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The Constraints That Digital Technologies Can Exert On Organizational Practices: Findings from the Study Of A Sales System

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ABSTRACT: *In a fast-changing environment, the democratization of the use of digital technologies and the digital transformation have more and more notable impacts on the organization, its processes and practices, generating not only new possibilities for the use of information systems but also constraints. In our case study of a large external advertising company, the role of the Information System in managing the media offer is crucial. The aim of this paper is to analyze and to understand the negative impact of changes in the material properties of a digital solution on the users' practices as part of the sales process through the application of the perspective of weak sociomateriality. For this research exercise we used a qualitative approach based on 42 semi-structured interviews conducted as part of a longitudinal study from 2011 to 2018, complemented by observation and documentary analysis. Our case study shows that as multiple ways of imbrication between material and human occur in organization, users' practices change and can be hindered by the components of the technology. It also demonstrates the permanent and sometimes temporary changes in the material properties of an information system, thus affecting – positively or negatively - the practices in the organization.*

Keywords: *Sociomateriality, Practices, digital technology, Imbrication, constraints, Case study.*
Research field: *Business Management*

I.   INTRODUCTION

In a fast-changing environment, the democratization of the use of digital technologies and the digital transformation are having more and more significant impacts on the organization, structure, management, relationship to work, processes, practices, exchanges between people, and skills of all the actors in the company, as well as those of its stakeholders and customers.

By offering employees more autonomy, flexibility and participation in an open and globalized ecosystem, digital transformation can also generate information overload, intensification and individualization of work, increased control of activity, changes in work processes and practices, and excessive constraints on reactivity to the information systems (IS) that are not always keeping up with the new organizational requirements.

Digital transformation refers to the process that consists, for an organization, of integrating one or more digital technologies into all of its processes. There is growing scholar and managerial interest in the notion of management innovation, that is, the conception and implementation of novel management ideas which could potentially contribute to the strengthening of a firm's competitive position (Birkinshaw et al., 2008; Vaccaro et al., 2012). Birkinshaw et al. (2008) define management innovation in their seminal paper as a concept that relates to the introduction of new management practices, processes, or structures intended to further organizational goals.

In our article, we have chosen to highlight the evolution of the material properties of the digital solution to complete the scientific debate of the impact of digital solutions on practices, rather from the point of view of

the constraints encountered by users following the introduction of a new technology in their processes and practices.

The empirical study is conducted within the JCDecaux Middle East organization through the implementation of its sales system Odex and aims to explain and analyze the negative impact of the material properties of a sales system called Odex on the practices of its users over time, based on a longitudinal study.

The paper is structured as follows. In the next section we present a review of the literature to which the existing study relates. After discussions on the research context and methodology, we present the findings obtained from the empirical analysis of Odex's material properties and practices during the period of 2011–2019. We conclude the paper by presenting discussion, conclusion with the practical and theorical contributions, and possibilities for further research.

II.   LITERATURE REVIEW

The materiality of an Information System (IS) essentially refers to its properties: what it is made of, how it works and what its characteristics and functionalities are. We have chosen to use the perspective of weak sociomateriality to investigate the materiality and the social aspects related to the practices of the actors in the JCDecaux Middle East Organization.

1.1 Study of materiality and practices through the Weak Sociomateriality perspective

Against the strong sociomateriality (Orlikowski, 2007, 2010; Jones, 2014) that considers that social and material exist only in their "intra-action" (Jones, 2014; Barad, 2003), weak sociomateriality (Leonardi, 2010, 2012, 2013) considers that the properties of material and social agencies can be identified and studied separately. The interaction between the two agencies is identified under the concept of imbrication (Leonardi and Barley, 2008). Given that we decided to approach our field according to 2 separate axes: practices and materiality of the IS. We decided to mobilize the weak sociomateriality in our case study. The Table 1 below is a detailed comparison between the Weak Sociomateriality and the Strong Sociomateriality.

