

Emergence of psycho-cognitive and socio-political perspectives during the dashboard appropriation process: The case of industrial SMEs in Morocco

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Abstract: The study aims to explore how the dashboard, initially designed to provide a rational view of organizational complexity, is appropriated by organizational actors in Moroccan Small and Medium Enterprises (SMEs). The process of appropriation is iterative and complex, involving modifications to the artifact dimension of the tool and adaptations by user-actors in their cognitive, behavioral, and social dynamics. The research highlights the psycho-cognitive and socio-political factors influencing the use of the dashboard as a key management control tool. The motivation behind this study is to understand why such a tool can lead to disruptions, resistance to change, contextualization issues, and adoption problems within organizations, rather than fulfilling its initial purpose of rationalizing processes and standardizing behaviors. The research adopts a qualitative approach using the case study method, specifically multiple embedded case studies. The sample consists of three Moroccan SMEs within the industrial food sector. We deemed it appropriate to use a textual data analysis approach, selecting two methods for this purpose: lexical analysis and thematic analysis. The qualitative data analysis was conducted using NVivo 12 software. The findings indicate that the Pre-Appropriation phase creates a context that balances technical and political factors to reduce resistance among stakeholders. The subsequent Original Appropriation Phase involves a collective decision to adopt the dashboard, which can lead to either compliant integration or deviations that enhance user adaptation. Lastly, the Reappropriation phase challenges established routines, potentially resulting in either meaningful transformations or superficial engagement with the dashboard's features. This study demonstrates that the iterative process of dashboard appropriation in Moroccan SMEs, influenced by psychocognitive and sociopolitical factors, can result in resistance, adoption challenges, and unanticipated organizational adaptations and transformations.

Keywords: *Appropriation, Dashboard, Organizational actors, Organizational dynamics, Psycho-cognitive, Socio-political, Rationality,*

1. Introduction

According to the rational approach, the success of a management control tool depends on its technical quality (technical substrate) (Hatchuel and Weil, 1992), which guides the behavior and activities of user-actors in a predictable, standardized, and modelable way. In this approach, only the intrinsic characteristics of the material artifact can justify its dissemination and adoption (Moison, 2005).

However, when a management control tool is implemented within an entity, it often undergoes several successive changes to adjust to the usage context (Grimand, 2016). This process also involves

behavioral adaptation by the user-actors to the changes introduced by the tool (Vaujany, 2005; Muhammad Zawawi, 2018).

The initial objective of a management control tool was to provide decision-makers with a coherent and homogeneous view of the complexity of the organizational situation. However, the tool has become heterogeneous insofar as it is capable of transforming itself according to the diverse interests of organizational actors. As a result, the management tool has lost its rationalizing power and has become incoherent, unstable, and a bearer of irrationalities. Today, it is defined by its patterns of use (Wanda, Orlikowski & Scott, 2008 et 2023) rather than by the results intended by its designer.

The management control tool only exists thanks to the joint action of the players who create, extend, and develop it. This interactive dynamic between actor and tool allows for the emergence of unforeseen and diverted uses, and even unexpected effects on organizational dynamics and collective action.

Several authors have pointed out that the social context in which the tool takes shape is not well understood (Wanda, Orlikowski & Scott, 2008 et 2023; Callon, 1994). A lack of knowledge of the social context can lead to tool failures or adjustments.

More recently, these findings have paved the way for a new approach to management tools in general, and to management control in particular, based on the theory of appropriation initially developed by Vaujany (2005) and further elaborated by Grimand (2005, 2006, 2016). This work has helped to legitimize a psycho-social approach to management tools, representing a significant break from positivist theories and rational approaches (Orlikowski, 2007; Aggeri & Labatut, 2010; Chiapello & Gilbert, 2013)

This new approach prompts us to reconsider the issue of the real effectiveness of the management control tools used by players and the way in which they are appropriated. It highlights the contextual nature of the tool and the evolving nature of its appropriation. In fact, the contextual nature of a management tool is crucial for its appropriation, as its failure can often be attributed to problems of contextualization, particularly when the actual use of a management tool is not adapted to the organizational reality.

