

Analyzing the path of dashboard appropriation: A three-dimensional examination from rational, psycho-cognitive and socio-political perspectives.

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Abstract

Initially, the dashboard was regarded as a purely rational and objective tool, designed to assist decision-makers in managing their organization by providing a clear and precise view of performance. Failures in dashboard adoption were often attributed to inherent flaws in the tool itself, without considering the interactions between the user and the artifact. However, in recent years, a new approach to appropriating management tools, including the dashboard, has emerged, placing the user at the heart of the reflection and integrating psycho-cognitive and socio-political perspectives alongside the rational perspective.

In this article, we seek to understand how actors perceive the process of appropriating the dashboard. We conducted a case study on three Moroccan SMEs to identify the different perspectives—rational, psycho-cognitive, and socio-political—that influence the dashboard appropriation process.

Keywords: adoption ; appropriating ;dashboard ; prospects; the psycho-cognitive, the socio-political.

1 Introduction

Management tools are "at the crossroads of theories produced by management sciences and managerial practices" (Martineau, 2008). Terms such as management tools, managerial techniques (Moisdon, 1997), management instruments or management devices (Foucault, 1980) are frequently mentioned in research on management practices. These tools are designed to aid in the management of organizations, advocating for a rational approach that emphasizes the intrinsic qualities of management tools concrete elements enabling the tool to function. This perspective reduces these tools to neutral instruments with only a capacity to act (Moisdon, 1997). This reasoning aligns with the positivist view of organizational situations found in economic literature and the rational actor model. According to this approach, the management tool is separable from the actors who create and implement it, serving to objectify subjective actions (Lorino, 2002) by framing behaviors and activities to make them predictable and deterministic. Consequently, the management tool is an artifact that formalizes collective action, addressing the complexity of management situations by explaining managerial activity and facilitating intellectual work.

Introducing a management tool within a social context leads to significant upheavals that impact the stability of organizational routines, often causing unpredictable and unexpected changes in organizational dynamics. In practice, each actor interacts with the tool uniquely based on their perceptions, making the tool malleable and sometimes leading to unintended uses, misuse, rejection, non-use, and the emergence of unwanted behaviors such as resistance.

The emergence of alternative, socially-oriented approaches is a response to recurring observations that the uses of management tools cannot be predetermined. These approaches emphasize the organizational actor as the primary subject of concern, creating new research perspectives through a more constructivist lens, particularly the socio-material approach (Orlikowski, 2007) and the appropriation approach (Vaujany and Grimand, 2005; Vaujany, 2005). Since the works of Certeau (1980), Schön (1983), and Alvesson and Willmott (1996), which highlight the study of the appropriation of management tools by actors, the management tool is no longer seen merely as a representation of reality or a lever for organizational rationality. Instead, it is reconceptualized around more semiotic notions (Guilmot et Vas, 2012) such as rhetoric, power, learning, and organizational change. Management tools are considered agents of organizational change, supporting the structuring of relationships between actors and promoting reflexivity and learning (Lorino, 2002; Lorino and Teulier, 2005; Vaujany and Grimand, 2005).

The dashboard, as a management tool, (Bouquin, 2001) has followed the same trend as other practice and research tools. Although it has often been considered a "rational" tool, the dashboard is increasingly viewed through an appropriative lens that emphasizes interactions between the tool and the user, highlighting emerging issues that may disrupt the process. Indeed, a dashboard is never used in a neutral environment but must navigate existing logics and rules within the organization.

This research thus explores the implicit dimensions related to the dashboard appropriation process, particularly the changes in relationships between actors, legitimacy and power systems, social representations, and actors' perceptions of actual tool usage. The central question of this research is: **How do actors apprehend the use of the dashboard?** This involves studying the dashboard as presented to organizational actors, precisely describing their perceptions of its use to deepen our understanding of the elements characterizing the dashboard appropriation process. To address this issue, we examine the appropriation process of the dashboard by considering rational, psycho-cognitive, and socio-political perspectives.