	Strong Sociomateriality Orlikowski perspective	**Weak Sociomateriality Leonardi perspective**
General Ontology	There is no social interaction that we can separate from materiality. There is only a merged "sociomateriality".	The social context and materiality are separated. Social and material become "sociomaterial" when humans interweave social and material agencies.
General epistemology	Analysts make arbitrary distinctions between what is "social" and what is "material" ("agential cuts") when they look at a unified whole ("sociomaterial")	Analysts determine how and why social and material interweave to become the "sociomaterial' and persist over time.
What is ''Materiality'' ?	There is no materiality. There is only sociomateriality.	The arrangement of the physical and/or digital materials of an artifact in particular forms, that persists through time and space
What is ''Social'' ?	There is no social. There is only sociomateriality.	Abstract concepts such as norms, rules, communication patterns, etc.
What is ''Sociomateriality'' ?	The inherent inseparability between the material and the social.	The constitution of particular sets of activities that combine materiality with institutions, norms, speeches, and all other phenomena defined as "social".
What is ''Practice''	A sociomaterial achievement.	The space in which social and material agencies become constitutively indissociable through the process of imbrication.
Methodological analysis units	The Sociomaterial practice.	Social and material agencies.

Important ideas for Methodology	Identify the implications of sociomaterial practices for organizational processes (e.g., identification, negotiation, etc.)	Identify how social and material become sociomaterial and what implications this has for the organization (e. g. communication networks, centralization, etc.)
Potential conceptual contributions	Demonstrate how all organizational processes are sociomaterial and how recognizing this fact can improve their theorization. Demonstrate that the organization appears in practice and that this practice is neither social nor material but both.	To show how organizations and technologies have become what they are and why we think they should be like that. Move technology to a constituent role in the organization and organizational processes while showing how the organization adjusts technology.

Table 1: Comparison of Weak Sociomateriality and Strong Sociomateriality for the study of Sociomateriality - (Leonardi, 2013, Table 2)

Leonardi (2012, 2013) considers that the term "sociomateriality" is used to highlights the role of the material in all situations considered as social and to focus on the consequences of the interactions between the human agency and the material agency. It is through that perspective that materiality is defined as the arrangement of the physical and/or digital materials of an artifact in particular forms, that persists through time and space, while practice is the space in which social and material agencies become constitutively indivisible through the imbrication process (Leonardi, 2013).

While any object is the result of a process of social elaboration before being interpreted and used in social contexts (Latour, 1994; Pinch et al., 1989), any social action is only possible through the use of multiple forms of materiality. From this perspective, it is not the objects that are sociomaterial, but the practices. Leonardi considers the materiality of technologies as independent of humans and persistent across time and space. Such perspective is particularly necessary given the dynamic, distributed and interdependent nature of the technologies in use today and the multiple and unusual ways in which they guide and will continue to guide organizational realities and practices.

1.2 Imbrication of Social and Material

In their studies, Leonardi and Barley (2008) suggest the notion of imbrication; by focusing on "the interweaving of material and social". In his 2011 article, Leonardi points out that routines and technologies are the infrastructure that imbrication of human and material agencies produce. In other words, he considers that " if we were to examine routines and technologies under a microscope, we would find that each one is made up of the same basic building blocks: human and material agencies" (Leonardi, 2011, p. 151).

The metaphor of imbrication is in several ways useful for explaining the interweaving of human and material agencies for the study of practices in the organization. First, imbrication suggests that human and material agencies are efficient in producing results (e.g., practices or technologies) only when they are joined together, but that their interdependence does not belie their distinct characters (Leonardi, 2011).
Secondly, because the metaphor of imbrication sensitizes us to the production of durable patterns, it reminds us that all interactions between human and material agencies produce an organizational residue (Leonardi, 2011), it's the case of routines or technologies, which representations persist in the organization in the absence of their creators. In fact, when human and material agencies intertwine to produce routines or technologies, these models are characterized by their durability.
Accordingly, the research question to be addressed in the study is:
How do the material properties of a digital solution constrain the practices of its users in the context of an outdoor advertising company?

