e-mail overload including reducing the mailing list and avoiding the use of CC.

Table 3: Objectives of the e-management project

While the e-management project is not limited to ICT use, it aims to improve coordination through ICT use.

Department 3

The managers in this department deal with internal and external corporate communication.
E-mail is the main ICT tool used by managers to coordinate the widely dispersed networks so as to manage temporal and geographical constraints.
The characteristics of the three departments studied are summarized at table 4.

Characteristics	Department 1	Department 2	Department 3
Activities	Car design and engineering	Design and sale of parts and accessories	Corporate communication

Context of ICT use	Reluctance of senior managers to use e-mail. E-mail use reinforces the need for a secretary.	Managers use collaborative tools in addition to e-mail. Pilot site in ICT use E-management project aims to promote new working methods Involvement of local department managers in the e-management project	E-mail is the main ICT tool used by managers.

Table 4. Comparison of the three departments studied

2.2 Data collection

Our case study led us to combine several sources of data (Eisenhardt, 1989; Eisenhardt and Graebner, 2007). In addition to interviews, we had access to internal documents and took part in meetings. The meetings were particularly useful in helping us understand the company context as well as that of each department studied. We systematically took notes during the meetings and analysed them later. This mix of methods and sources of data collection enabled us to ensure the internal validity of our research (Miles and Huberman, 1994).

We used diverse data collection methods, but our main sources of analysis were semi-structured interviews (Myers, 1997; Myers and Newman, 2007). We conducted thirty-six in-depth interviews that each lasted one hour on average. Particular emphasis was laid on (1) the work setting, (2) the ICT used to carry out the work, and (3) ICT use vs. traditional media.

2.3 Data analysis

All our interviews, apart from one, were recorded and fully transcribed. We first analysed the media used by each manager, and then in each department. Finally, we compared the differences between the three departments.

Media use analysis

For each manager, we firstly analysed the use of different communication means and then built a media choice matrix.

Intra-case analyses

As recommended by Eisenhardt (1989), we drew up a full description of the characteristics of each department's context. After analysing the different aspects separately (use and choice), we attempted

to establish links between them. We progressively drew up summaries in which we formulated our conclusions in line with our theoretical framework. For each department studied, we built an intra-department matrix to describe the media use. Our familiarisation with the characteristics of each department made the inter-department comparison easier (Eisenhardt, 1989).

Inter-cases analyses

The inter-department matrix compares the differences and similarities between the three departments studied as suggested by Eisenhardt (1989). We also highlighted the specificities of each department.

Our conclusions were formulated through successive iterations between theory and our empirical results. Our interpretations were honed through an analysis of internal documents and the notes taken during the meetings.

Finally, in order to ensure the plausibility of our findings, our results and our own interpretations were presented within the company and communicated to the participants.

3   RESULTS

Meetings remain the company's favourite coordination mechanism, although the number of meetings is a key issue. Managers frequently complain about meeting overload and its impact on their agenda.

- "*... unfortunately, meetings are a disease, a disease of (the name of the company), it's a well-known fact ...*".

E-mail is the main ICT tool used by the managers. It extends communication opportunities as it allows managers to surmount temporal and space constraints.

- "*it allows us to dialogue easily with people all over the world whatever the time or the day, it's no longer an issue… *"

Despite its growing use, e-mail has not replaced the need for other communication means. This means that managers use a set of communication tools in which e-mail is used in addition to meetings and the telephone but does not supplement them. Rather, it leads to the superposition of different communication means whereby different media are layered and thus form the Napoleon effect. Disparities were observed between the three departments in their use of the different communication means, however. A detailed description of media use in each department is presented below.

3.1   Department 1

E-mail use is tracked through an external memory, which enables the history of the exchanges to be traced. This is particularly useful with respect to the number of people involved and the strategic tasks carried out in this department for the company (car design and engineering).

- "*... we need to keep track of the information…to keep tabs on the threads...*".

E-mail use can reduce face-to-face but not the number of meetings. The managers interviewed often complained about meeting overload. This problem is accentuated by the impression that many of the meetings are unjustified.

- "*...We spend a lot of time in meetings…I'm sure that 80% of them are unnecessary...*"

The number of meetings is accounted for by both coordination needs and communication norms.

Indeed, car design and engineering necessitate the involvement of several managers from different units of this department.

- "*...it is a complex product… and it needs the contribution of managers from design, purchasing, manufacturing, logistics units, etc, ... they all have to work together, and this is not simple…*".