The empirical methodology of our research consists mainly of a qualitative approach to interpreting our research proposals. Our research problem will be explored through the case study method. We examine three cases of Moroccan Small and Medium-Sized Enterprises (SMEs), following an abductive approach to explore these perspectives.

In this study, we will begin by presenting the theoretical framework of the aforementioned perspectives, and the dashboard in particular. We will then present our conceptual model and research propositions. Following that, we will address the research methodology and the results of our study, then discuss our findings, concluding with a final summary.

2 From the rational perspective to the appropriative approach of management tools

Modern organizations are characterized by an abundance of instrumental devices that facilitate the management of collective action. Contemporary research places significant emphasis on the implementation of these tools and the dynamics of change that they entail (Hatchuel and Weil, 1992; Lozeau et al., 2002; Vaujany, 2005; Grimand, 2006; Aggeri and Labatut, 2010). In this context, the focus often lies on the proper appropriation of these tools by company actors and their ability to support organizational strategy.

According to positivist theory, the management tool is a "representationist" instrument, characterized by its ability to replicate and simulate reality. It aims to objectify the economic

nature of activity, free from the subjectivity of human judgment (Lorino, 2002). Agamben (2006) describes the management tool as "everything that has the capacity to capture, orient, determine, interpret, model, control, and ensure gestures, conduct, opinions, and speeches."

Hatchuel (2000) emphasizes the link between management tools as techniques and the rationalization of collective action. He addresses the rationality of decision management and defines the management tool as a mediating element that prescribes the most rational and logical method for organizing work and achieving managerial objectives. The actor, being disembodied, follows an instinctive succession of three cycles: the "design" cycle, the "adoption" cycle, and the "use" cycle (Rogers, 1995).

The "rational" approach is evident, given its importance in the functioning of organizations and the economy. However, it treats the actor-users of management tools as inanimate, neglecting the social dimension, also described as contextual (Hatchuel and Weil, 1992). This perspective repositions the actor in relation to the management tool, making them inseparable since the tool encompasses not only a technical function but also a managerial philosophy (Hatchuel and Weil, 1992). The rational status granted to management tools is not a certainty, as they are constructed, fed, and used by actors whose behavior and judgment are marked by subjectivity.

Research from the "French school on management tools," particularly from the Scientific Management Center of the Ecole des Mines and the Management Research Center of the Ecole Polytechnique (Berry, 1983), has repeatedly observed that management tools do not produce the expected behavior or results once implemented in organizations. Actors produce meaning and language around management tools, sometimes derailing their intended purpose to better serve their own interests. These researchers do not focus on intrinsic flaws of the tool or inappropriate organizational conditions. Instead, they reconsider the nature of the management tool. The deviations from prescribed use, observed throughout the organizational use phase, are explained by the tool's reliance on representation conventions. This representation is the result of subjective behaviors, which can prove problematic during the tool's operation within the organization. Therefore, management instruments carry a representation of the organization and its functioning.

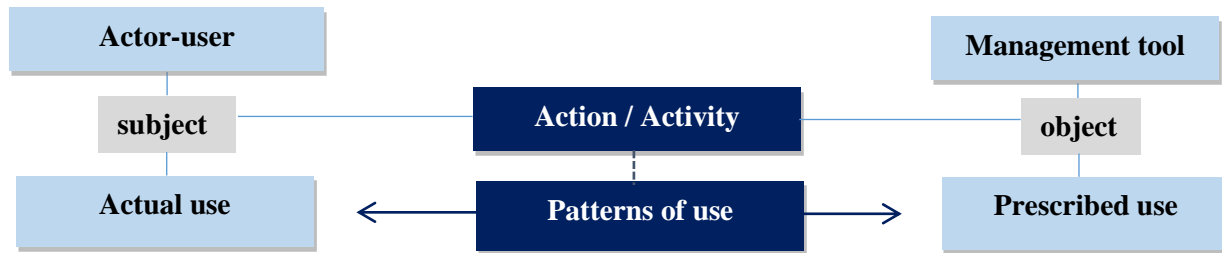
These works have contributed to legitimizing a psycho-social understanding of management tools, implying a paradigmatic break from rational theories. This new perspective has initiated research (Orlikowski, 2007; Aggeri and Labatut, 2010; Chiapello and Gilbert, 2013 et 2019) on management tools from an appropriative viewpoint. Here, management tools are not simply designed to standardize behaviors and make them conform but also to promote knowledge and exploration of reality (Moison, 1997) and guide the strategic behavior of actors (Crozier and Friedberg, 1977). This new perspective highlights the dual nature of management tools and prompts a rethinking of how actors use these tools in their organizational contexts (David, 1996) and their impact on collective action.