III. RESEARCH METHOD AND EMPIRICAL SETTING
### 3.1 Methodological position and design

This case study is based on a PhD thesis that has been defended in June 2019 and one of the authors of this article is an employee since 2015 of the organization being studied. The choice of this organization as a case study is justified partly theoretically, and partly by methodical opportunism as described by Gerin (1989, 2004). This organization is responsible of one of the regions of a French international company operating in the outdoor advertising. Created in 2008 in the Middle East, this region now consists of 6 subsidiaries and is positioned in a highly competitive market where the efficiency of the sales teams determines the achievement of revenues. The managing directors of the subsidiaries as well as the sales managers expressed the need to equip their department with a digital solution to optimize sales and better monitor the implementation of the

department's activities. Our study focuses on the constraints that a sales system (Odex) can exert when it is integrated into an organizational practice (selling advertising products).

The integration of a sales management technology into an international company is characterized by the emergence of interactions between different actors of the organization and the system in place, which inevitably reshape the organizational practices and processes, not only in a positive way. It is therefore interesting to examine and understand how the material properties of this digital solution constrain the practices (social and material) of the users. Given the exploratory nature of our research subject, we performed a single in-depth qualitative (Dumez, 2016 ; Yin, 2013) case study conducted within JCDecaux Middle East. We mobilized a research protocol based on participant observation, documentary analysis and forty-two semistructured interviews with users in the sales department.

3.2 Data analysis method

A cross-tabulated data collection techniques have been used during our research. Triangulation of data and sources allows information to be compared and aggregated, increasing the internal validity of this research. The empirical research is based on forty-two semistructured interviews conducted as part of an in-depth longitudinal study that took place between April 2011 and March 2019 and was based on a process-based analysis of the sales Information System (IS) named Odex. We stopped adding new interviews once we reached saturation on the categories of our thematic analysis (refer to Table 2 in the Appendix for the interview guide). The interviews' data was subsequently coded and analyzed using Nvivo 12 (refer to Figure 2 in the Appendix, which represents three examples of analyses carried out in Nvivo 12). The figure below is an illustration of the materials used in our qualitative study.
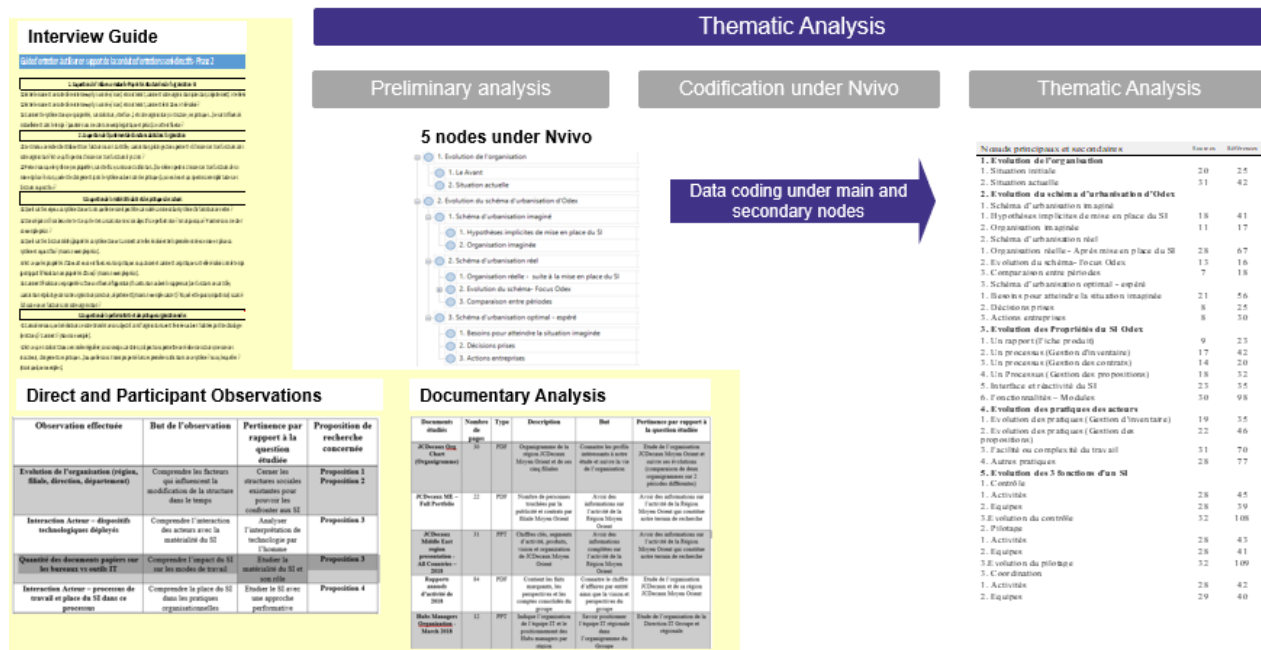
Figure 1: A combination of different materials in the qualitative study to insure the empirical validation - Case study: JCDecaux Middle East (ME) and Its Sales Information System (Odex)