Appropriation is considered successful when the series of transformations carried out during the tool's dissemination is well integrated into the practices of the players and, consequently, the organization. Furthermore, the importance of the theory of appropriation lies in the value and significance attributed to the social integration of the uses of a management control tool by the players within the organization. We highlight the importance of the evolutionary nature of appropriation by examining how the tool was designed and continues to be improved through the interactions between the actors and the tool.

From this perspective, the appropriation process comprises three phases, which do not necessarily follow one another: the "pre-appropriation" phase, the "original appropriation" phase, and the "re-appropriation" phase. This process simultaneously activates three perspectives: the rational perspective, the psycho-cognitive perspective, and the socio-political perspective (Vaujany, 2005).

The dashboard, as the management control tool par excellence, follows the same trend. It is a management tool that plays a key role in everyday organizational life, maintaining links with its context (management system, pre-existing technical system, institutional environment) and involving interactions between various organizational players (internal and external). A dashboard is rarely implemented on virgin ground but must deal with contextual dimensions, logics, and operating rules that already exist within the organization.

In this context, the aim of this study is to highlight how the dashboard is subjected to an unpredictable process of interpretation, influence, and construction of meaning, during which the players develop new uses, learn from these uses, and reshape their mode of collective action.

The research question we aim to answer is: To what extent does the process of appropriating the dashboard generate a psycho-cognitive and socio-political process among the organization's players?

To address this question, we will begin by highlighting the key concepts of our research as mentioned in the literature, followed by an examination of the appropriation process of management control tools through a literature review. We will focus our analysis on the three perspectives of appropriation: the rational perspective, the psycho-cognitive perspective, and the socio-political perspective (Vaujany, 2005). Finally, we will present the methodology adopted, the results, and the discussion of our study before concluding.

1.1. Research Objectives

The research objectives highlight the following tasks:

- To contribute to the enrichment of qualitative empirical work on the emergence of psycho-Cognitive and Socio-Political Perspectives during the dashboard appropriation process particularly The Case of Industrial SMEs in Morocco
- To respond to the need for empirical research in the Moroccan context and to explain the emergence of psycho-Cognitive and Socio-Political perspectives during the dashboard appropriation process.

2. Theoretical Framework

The notion of a "management tool" is inherently linked to the concept of management as engineering. In this context, various authors have proposed their own terminologies: "management devices" (Moisdon, 1997; Foucault, 1980), "management instruments" (Gilbert and Berry, 1983), "managerial techniques" (Hatchuel and Weil, 1992), or "managerial devices" (Moisdon, 1994). However, there is no universally accepted generic term for these management tools. Each term is associated with a specific position within a particular research movement and is influenced by the dominant ideology of the time. This proliferation of concepts is due to specific theoretical developments that define an object of varying scope.

Initially centered on a rational approach (Taylor & Fayol), management tools are increasingly shifting towards a social approach (Gourbier, 2020), which places the organization's actors at the center of focus. Research in this area has been fruitful, as it has recognized the importance of this shift. Sociologists have explored the subject, promoting a specific sociological approach to management tools. This reorientation has created new research perspectives based on a more constructivist lens. Under this influence, a new way of looking at management tools, particularly the appropriative approach (Vaujany, 2005), marked a significant departure from rational theories.

Appropriation theory focuses on conceptualizing management tools around more semiotic notions (Hertzog, 2023) such as rhetoric, power, learning, and organizational change (Lorino, 2002; Lorino and Teulier, 2005)

Alongside appropriation theory, we draw upon the Technology Acceptance Model (TAM) and the Theory of Reasoned Action (TRA). The Technology Acceptance Model (TAM), proposed by Davis in 1989, is employed to understand the processes through which users accept and utilize technology. At the conclusion of the dissemination phase, actors can explore the features, benefits, and limitations of the tool. Once accepted, individuals begin experimenting with the tool (Drevetton, 2011). During this phase, the actors test the management tool in real situations and evaluate it in terms of effectiveness, ease of use, and relevance to their work practices.

In appropriation theory, the acceptance of a management instrument implies the willingness of actors to use and integrate a new tool into their daily practices (Gauche, 2013). Acceptance is a pivotal moment in the appropriation process, as without it, the tool risks being used superficially or inappropriately, or even being rejected outright (Gillet et Gillet, 2013; Zawadzki, 2011; Lux, 2015), as indicated in the following Fig.1.