3 Prospects for the appropriation of management tools

The rational approach allows us to view the management tool as a neutral instrument, devoid of interaction with actors, solely aimed at facilitating objective decision-making. However, new perspectives underscore the interaction between management tools and actors in constructing collective action. Grimand (2006, 2012) emphasizes that "to read management tools from an appropriative perspective is to acknowledge their interactive rationality, to focus on the encounter between the actor and the tool within the context of a unique organization." According to Grimand (2016), "the dynamic of appropriation of management tools allows actors to use them as a support for learning, a vector for reflexivity, and/or a means of identity transformation. This appropriation is necessary to root the tool, so that actors invest it with meaning."

In organizational psychology studies, Rabardel (1997) highlights the strong link between the instrument and the user. According to Rabardel, an instrument is "considered as an intermediate entity, a medium term, even an intermediate universe, between two other entities: the subject, actor, user of the instrument, and the object on which the action is focused" (Rabardel, 1997, p.38), as indicated in Figure 1 .

Fig. 1. Actor-tool relationship.



Source: produced by us

This vision made it possible to understand the effects of the uses of management instruments on organizational dynamics, by introducing new perspectives, beyond the rational gaze, namely the socio-political and psycho-cognitive perspectives. In the same vein, Vaujany FX, (2005) evokes the importance of having a cross-sectional perspective, simultaneously integrating the three perspectives in order to understand the process of appropriating a management tool in all its richness, to know:

- **The rational perspective** views management tools as vectors for rationalizing decision-making and managerial action. This traditional view sees appropriation as a process of simplifying reality (Lorino, 2002) and normalizing and conforming behaviors (Berland et al., 2005; Bouquin and Fiol, 2007).
- **The psycho-cognitive perspective** views the tool as a learning medium. From this perspective, the process of appropriation involves a set of "cognitive mechanisms which consist in adopting a solution or a tool as an answer to a given problem" (Hussenot, 2005).
- **The socio-political perspective** considers the tool as an element of enhancement and structuring of social relations between actors (Crozier M. and Friedberg E. 1977; Reynaud, J.-D., 1988; Vaujany FX, 2006). Appropriation, in this vision, is seen as resulting from the interplay of actors, their ability to seize margins of autonomy, to create coalitions to trick these instruments and, conversely, circumvent them to their advantage.

Alongside these perspectives, Morgan (2012) introduced the fourth perspective of a symbolic nature, which portrays management tools as supporting identity and serving as a means for constructing meaning. This perspective emphasizes the influence of beliefs, myths, and organizational ideologies in the appropriation process. These beliefs fill information gaps, solidify collective action, and contribute to legitimizing actions in the eyes of others (Alter, 2003).

4 The dashboard: towards a management tool focused on ownership

Lebas, MJ (1995), emphasizes that performance only exists if it can be evaluated using a set of measures or indicators. The dashboard thus becomes a performance evaluation instrument capable of integrating both external and internal measures to the organization, including control or forecast indicators. It serves as a tool for steering decisions, particularly in implementing action plans and corrective measures.

Bouquin H. (2001) defines the dashboard as an action instrument where "a few set of indicators (...) are integrated to allow managers to assess the status and evolution of systems they manage and identify trends influencing them over a relevant period." The predominance of the rational perspective is evident in the design and implementation methods of the dashboard. In this view, its strength lies in the technical accuracy it provides to decision-makers.