The case study has been performed in a French international company operating in the outdoor advertising. The company's name is JCDecaux and comprises three segments: Street Furniture, Transport Advertising and Billboards. The company is the world leader in the first two segments and number 1 in Europe in the Billboards segment. JCDecaux's business model can be summarized as the installation of furniture/assets in cities (airports, shopping centers, streets, metros, etc.) enabling them to take advantage of many services (bus shelters, self-service bicycles, mobile device charging stations, etc.), in return, these services are financed by advertising spaces that will be sold to brands (advertisers, clients) for a fixed duration.

Since its creation in 1964, the organization's strategy has been aiming to strengthen its worldwide presence and is now present in 75 countries and employs more than 13,000 people. In 2008, the company created its first subsidiary in the Middle East region and more specifically in the United Arab Emirates. The Middle East Region has 298 employees, 98 are salespeople (33% of the staff) and 6 subsidiaries supervised by a Middle East regional structure created in 2011: Dubai and Northern Emirates (created in 2008), Qatar (created in 2008), Saudi

Arabia (created in 2010), Oman (created in 2012), Abu Dhabi (created in 2013) and finally Bahrein (created in 2020). Our study will focus on this region and more specifically on the Dubai subsidary, the first entity in terms of revenues and to implement the Odex sales system in 2012.This subsidiary is also chosen because of its geographical proximity to JCDecaux Middle East's Regional Division.

In 2012, without much experience in choosing an IS as it was previously imposed by the corporate entity in France (SAP and Saphir (Business Object) for financial management, Bee for the Intranet), JCDecaux Middle East began the selection then the implementation of a sales management technology, which was highly requested by the Dubai subsidiary, which was no longer able to absorb the workload generated by the large quantity of information related to its clients portfolio. The choice and deployment of the "Odex" sales system was carried out by the Regional entity.

Eight years later, this system is now being deployed in all the region's subsidiaries. Odex is considered the main IS of the region and groups 3 areas of the organization: Sales including Marketing, Operations and Finance. The purpose of this system is to integrate all the sales, financial and technical information from these three departments to make it available to decision-makers. It is an Information Technology (IT) solution developed by a South African supplier and that should ensure the achievement of the main milestones of a sales process, i.e. monitoring the availability of advertising assets for future advertising campaigns, making bookings and establishing media offers for existing clients or future clients (prospects).
Starting 2018 and till today, many discussions between the IT Department of the region and the sales departments of the subsidiaries took place to think about ways to integrate this system into users' practices to better optimize the sales process.

The study of the evolution over time of sales practices and the material properties of the Odex system was essential in our study to understand the interaction between these two components of the sales process and more specifically to study the constraints linked to this interaction "digital solution - user practices". Our empirical research was carried out through a sociomaterial reading.