In this context, TAM is a theory that seeks to understand why individuals accept or reject a technology. It posits that the acceptance of innovation depends on individuals' perceptions of its

usefulness (Perceived Usefulness, PU) and its ease of use (Perceived Ease of Use, PEU) (Martineau ,2012; Fikri et Senhaji ,2022).

Similarly, appropriation theory highlights that the acceptance of a management instrument can be influenced by several factors, including:

- Perceived Usefulness (PU): This involves the perception of relevance and refers to the extent to which an individual believes that using the instrument will enhance their performance in a given task or contribute to achieving their goals. If the management instrument is perceived as aligned with the challenges and issues the actor faces, it is more likely to be accepted.
- Perceived Ease of Use (PEU) This refers to the extent to which the actor believes that using the instrument will be straightforward and free of complications. If its use is complex, requires advanced technical skills, or is perceived as time-consuming, it may be less readily accepted.

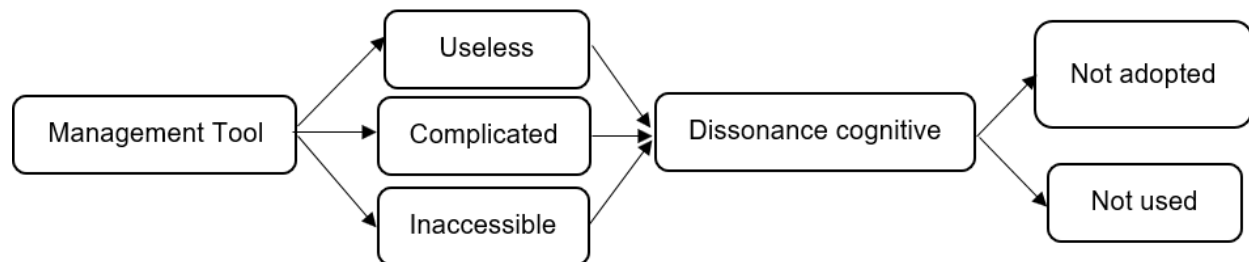


Figure 1.
Perceived usefulness and perceived ease of use of management tools.

In addition, the Theory of Reasoned Action (TRA), developed by Fishbein and Ajzen in 1975, integrates the behavioral dimension of the actor to understand their intentions, which are influenced by their attitudes toward the behavior and subjective norms. The Theory of Planned Behavior (TPB), an extension of the Theory of Reasoned Action, is also important in our research, as it allows us to incorporate additional factors influencing behavioral intentions, particularly perceived behavioral control. Perceived behavioral control reflects the perceived ease or difficulty of performing a behavior. The key elements of this theory include attitudes, which encompass positive or negative feelings toward the behavior; subjective norms, which involve the perceived social pressure to perform or not to perform the behavior; and perceived behavioral control.

2.1. Understanding the Theory of the Appropriation of Management Tools

2.1.1. The Appropriation of Management Tools: a Process of Actor-Tool Interaction

"Appropriation" is a concept that has been widely studied in many branches of the human sciences, such as etymology, sociology, and semiotics. It is also an important subject of research in ICT-related management sciences (Hertzog, 2023; Grimand, 2006; Anton et al., 2021 ; Toki, 2019). "Appropriation" is defined as "the action of attributing or adapting something, both materially and intellectually, to an individual or a group of individuals (Aggeri et Labatut, 2010). The individual will appropriate the object, adapt it to their use, and/or adapt themselves to the object" (Gauche, 2013). Appropriating a tool involves performing an action composed of a multitude of activities, defined as a continuous or discontinuous process, consisting of reciprocal adjustments between the object and the individual, responding both to the needs of the users and to the limits of adaptation (Anton et al., 2021 ; Toki, 2019) as indicated in the following Figure 2.