Thus, e-mail does not seem to fit the requirements of coordination constraints at this department,

In addition, meetings are privileged coordination means in the department. In this sense, the culture of the company is described as "tribal" encouraging meetings.

- "…*a lot of meetings are useless...nothing really happens... no decisions were made...if meetings are more decision-oriented, we will make fewer...*"

It turns out that even though meetings are required to insure coordination between different units of the department, the higher number of meetings is an issue in this department. Managers suffer from meetings overload.

E-mail overload is also an issue in this department, so managers have taken to using the telephone instead.

- "*to avoid this problem (e-mail overload), we prefer to use the telephone…so that we can have an answer immediately…rather than send an e-mail and increase overload…we place more emphasis on the phone…*"

In short, both e-mail overload and the resistance of senior managers to e-mail use are constraints in the use of this medium. More particularly, problems related to e-mail overload reinforce the need for phone calls. Thus, in this case, we do not only observe an accumulation of different layers of media but also an increase of telephone layer. The outcome of this layering process is constrained by the problems of e-mail use and coordination needs in this department. As e-mail layer fails to reshape the existing ones, the Napoleon effect becomes then more pronounced.

3.2 Department 2

While meetings are considered the main means of coordination in the company, managers in this department say there has been an improvement, with less time spent in meetings and a reduction in their number. Meetings have also become more decision-oriented.

- "... *it was the nature of the meetings that we wanted to change…*"
- "...*we ask for a meeting when there is a complex problem which requires that we meet to discuss about the issues*".

This improvement is in line with the aims of the e-management project. However, contrary to the hoped-for outcomes, e-mail is used with colleagues situated in the same open space at the expense of face-to-face. In fact, e-mail is used to communicate with colleagues who are working close by in order to avoid disturbing them.

- "... *it's something that really amazes me, we're in an open space, and very often you don't hear any voices, just click, click, click... the noise of fingers on the mouse… it's obvious that e-mail has replaced face-to-face...*".
- "… *we use e-mail heavily everywhere in the company and even in meetings. We use it even more than the telephone. As we are overloaded, we cannot see each other very often, we use e-mail instead…it is rather funny as it conveys closeness…*"

Indeed, proximity is perceived as hindering oral communication.

- "*moreover, in open space one hears all… if everyone starts to speaking…it quickly becomes cacophony*"

We also noted a reduction in phone calls eventhough they are still preferred when there is an emergency and there is a need for interactivity.

In this department then, the use of e-mail has led to improvements in meetings but also a reduction in face-to-face contact. E-mail use in this case reshaped the design of previous layers. Unlike the previous department, the layering process of e-mail layer over the existing ones manages to tighten them. The napoleon effect is then less pronounced than it is the case in department 1.

Although the first outcome of this layering process was planned (meetings are reduced and are better managed), the second (face-to-face reduction) is emergent and even goes against the spirit of the e-management project.

3.3 Department 3

While e-mail is the main ICT tool used by all the department's managers, we noted that phone calls and face-to-face communication is preferred.
Phone calls are considered to convey greater proximity. They are also often preferred when managers communicate with their international network.

- "... *the telephone because it confers a certain degree of proximity and is more friendly*..."

This preference for the telephone may be explained by the nature of the tasks carried out, which require greater sensitivity with respect to the relational. In addition, managers prefer face-to-face contact when communicating with co-located workers in the same open space. However, the superposition of the different means of communication has not led to a reduction in the number of meetings, which is considered to be even higher.

- "*(meeting) is an issue in the company, there is a mania of meetings*..."

In conclusion, it appears that in spite of the growing use of e-mail, phone calls and face-to-face are still preferred. E-mail use does not reshape the design of the existing layers.

We summarize the layering process at each department at table 5.

	Department 1	Department 2	Department 3
The layering process of e-mail over the telephone	E-mail overload increases the need for the telephone and thus reinforces its layer.	E-mail layer may tighten telephone layer.	E-mail layer is superimposed over telephone layer without modifying it.
The layering process of e-mail over meetings	E-mail layer does not reshape meeting layer.	E-mail layer may tighten meeting layer.	E-mail layer does not reshape meeting layer.
The outcome of the layering process	The layering process results in an accentuation of some previous layers (telephone layer).	The layering process results in a reduction of previous layers.	The layering process results in an accumulation of different layers without modifying the previous ones.

Table 5. Comparison of the layering process between the studied departments

4 DISCUSSION

Managers use a set of communication tools in which both traditional and new media coexist. Our analysis shows that the use of ICT, in our case e-mail, extends the choices available to managers without completely replacing traditional media. All available media form superposed piles or the so-called Napoleon effect. However, we noted some differences in the layering process between the departments studied. Three forms of the Napoleon effect were identified in this study depending on the context. We first analyse the differences in context and then focus on the characteristics of the different forms of Napoleon effect.