IV.   Findings

How do the material properties of a digital solution constrain the practices of its users in the context of an outdoor advertising company? To investigate this question at an empirical level, we chose an in-depth study of the JCDecaux Middle East organization's sales information system "Odex" as our research strategy, and we drew on the conceptual framework of sociomateriality and the lessons learned from the longitudinal analysis approach.
More specifically, we focused on :
(1) The study of the evolution of JCDecaux Middle East as an organization and of Odex as a digital solution in three steps:
-        2008 to 2011: start of activities in the Middle East region (creation of three subsidiaries) with Corporate information systems.
-        2012 to 2014: creation of two additional subsidiaries and implementation of Odex in the Dubai subsidiary.
-        2015 to today: maturity level of all organizations and deployment of Odex inside all the subsidiaries.
To achieve this, the urbanization plan for each of these three periods was reconstructed and analyzed.
(2) Study of Odex materiality through its properties and their evolution.
(3) The study and analysis of the evolution of the practices following the use of the Odex system.
The results of this empirical study highlight that Odex fundamentally possesses stable or evolutionary properties, defined as its materiality. Like any other information system, Odex produces effects only when used in the framework of sociomaterial practices. If there is interpretative flexibility on the part of social actors in their IS practices, the properties of this IS can constrain these practices: some actions are possible, others are not.

In our study, we have chosen to analyze cases where Odex has constrained the practices of actors and has negatively influenced teamwork.

During our empirical study, several interviewees insisted on the fact that theoretically a system must be flexible in order to match the practices and needs of the users and the activity of the organization. The reality is that users are obliged to change their practices to adapt to the constraints imposed by Odex. The required developments and the addition of new properties are not always in line with the needs expressed by the various departments.

On the one hand, Odex has added a layer of difficulty to the workflow because of bugs, system slowness and missing properties that push each user to work on other external systems and double-check each piece of information before drawing a conclusion.

As part of the daily use of this technology, adding new functionalities/properties continuously slows down the system or even shuts it down for hours, forcing users to manage two separate systems in parallel

(Excel and Odex) to ensure that information is consistent and will not be lost in the future. At the end of the process of integrating a new property, bugs are systematically caused in several modules in the system and sometimes the Information Technologies (IT) team asks users to re-enter information that has been lost during the process.

On the other hand, the system does not allow reports and analyses to be generated automatically, which consumes days of work for each team with inconsistencies between reports generated by different people (styles and contents). Once the report is generated manually, often in Excel, it must be compared to the data displayed in Odex.

There are very few ways to control the information in Odex. Each subsidiary and department have their own working method and practices for cross-checking information. For example, in Oman, in parallel with Odex, the subsidiary saves several Excel and PowerPoint files containing the same information as Odex. The members of the subsidiary use these files as a proof of controlling the output generated by Odex.

At the same time, the system often omits some contracts or overlaps contracts signed with agencies. Moreover, even this inaccurate extract of contracts is only possible through and with the support of the regional IT team and normally takes 30 minutes to an hour to be generated.

The process of validating discounts and contracts can hinder user practices since it depends on the availability of managers who must perform validations in the system and sign contracts in paper format. Since they are not always available and the system is not accessible via mobile and/or remote access, managers are often late in approving contracts. This has an impact on the day-to-day practices of managers and salespeople because these validations did not exist in the past. This has a negative impact on the billing and cash collection process since invoices are also sent late.

Odex as a digital solution for sales has led to a great deal of initiative from users but at the same time it has constrained their working methods which has forced the organization's actors to look for alternative solutions (Excel, emailing, Powerpoint, phone calls etc.).

V. DISCUSSIONS AND IMPLICATIONS

5.1 Discussions

When studying the constraints related to the use of the Odex system by the departments of the JCDecaux Middle East organization, we find that the evolution of practices (and the impact of practices on the system) of the system changes over time and according to the user profile, as different properties are added to the system. If the system was endowed from the start with these potentialities of options (generation of reports, qualification of proposals, realization of predictions...), it is impacting the organization only as they are discovered and practiced by human actors.