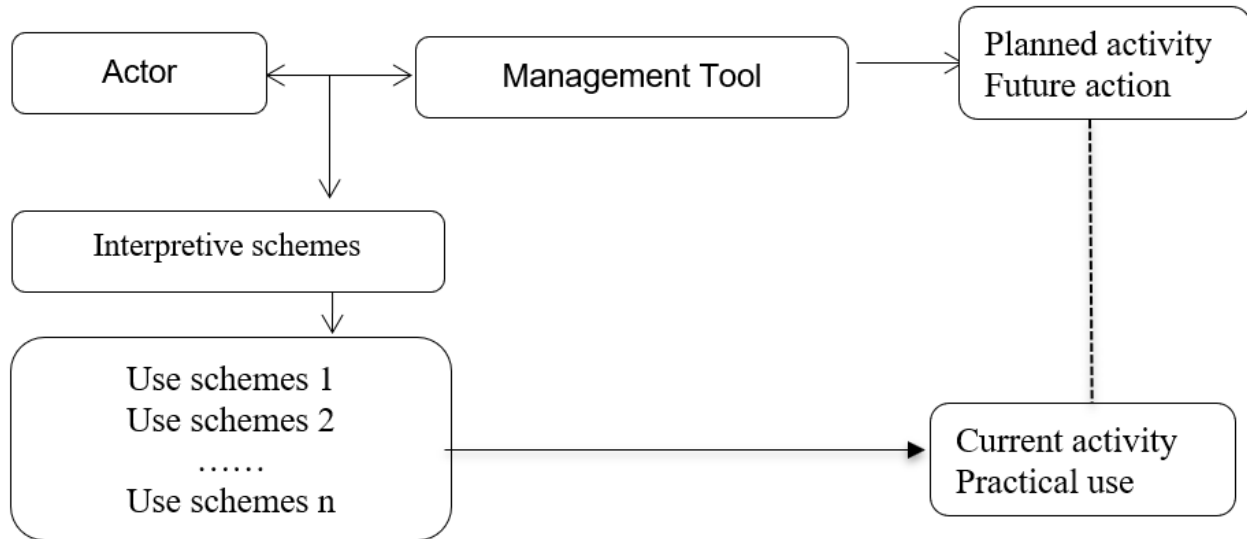


Figure 2.
Usage patterns of a management tool.

In management science, studies on appropriation most commonly focus on the moment when the actor-user is confronted with a new tool and must implement it. We believe that appropriation is a complex phenomenon—an iterative, continuous, or discontinuous process involving interaction between an actor and a new tool from a social construction perspective. This process allows for reciprocal adjustments between the tool and the stakeholder. It involves adapting the tool to better meet the needs of users and changing the (cognitive and behavioral) practices of stakeholders to mitigate contextualization problems. The goal is to ensure the tool's contextualization by achieving stability in organizational routines.

2.1.2. Adopting Management Tools: A Composite Trajectory

The process includes the three phases of appropriation described by De Vaujany (2006) :

Pre-appropriation (also known as "co-design" or "pre-implementation"), begins before the management tool is actually implemented and used in the organization. This co-design phase facilitates exchanges between designers or co-designers and the stakeholders affected by the tool. Although the tool has not yet been implemented in the organization, it is already subject to an initial interpretation by the stakeholders. The tool is perceived, evoked, and designed, but its control is weak, and it is not yet socially constructed (Vaujany, 2006; Brunel and Roux, 2006). This first phase reveals elements of organizational structuring, where the tool initially undergoes minimal acceptance, taking into account the context of use and the different logics of the organization, before achieving collective acceptance, ideally leading to adoption, the objective of this first phase.

Original appropriation, corresponds to the phase during which the tool is introduced into the organization and ends when routines of use emerge. For the stakeholder, this phase marks the transition from becoming familiar with the tool to forming an attitude towards it. The concept of routine refers to the automatic use of the tool and corresponds to its period of stability, as indicated in the Fig.3. Thus, the period of appropriation is ultimately the interval that separates two periods characterized by the stability of organizational routines.