4.1   Differences in the context of each department

The differences between the three departments studied depended on the characteristics of the departments' activities, the communication norms and the context of ICT use (Desanctis and Poole, 1994; Markus and Robey, 1988; Robey and Sahai, 1996).

4.1.1   Characteristics of the departments' activities

The three departments differ mainly with respect to the activities carried out, namely car-design (department 1), sales (department 2) and internal and external communication (department 3). Each department therefore has different coordination needs (Lawrence and Lorsch, 1967) and so differs with respect to its use of communication means. In particular, we noted that the large number of interlocutors and the complexity of the manufactured product led to a high prevalence of meetings in department 1. In parallel, the function of department 3 (communication) leads managers to prefer direct communication and this would explain why e-mail has not replaced the telephone. E-mail use therefore effectively appears to be explained by task-related activities (Yoo and Alavi, 2001). In this sense, Germonprez and Zigurs (2009)   emphasized the need to consider the fit between the technology and the task. Put it differently, the fit between media used and the task that department undertake explains how the layering process takes place.

4.1.2   Communication norms

Along with Hill et al. (2009) we emphasized the importance of communication norms in explaining media use. Moreover, our analysis of e-mail use enabled us to highlight shared practices and communication norms in each of the three contexts studied. We noted, in particular, that meetings remain a privileged means of coordination in department 1, while e-mail is used when communicating with co-located colleagues in department 2, and there is a preference for direct contact in department 3. E-mail use can reinforce or support the emergence of new practices and communication norms that we identified through our analysis of meetings and direct contacts.

The Meeting layer: hard to be removed

Meetings are formal routines (Dosi et al., 2005) through which information is exchanged at different hierarchical levels. In addition to institutional meetings that are planned throughout the year, meetings can either be programmed or not. The number of meetings is a major issue in the company and all the managers interviewed complained about meeting overload. Improvements have been observed in department 2, however. Meetings are better managed and focus more on decision-making. This is largely due to the e-management project, which aims to improve working methods through ICT use. The involvement of local management in the project has helped achieve this objective. The layering process is not spontaneous in this case but has instead resulted from the management's determination to change working methods. Along with Kalika et al. (2008), we emphasized the "involvement of management" effect through the case of the department 2. Local management was in this case successful at influencing the layering process.

E-mail use can either or not reshapes meetings layer depending on the case. Nevertheless, in all the cases, it can not remove the need for meetings and the result is an accumulation of media. Indeed, even if e-mail is used for a broad range of tasks (Van den Hooff, 2005), it can not remove the need for face-to-face communications. It turns out that while the objective features of e-mail explain the layering process, it fails to explain differences the way it happens. We demonstrated that when the e-mail layer is added, the layering process over meeting can have several forms. These differences are explained by the specificity of each context.

The direct contact layer: beyond the apparent contradiction

 An analysis of the use of e-mail in departments 2 and 3 indicates that proximity may be interpreted differently. Indeed, whereas proximity is regarded as a threat to face-to-face communication and

phone calls in department 2, it facilitates face-to-face in department 3. Differences in interpreting proximity are explained by the shared practices and communication norms specific to each context.

- In department 2, managers use e-mail instead of oral communication (face-to-face and phone calls) to avoid disturbing their interlocutors and co-workers.
- In department 3, managers are more sensitive to relational aspects and thus prefer face-to-face communication and phone calls to e-mail use.

The choice of medium depends on the significance users assign to their behaviour, which would either reinforce or support the emergence of new communication norms (Feldman, 1984; Germonprez and Zigurs, 2009). E-mail use does not modify communication norms in department 3 but it does contribute to the emergence of new norms in department 2. Managers prefer to use e-mail even with co-located colleagues. To put it differently, the layering process of e-mail over direct contacts can either or not reshape the design of previous layers.

4.1.3   *Context of ICT use*

While ICT use is a key concern in the company, differences can also be identified between the three departments with respect to the context of ICT use.

- The managers in department 1 need their secretaries to help them process their e-mails, making this form of communication more problematic as a substitution for other forms. In addition, senior managers are reluctant to use e-mail and tend to use the telephone to overcome e-mail overload.
- Department 2 is a pilot site in ICT use. The e-management project aims to improve working methods by promoting ICT tools. Local management is also highly involved in this project.
- E-mail is the main ICT tool used by all the managers in department 3.