The appropriation of the dashboard is characterized by a mechanistic representation of the organization, which overlooks challenges such as adaptation to tool-induced changes, actor resistance, and cognitive and political usage limits (Grimaud, 2006, 2012). Indeed, the objective of rationalizing the dashboard, like any management tool, encounters a diversity of rationalities among actors with varying statuses, strategies, and identities. This positivist view of the tool becomes outdated as cognitive elements integrated into the instrument can be applied, ignored, transformed, circumvented, or diverted according to actors' perceptions and concerns. The dashboard loses the rationalizing and homogenous force attributed to it by positivist theory, as it can now be reshaped based on diverse interests, becoming incoherent, unstable, and carrying elements of irrationality, defined by usage patterns rather than predetermined outcomes by designers.

To grasp the underlying logic of the tool, it's crucial to understand its structure within a specific organizational context, involving the actors who utilize it. Hatchuel and Weil (1992) analyzed management tools and presented a framework for understanding their characteristics. According to them, management tools are myths and rational models of knowledge production, with potential material and relational implications. Drawing from their work, we can describe the dashboard as "a unique amalgamation, comprising a formal technical foundation carrying a managerial philosophy and a simplified view of organizational relations." The dashboard comprises three interacting elements:

- **The formal substrate** refers to the tangible or material components essential for the functionality of a dashboard, such as tables, databases, and repositories.

- **The management philosophy** encompasses the behaviors that the dashboard aims to control or promote. It embodies a managerial philosophy where performance is closely tied to providing the organization with a set of indicators for monitoring and controlling activities.
- **The simplified vision of organizational relations** encapsulates the roles played by a limited number of actors, depicted briefly or even caricaturally within the tool's operation (Hatchuel and Weil, 1992). These roles include dashboard designers responsible for its distribution, manager-users of the tool, and subordinates tasked with aligning with its objectives, thereby delineating roles and actor positions.

The vitality of a management tool depends on the collaborative efforts of actors involved in its conceptualization, expansion, and refinement. Designers perceive the appropriation of the dashboard as an optimization process, ensuring regulatory control from a rational perspective. Conversely, actor-users view appropriation as a learning journey to customize the tool for specific uses (psycho-cognitive perspective) or as a sociological trajectory where the tool can either impede or serve their interests (socio-political perspective). Building upon these insights, our empirical study seeks to comprehend the roles and utilization of the dashboard by elucidating the perceptions of actor-users. The perspectives of appropriation of the dashboard: an empirical study.

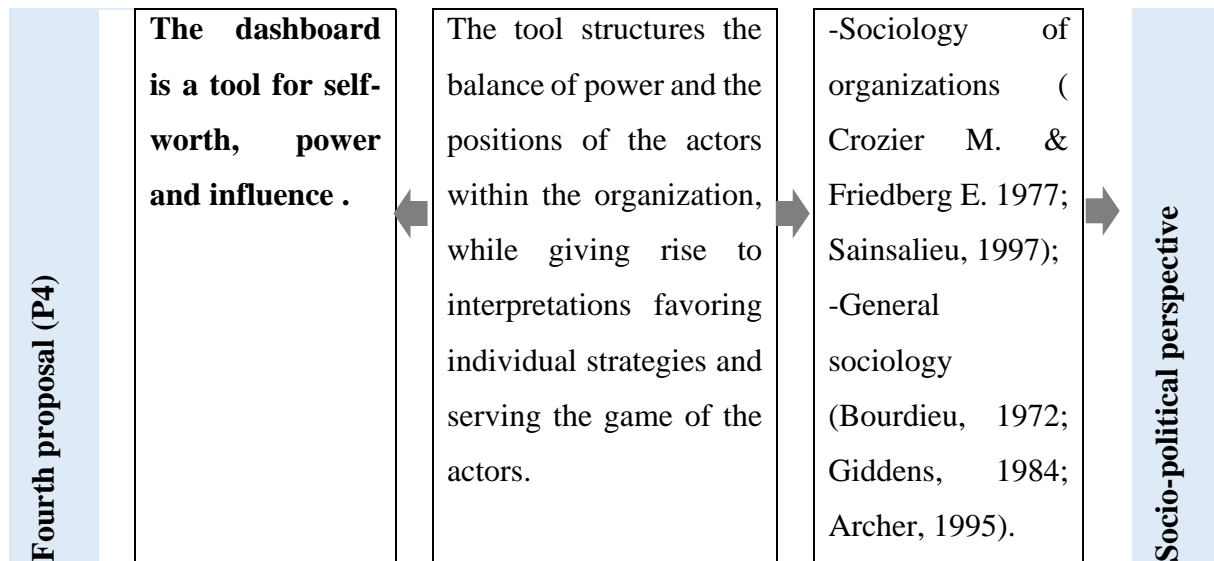
In this empirical segment, we aim to grasp the actors' perceptions during the dashboard's appropriation process, shedding light on the three perspectives: rational, psycho-cognitive, and socio-political, through a study involving three Moroccan SMEs cases.