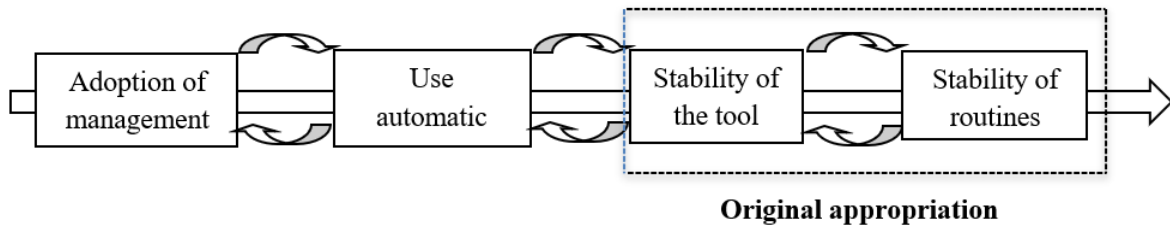


Figure 3.
The original appropriation.

The appropriation process does not end with the establishment of "definitive" routines (De Vaujany, 2005). Appropriation is a dynamic and constantly evolving process that continues throughout the life of a tool. There may be a period of adaptation and exploration during which provisional routines are established. Over time, these routines can evolve into more stable ones that become integrated into daily practices. However, even the most stable routines can be challenged and modified as needs and contexts change.

This leads us to the "re-appropriation" phase. During this phase, each stakeholder can develop their own interpretation of the tool. The mechanisms of reinterpretation, resulting from the use of the tool by the stakeholders, challenge established routines. Actors may employ various improvisation techniques to modify the tool, often in ways that differ from the original intentions (Vaujany, 2005). The tool can then be reinvented and altered by its users. In this phase, the actor is not merely an adopter or rejecter of the tool but plays a pivotal role in its reinvention. This phase corresponds to the evolution of the tool and the creation of new routines by the organization's stakeholders, as indicated in the Fig. 4.

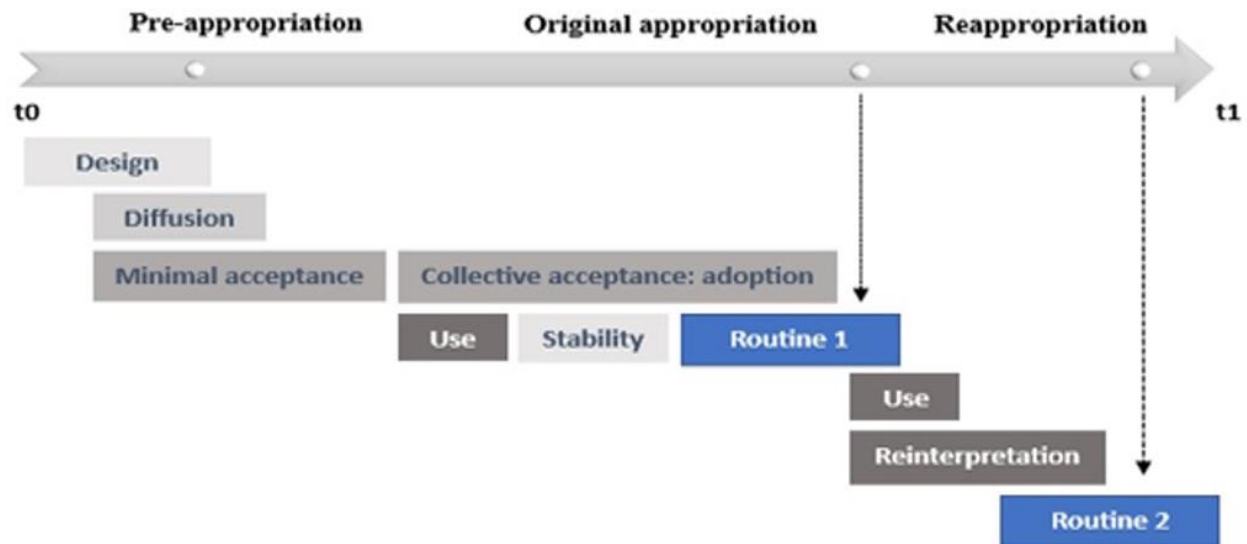


Figure 4.
The ownership process.

2.1.3. Taking Ownership of Management Tools: Different Perspectives

To fully understand the appropriation process, De Vaujany (2006) emphasizes the importance of adopting a cross-perspective approach, integrating three distinct perspectives simultaneously: the rational perspective, the psycho-cognitive perspective, and the socio-political perspective.