This approach by the constraints of the system shows with great precision a process of adding properties to an existing technology. Each addition is motivated by a goal and impacts (often unexpected impacts) the organization. Leonardi (2011) talks about the ambivalence of technological artifacts, insofar as all the functionalities are present in the system from the start. However, it is their detection or their appropriation for a given purpose that makes them produce effects on organizational structure and practices.

The practice of a technology depends on the human agent taking into account the properties of the IS, understood as its materiality, but also the properties entered by the IT team (IS supplier/designer + internal team), and those added by the user during prior practices (data entry, configuration, customization...). It also depends on users' knowledge, skills and expectations about the system; which depends on the attachment and meaning that past practice experience has generated in the user.

As multiple ways of imbrication between material and human occur in organizations, practices will change and may become visible and analyzable. In this way, these practices can be considered as flexible structures that develop and change to generate constraints in the use of technology. These practices evolve over time to reflect the variability of the material elements that make up the system.

In addition to these results, our study in terms of practices shows that there have been different types of changes in the properties of the IS in relation to new practices. At least two types of changes can be identified: one is a temporary change in the properties of the IS for experimental purposes, the other is a more permanent change. A temporary change in the properties of the IS reflects the situation when new practices emerge to address an immediate problem. For example, the practice of viewing all contracts on the Odex interface to serve the immediate purpose of "checking that all sales are properly reported in the system". The other change comes at a time when practices have emerged to serve a long-term goal. For example, responding to the sales process, from typing the proposal to generating the contract. Therefore, we could argue that the change of the properties of an IS can be temporary if it has a single purpose and can be sustainable if it becomes a common practice.

In terms of change that can provide a long-term impact, the study by Bjørkeng, Clegg and Pitsis (2009) may have an interesting involvement. By conducting longitudinal ethnographic research on large project alliances, they studied the process of "becoming" a practice. They argued that "practice", as a new model of interaction,

became a series of predictable activities. These activities included (1) limits of creation, which define the processes of legitimacy of a new practice, (2) negotiation of competencies, which defines how practitioners establish them, and (3) adaptation of materiality, which defines the concretization of the practice of items.

5.2 Practical contributions

Our positioning within JCDecaux Middle East as well as our study of the constraints relating to the implementation of the technology led us to investigate the determining factors for the integration of the Odex sales system into user practices and the management of this project.

Our process analysis based on a longitudinal study of Odex allowed us to understand the evolution of this system since its first year of implementation.

Practice-based research considers the implementation of a technology as a continuous emerging effort of a series of imbrications between actors, practices and technologies. Based on this viewpoint, several conclusions were drawn from the study.

- Having a "Project Leader" capable of leading and supporting the technology project is considered an important factor impacting the success of system implementation (Umble, Haft, &Umble, 2003). This study suggests that we may also want to examine the role that a project leader plays and how the position (or status) can be constructed in an emergent way and in response to a given situation.

Odex implementation project initially did not have a project leader, but the arrival of a new Managing Director for the Middle East region served this function: he also knew how to initiate this large-scale technology implementation project by convincing the directors of the region's subsidiaries to commit and by setting up a steering committee made up of the IT Manager and key actors including all the departments. However, as the study reveals, he had to overcome several challenges to position himself as the project leader. Hiring the right IT Manager was one of those challenges. Although the IT department assigned a "project manager", this was not enough to manage the entire project. His role was limited to planning updates, taking the IT side of the project into account, and transmitting and coordinating requests to the Odex system provider for any development.

In addition, this project leader also had to play a driving role in the implementation of the IS by strategically networking various meetings and actors to enable exchanges between the system's stakeholders, a smooth decision-making process and concrete actions in line with the organization's objectives.