5 Conceptual model and research proposals

In this article, our aim is to comprehend how the dashboard is perceived by the organization's actors. Given the literature discussed, it is crucial to focus on the actors' perceptions and representations, as well as the significance and utility of the management control tools implemented, as indicated in **Table 1**.

Table 1. Summary of research proposals

First proposal (P1)	The dashboard is a tool for understanding reality and rationalizing the action of the actors.	It assumes that the dashboard is perceived by the actors as a technical and formalized device which serves as a support for the functioning of the organization and which makes it possible to control the action of the actors in order to optimize the processes.	-Classical micro-economic theory: Taylorian and Fayolian theories ; - Moisdon , JC , (1997).	Rational perspective
	The dashboard is a tool that normalizes and standardizes actions and behaviors.	It prescribes that the scoreboard has a role of normalization and standardization of the behavior of the actors, of orientation and piloting of the collective action.	-Classical micro-economic theory: Taylorian and Fayolian theories ; - Moisdon , JC , (1997).	
	The dashboard is a tool that allows to develop or question the cognitions of the actors.	It considers the dashboard as a learning support, it constitutes an element of reflexivity, assimilation and individual and collective accommodation of the actors of the organization.	- Theory of limited rationality Simon 1975; - Cognitive Psychology by Piaget 1967; -Psychoanalytical perspective Pagès et al, 1992; - Vaujany FX, (2006).	
Second proposal (P2)				
Third proposal (P3)				Psycho-cognitive perspective



Source: produced by us.

6 Research methodology and processing of qualitative data

We position our study within the interpretivist paradigm, aiming to interpret the representations that actors within the company construct regarding their actions during the dashboard appropriation process. We believe that these representations emerge from interactions between actors (designers, management controllers, users, etc.) and the implemented dashboard.

In terms of research methodology, we employ a qualitative approach using semi-structured interviews across three business cases. These cases share similar organizational characteristics, minimizing bias stemming from contingency factors as much as possible, as indicated in Table2.

Table 2. Summary of the technical characteristics of the companies studied

Social reason	SA	AM	SC
Purpose	Production and marketing of livestock and poultry feed.	The production and marketing of seeds and multi-species.	The marketing of cereals, legumes, oilseeds and animal feed; carob crushing.
Year of creation	1993	1993	1990
Capital (in MDH)	15 MDH	8 MDH	7 MDH
Effective	54 employees	50 employees	120 employees
Activity area	Industrial sector _Agri-food		

Source: Elaborated by us

Ten interviews, each lasting approximately 40 minutes, were systematically recorded and transcribed. The sample for this survey was selected to encompass a diverse range of professional classifications, including chairpersons and chief executive officers, directors of administrative and financial affairs, management controllers, service or department managers, and supervisors.