In other words, differences in ICT context explain the specificity of e-mail use in each department and thus e-mail layering over the existing layers.

4.2   Different forms of layering process

In our study, we identified different forms of the layering process that depended on the context of each department, analysing the characteristics of task-based contexts, communication norms and the context of ICT use. We concluded that previous media layering can provide insight into the way a new medium will be layered over the existing ones. The use of a new medium can either reinforce or reshape old layers. Users make sense of the added layer taking into account the opportunities and the constraints of their context. The layering process is then far from being a result of an individual rationale choice.

At the same time, we demonstrated that local managers can influence the layering process. They act as sense-givers (Maitlis, 2005) and thus may redesign the layering process. However, this may happen in way that is contrary to the e-management project objectives and may even go against the spirit of the media (Desanctis and Poole, 1994). It turns out that while the layering process can be reshaped by local management, it can also be interpreted and negotiated by managers depending on their particular objectives (Lamb and Kling, 2003). This interpretation may be different from what is initially expected by local managers. Users reshape the layering process through their interaction through the media and with each other. Thus, while the layering process is rooted in the context of media use (the fit between media and tasks, communication norms and the context of ICT use), we demonstrated that the layering process results also from the negotiation of the sense making of users and sense giving of local managers.

To summarise, whereas the layering process is reshaped by previous layering of media, it is also planned and emergent. The layering process is hence socially constructed. We can expect to identify a large number of layering processes in line with the sense local managers attach to the new medium and the sense understood by individual users, taking into account the layering patterns of existing media. We highlighted three forms of layering patterns in this study:

- The meeting is the main coordination mode and it is difficult to substitute this by electronic communication because of the constraints of the departments' activities and traditional communication norms. In addition, both e-mail overload and the reluctance of senior managers to use e-mail can explain its non-substitution for meetings and phone calls. Because of these constraints, the use of e-mail does not appear to change how the previous layers are used, but instead tends to strengthen them. We posit that the layering process of different media is subject to specific constraints, and in this case **the Napoleon effect is seen to be subject to constraints.**
- E-mail use leads to improvements in meetings which are subsequently better managed. In addition, e-mail is preferred to face-to-face communication and phone calls. While it can lead to new communication opportunities, the use of e-mail with co-located colleagues goes against the spirit of the "e-management" project. In this case, e-mail use changes how previous layers were designed. The process of layering is therefore thought through in that it is planned within the frame of the e-management project but is also emergent. **The Napoleon effect thus appears to be both planned and emergent**.
- Despite the growing use of e-mail, phone calls and face-to-face communication are preferred. Both the characteristics of the task carried out and the communication norms encourage direct interaction at the expense of electronic exchanges. In this case, e-mail use does not change how previous layers are designed. **The Napoleon effect may consequently be said to be chosen.**

5   CONCLUSIONS

In spite of the limitations of subjective measurements (managers' perception), which exclude objective factors such as the variation in the number of meetings and phone calls (Limayem *et al.*, 1997), we identified both theoretical and managerial contributions.

The focus on the Napoleon effect enabled us to improve our understanding not only of the choice of medium but also of media use. It provided us with greater insight for understanding how different means of communication are used by studying the layering process that underlies their adoption and use. However, different forms of layering process can be identified, and our study ascertained three forms in particular, i.e. the Napoleon effect may either be **subject to constraints, planned and emergent** or **chosen**, depending on the context. We demonstrated that the Napoleon effect depends on both the sense-making of users and the sense-giving of local managers. The layering process is thus interpreted and negotiated by users (Lamb and Kling, 2003), which can either be in line with or go against the spirit of the media (Desanctis and Poole, 1994). The Napoleon effect is the result of a negotiated use of the media, depending on the design of previous layers. This negotiation can either modify or reinforce the existing media layering. Far from being the result of rational use at individual-level, the Napoleon effect is in fact socially constructed by the different users depending on their context. This can explain the disparities between organisations when they adopt a new medium. As we pointed out earlier, the use of a new medium can have different and even contradictory effects depending on the context.

We also demonstrated that the layering process can improve working methods. In this case, it necessitates the involvement of management and a rethinking of the coordination mechanisms. This may provide solutions to companies aiming to improve their use of communication means.

Our study was conducted on a set of communication means that included e-mail, meetings or face-to-face and phone calls. Future studies could examine a more diversified set of communication means. In addition, our focus on the Napoleon effect is static. Further research could examine the Napoleon effect at different points in time. A future line of research could be to analyse how the Napoleon effect would evolve with the introduction of new ICT tools such as mobile technology.

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