- It is important that the actors involved in this type of project have the necessary skills to draw on the pool of resources and react to situations and difficulties encountered (Baker and Nelson, 2005). Bechky and Okhuysen (2011) conducted an ethnographic study of organizations that regularly deal with surprises, such as SWAT[1] police teams and film production teams, and found that these individuals engaged in organizational tinkering, restructuring their activities by changing their roles, reorganizing their routines and gathering their strengths. In the case of the Odex system, it would have been important to integrate people with both technical and business skills into the project. Separating these two areas led to discrepancies between the three visions of management, use and development, and caused delays in the integration of new functionalities, notably due to a lack of understanding of some needs and gaps in terms of priority management.

5.3 Theoretical contributions

The theoretical framework of this article is based on a sociomaterial perspective that reflects a relational ontology of human and material agency. It supports the ontology of separation between the two agencies to explain social phenomena within organizations (Kallinikos et al., 2012; Leonardi, 2012a, 2012b; Orlikowski and Scott, 2008; Orlikowski, 2010). To reflect this ontological perspective, this research operationalizes work practices within the organization, in particular sales practices across an IS, using the concept of imbrication defended by Leonardi (2011, 2012a, 2012b). This perspective provides an interesting alternative approach for understanding practices when carrying out one or more activities in an organization.

Instead of trying to understand the sales process from a purely social or largely social perspective, or interpreting it from a deterministic framework of material/technology, the sociomaterial practice approach is able to reveal the meanings of imbrication and materiality that influence the way sales systems emerge to meet an organizational objective.

The imbrication process that has been employed to analyze the empirical data has contributed to our understanding of several aspects of the sales process and interdepartmental relationships. It helps to analyze the complexity and constant interrelationship and changes that occur in the organization's activities and practices at the micro level. It also allows us to break down and unravel the complex interrelationships within the empirical data collected so that they can be explained and presented in an understandable way. This framework provides the researcher with a guide through which to structure the writing of empirical data in a simplified way. This simplification allows authors to produce a readable report of the case study.

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[1]Special weapons and tactics in the United States

Indeed, the imbrication process provides a tool for understanding sales practices in order to see how social and material, which are the two constituent elements of organizational practice, influence each other and can hinder the dynamic development of organizational practices. In general, the sociomateriality perspective claims that, fundamentally, sales practices are constitutively made by successive interactions between people and material. The omission of any of these elements in the explanation of organizational practices will accentuate gaps in our understanding of organizational realities (Leonardi, 2012a, 2012b; Orlikowski, 2007).

VI. CONCLUSION AND DIRECTIONS FOR THE FUTURE

Mobilizing the concept of imbrication to analyze and make sense of the empirical data presented several difficulties. One of them is the concept of materiality (and associated concepts such as performativity) which is defined as the part / function of material and / or technology that is not controlled or only partially controlled by humans. Another recurring confusion that has arisen in the analysis of the empirical data concerns the categorization of technology. In our analysis, several materials are cumulatively involved in explaining some socio-material practices. However, the imbrication process shows the material as "one material".

This study suggests that bridging the gap between users' expectations, the implementation of a system and the use of technology is a way to explore how sociomaterial imbrications involving the large-scale deployment of a system appear, persist and evolve over time in an environment of selling advertising space. While this strategy has proven to be very useful in clarifying the influence of digital solutions designers on client organizations, it is recognized that it is difficult to complete the development cycle in an acceptable timeframe. This work could then have benefited from an extension of the deadline to adequately inform the main Odex supplier of the gaps and bugs perceived by the actors questioning the system and its use during this research and thus be able to carry out an evaluation of all the missing properties of the system that were brought to light during our investigation.

During this study, it was recognized that our role as researcher/employee at JCDecaux Middle East offered considerable advantages in terms of both access to information and the ability to observe sociomaterial interactions "in practice" over a long period of time. The theoretical model of sociomateriality that was tested in this research would benefit from being retested and refined. Research undertaken by groups or individuals with different perspectives and ideally not involved in the management of the organizations being studied would eliminate any question of methodological bias and would provide additional empirical support for the robustness of this work.