Data analysis was conducted using NVIVO software. This process involved identifying and categorizing common and recurring themes within our analysis corpus. Initially, themes emerged from the field during the initial textual analysis, which were then classified based on categories identified in the literature. The table 3 below provides an illustration of this coding process:

Table 3. Crossing list of words encoded by search proposals

Dashboard Insights	Rational perspective	Socio-political perspective	Psycho-cognitive perspective	
Perceptions	A tool that normalizes and standardizes actions and behaviors	A tool for controlling and rationalizing the action of actors	A tool for self-worth, power, and influence	A tool for developing or questioning cognitions
1: A-AE-AM	2	3	4	3
2: M-CAF-SC	2	5	8	3
3: M-CG-AM	1	3	7	3
4: M-CG-SA	2	4	9	5
5: M-DAF-AM	1	3	9	2
6: M-CEO-SC	0	4	6	4
7: M-RE-AM	2	4	3	1
8: M-SA-SA	1	3	8	4
9: M-SC-SA	1	5	6	3
10: M-SRH-SC	1	1	6	1

Source :NVivo 12 release.

7 Results and DISCUSSION: The perception of the actors regarding the uses of the dashboard and the dynamics of emerging appropriation

Firstly, the actors conveyed their interpretations of the practical functionalities of the dashboard, corresponding to the rational roles inherent to the tool. Secondly, they expressed additional connotations beyond its technical aspects, encompassing socio-political and psycho-cognitive dimensions. On one hand, the tool is seen as a channel for personal empowerment, authority, and legitimacy. On the other hand, it is viewed as a platform for learning, assimilation, and behavioral adaptation.

7.1. The dashboard: a tool to simplify action and rationalize

Based on the conducted interviews, it is evident that the dashboard provides actors with a comprehensive overview of their department's performance, along with insights into other departments within the company. It proves to be a valuable tool for evaluating the overall complexity (Lorino, 2002), of daily tasks. Its inherent features enable it to simplify intricate events or situations effectively.

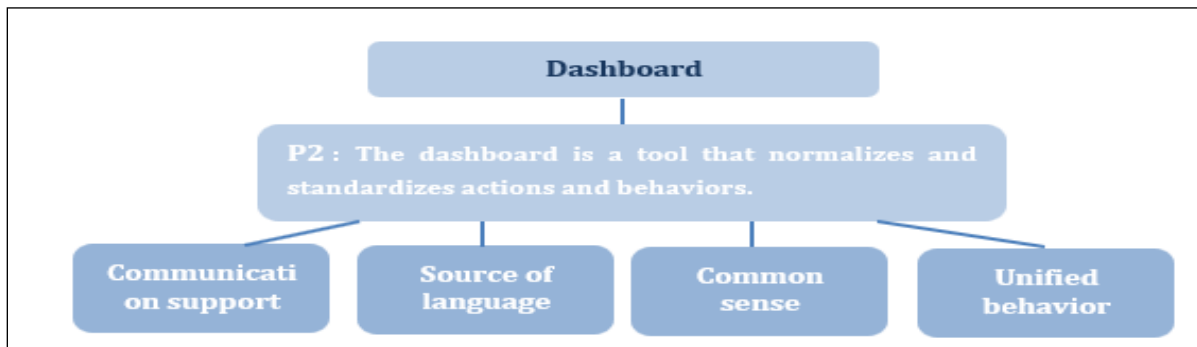
"The company, and all of us, need to have a clear, comprehensive view of the company's evolutions (...). Before the dashboard, the company didn't have the ability to forecast, plan its supply, determine fixed costs, or even evaluate turnover variation and history," stated a manager from M-SC-SA.

The dashboard is frequently seen as a simplification tool that alleviates the complexity of organizational realities. It accomplishes this by offering actionable proposals and recommendations to managers, aiding in decision-making processes (Rocher, 2009). Through consolidating data into a single table, it embodies a management approach focused on objectifying actors' activities. This is achieved by pinpointing specific indicators, enabling a more objective and holistic perspective distinct from individual and subjective user perceptions.

"The data from the dashboard, in my opinion, is reliable. I consider this reliability to be an argument in itself; it is based not so much on personal judgments but on objective data. It is this objectivity that lends legitimacy to the decisions of the person in charge, rather than the person themselves," expressed M-CG-AM.

the deep-seated rational perspective in the actors' representations. They consider it essential to the daily functioning of the studied entities, which are constrained by the imposition of this normative instrumental process. This approach emphasizes the technical construction of the dashboard, where various choices are made to structure the tool and guide users to facilitate its adoption.

Fig 5. Rational perspective.



Source: Elaborated by us

In this context, the dashboard functions as an instrument contributing to the technical regulation of the organization (Bouquin et Fiol, 2007). It serves as a formal repository to which actors refer for decision-making, lending it a certain level of legitimacy.

Moisdon (2005) emphasizes that this rational approach remains very prevalent and continues to be promoted as essential to the daily operations of businesses. The author explains that: "Despite discourses and even awareness, organizations remain anchored in the imposition of solutions and instrumental normativity."

"The dashboard unifies and formalizes people's work, standardizes information sharing, and accommodates different logics coexisting within a single department and across the entire company, which encompasses a wide range of specialties," stated A-AE-AM.

However, several actors have raised concerns regarding the adaptation of the dashboard to pre-existing organizational practices. The analysis highlights two main issues:

- The adaptation and contextualization of the dashboard create challenges within the overall management control system, which includes several other monitoring tools. This situation necessitates changes for the actors, raising questions about their practices,

knowledge, and interconnections. Consequently, the adoption of the tool may proceed slowly due to its need to coexist with other related tools.

- The integration of the dashboard into the organization results in an increased workload. This added workload initiates a process of change and reinvention for the dashboard, aiming to contextualize it effectively within the organizational context.

7.2.The dashboard: a vehicle for learning and behavioral change

The users of the dashboard acknowledge the challenges of cognitive and behavioral adaptation associated with using this tool, confirming the significance of the psycho-cognitive perspective in the appropriation process (Grimand, 2016).

In this regard, actors frequently mention the learning facilitated by the tool in two dimensions:

- A technical dimension wherein a cognitive adaptation process aids in contextualizing and adjusting actors' practices to the tool (Argyris, 2002).

"M-CAF-SC mentioned, 'We managed to use the dashboard in exactly the right way... We relied mainly on self-training to develop our knowledge and learn how to use the tool,'"

However, this assimilation process encounters obstacles due to the emergence of defense mechanisms. In this context, another dimension has surfaced, particularly the political dimension of learning.

- An additional dimension pertains to political learning associated with actor behavior. This form of learning entails transforming interactions among tool users, fostering the adoption of new behaviors. Political learning encompasses actors' recognition of power dynamics and relational complexities inherent in using the tool. Actors acquire skills in negotiation, persuasion, and collaboration to navigate this political landscape.

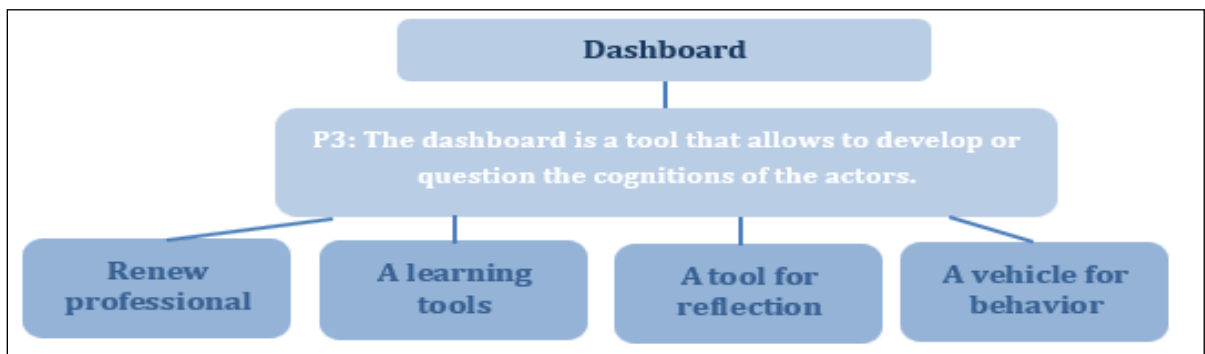
Thus, learning can be viewed as a cognitive shift, as well as an adaptation or behavioral change, as indicated in figures 6 and 7.