A fundamental limitation of this research that can be the subject of future investigation is the type of technology being studied. Many studies highlight that investigations of technologies that are less fixed in terms of technical structure and are easily modified by the user, or investigations in technologies designed and used within the same organization (in-house technology development) may offer a significant advantage to organizations and end users.

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APPENDIX

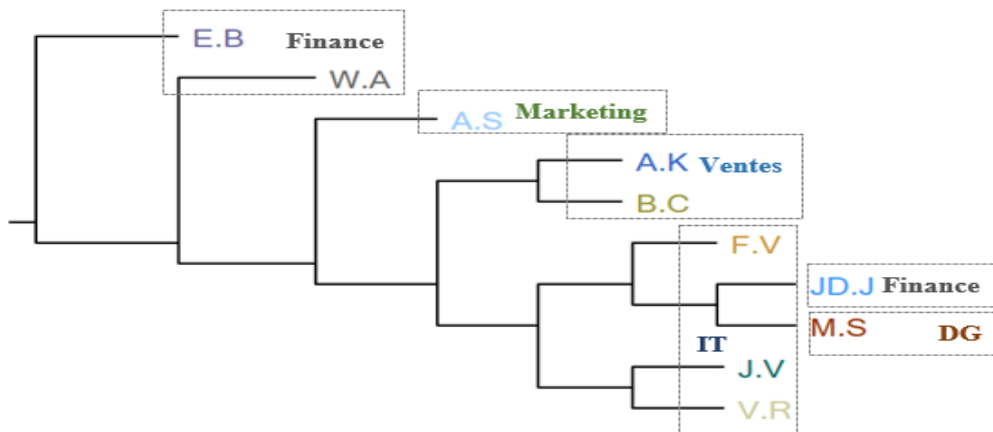**Table 2:** Semi-structured Interview Guide

1.   Theme 1 - The question of the mutual influence between the structural properties of the organization and the IS 1.1   Between our initial interview (x year / month ago) and now, how did your organization (management, department) evolved? 1.2   Between our initial interview (x year / month ago) and now, how did the Odex IS evolved? 1.3   How the Odex system (its properties, use, interface...) and your organization (its structure, its practices...) have influenced each other over time? Could you give me an example (practical and relevant) of this influence?
2.   Theme 2 - The question of human interpretation of technology 2.1   What are the challenges of the Odex system and to what extent, it can be considered a good sales information system? 2.2   Does Odex meet your needs and is it in line with your performance objectives? If not, why? Could you give me a specific example?
3.   Theme 3 - The question of the materiality of the IS and the practices of the actors 3.1   What are the features/properties of the Odex system and how have they evolved between the first year of implementation and today? (Have a specificexample). 3.2   Did Odex's properties had an influence on your daily practices and how did these practices evolve over time (in relation to the evolution of Odex's properties)? (Have a specificexample). 3.3   How did the evolution of Odex's properties influenced the appearance (accentuation or deletion) of control, coordination and steering functions in your organization (management, department) (Have a concrete example)?
4.   Theme 4 - The issue of organizational practices 4.1   Do you consider that the achievement of your work and objectives in the organization are slowed or facilitated by technology (the Odex IS) How? (Have an exemple). 4.2   By using Odex on a regular basis, have you been able to see that it can enable you to carry out practices (measuring indicators, changing practices...) that you didn't thought of when you first used this system? If so, whichones? (Have some exemples).

Figure 2: Processing of qualitative data under Nvivo 12– Some examples

a.   Nodes created under Nvivo to handle the verbatims of the 42 semi-structured interviews

b.   Data Sources grouped by word similarity and department under Nvivo

c.   Frequency of words in interviews by department under Nvivo 12

Fréquence du mot « Flexibilité » par Département

Direction Générale	13
Marketing	10
IT	10
Ventes	3
Finance	2
Client Servicing	
Opérations	

Nombre de références d'encodage

Fréquence du mot "Lent" par département

Ventes	9
Direction Générale	6
Marketing	5
Opérations	2
Client Servicing	
Finance	
IT	