Fig.6. psycho-cognitive perspective word cloud.



Source: output, Nvivo 12

Fig.7. psycho-cognitive perspective word cloud.



Source: Elaborated by us

The organization must be able to align the behavior of its members with the objectives of the tool. Therefore, it is necessary to seek to coordinate the "psychological coherence" of individuals (Bourguignon and Jenkins, 2004). The "psychological coherence" arises from the optimal way in which actors perceive and cognitively integrate the tool in question.

7.3.The dashboard: a tool under the socio-political prism

In our study, we have embraced a multidimensional perspective that encompasses various heterogeneous elements such as rationality, learning, representations, and power systems. It is crucial to acknowledge the correspondences and connections woven among these elements.

Our empirical investigation has shed light on the interplay between knowledge and power within the dashboard context. Power generates knowledge, and in turn, knowledge empowers. We seek to understand the knowledge that power has produced and the power that knowledge has yielded, especially in the context of the dashboard as a tool for result control, performance

monitoring, and goal achievement. The dashboard embodies a certain power within itself, implying the generation of knowledge.

Furthermore, actors frequently emphasize the cognitive aspect of the user as a key facilitator in appropriating the dashboard. Thus, the power of the actor stems from possessing socio-technical skills necessary to master the tool, which encompasses technical, political, and relational dimensions. In this context, the dashboard assumes the role of a tool for personal valuation, empowerment, and legitimacy.

M-SC-SA pointed out, "The dashboard provides a certain power to its user; whoever holds the dashboard will have more power compared to others."

However, the dashboard also fosters the creation of interpretative meanings and sparks controversies among the actors (Boussard et Maugeri ,2003). Each actor brings personal nuances, including their social representations and experiences, which are unique to them and contribute to shaping their perceptions and stances regarding the dashboard over time. These perceptions materialize through various behaviors such as acceptance, deviation, obstruction, rejection, or resistance when engaging with the tool.

M-RE-AM remarked, "Even to influence, impact, and change the opinion of decision-makers, we hold meetings and debates, sometimes a real debate, where the one with more arguments succeeds in the decision."

Resistance to the use of the dashboard among actors is frequently associated with a negative perception of the tool. This resistance is evident through individual or collective attitudes and serves as an explicit or implicit expression of dissatisfaction with the changes brought about by the tool. This resistance typically emerges during initial discussions regarding its use, marking the pre-appropriation phase.

"M-CG-AM noted, 'With each change, we encounter resistance. It's not because the new tool or practice isn't relevant, but simply because it creates fear, worry, and misunderstanding linked to the consequences of change.'"

8 Conclusion

This research underscores the limitations of a purely rational and instrumental approach to understanding the adoption of the dashboard in organizations. Analysis of actor testimonies reveals varied appropriation characteristics and confirms the coexistence of multiple rational perspectives: psycho-cognitive and sociopolitical. Users perceive the dashboard as a learning tool and employ strategies that challenge established norms and power dynamics.

Interactions between the dashboard and actors often lead to its reinterpretation, with unintended uses, as it is perceived as a tool that influences legitimacy and power. The appropriation of the dashboard is a process of negotiation between the designer's perspective and the user's needs, evolving within the spaces left open by the designer. Users display creativity in reinventing, adapting, or diverting the dashboard.

However, this research has limitations due to a lack of insight into the long-term effects of using the dashboard, necessitating a deeper analysis of interactions between the tool and actors. Additionally, exploring the essential role of the designer as a key actor in the implementation process, understanding their rationale during design and their influence on tool adoption, would be beneficial.

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