The rational perspective, views a management tool as a means of rationalizing management decisions and actions. According to this traditional view, the appropriation of a management tool is seen

as a process that simplifies organizational reality and standardizes the behavior of actors (Lorino, 2002; Bouquin and Fiol, 2007).

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The objective of appropriation theory, as described by De Vaujany (2005), is part of a process of exploring the major theoretical prisms linked to the uses made of management tools by organizational players. It is not limited to seeing this instrument as a simple prescriber of behavior, but envisages a trajectory where the tool becomes a support for individual and collective learning for the players in the organization.

The psycho-cognitive perspective, sees the tool as a learning medium. According to De Vaujany (2005), appropriation theory explores the major theoretical frameworks related to how organizational actors use management tools. This perspective does not limit itself to viewing the tool as a mere prescriber of behavior; rather, it envisions a trajectory where the tool supports individual and collective learning within the organization.

From the psycho-cognitive perspective, appropriation is defined as a set of cognitive mechanisms aimed at using a solution or tool in response to a specific problem (Hussenot, 2005). This perspective allows us to consider the management tool as a learning aid for organizational actors. The introduction of a management tool is viewed as an innovation that triggers learning within the organization. Thus, an interest in organizational learning theory enables us to grasp this perspective and understand the issues associated with the adoption of management tools at both individual and organizational levels.

Learning is seen both as a behavioral adjustment and adaptation to changes in the environment, and as a cognitive change. This duality—between learning based on introduction (the creation of mental representations) and learning based on behavioral conditioning—underpins studies of organizational learning. The approaches to organizational learning adopted here are based on the principles of behaviorist psychology and the cognitivist school of learning.

First, the behaviorist approach treats organizational learning as being based on routines and procedures that are autonomous and independent of individuals. As a result, learning can be measured because it is associated with specific stimuli and the resulting behaviors. The cognitive dimension of learning, according to Newell and Simon (1975), views the human mind as a system for processing information and acquiring knowledge, which is then interpreted, distributed, and memorized within the organization. We make a distinction between behavioral and cognitive aspects, as changes in knowledge within an organization do not necessarily lead to changes in organizational behavior. Furthermore, it is possible for changes in organizational behavior not to reflect a change in the existing representation systems.

Behaviorism studies how the environment impacts the behavior of actors, while cognitivist psychology assumes that human behavior is explained by the content of the human mind and its representations. It emphasizes the need to consider the complexity of the learning subject. Studies in the sociology of innovation show that a tool has no value in itself unless it incorporates the creative capacities of the actors who give it meaning (Alter, 2000). From this perspective, appropriation corresponds to changes in knowledge and behavior brought about by learning (Argyris, 2002).

2.1.4. Understanding the Appropriation of Management Tools Through the Strategic Analysis of Crozier and Freiberg.

The management tool allows for the advance control of stakeholders' behavior, but it is challenging to formalize every aspect. **The socio-political perspective** explains this incompleteness that characterizes the use of such tools. In essence, the actor has two main objectives: on the one hand, to achieve autonomy to avoid the influence of others, and on the other, to act in a way that influences other actors by developing their own tools. In both cases, the actor seeks to use management tools to expand their margin of freedom and avoid being subject to the will of others (Aggeri et Labatut, 2010; Akrich, 2006 ; Martineau, 2012; Chiapello et Gilbert, 2012; Beau, 2017).

Strategic analysis, informed by the contributions of Crozier and Friedberg (1977), explains these power relationships between organizational actors and posits that strategy characterizes the fundamental orientation of an actor immersed in a set of power relationships, which constitute the primary determinant of their behavior. The authors introduced the notion of the strategic actor; in this sense, an actor's ability to adapt to local power dynamics is essential to understanding their behavior. Indeed, these power relationships shape the actor's perception of the environment and influence their actions. Consequently, the power strategy adopted by the actor is a key element in understanding their behavior. Crozier and Friedberg's (1977) strategic analysis asserts that "man always retains a minimum of freedom and cannot help beating the system." The actor is never entirely constrained. Each individual has a "zone of uncertainty" where their behavior can become unpredictable to others. This zone is created by the gaps in the social system, allowing the individual a certain margin of freedom. As a result, the individual attempts to control sources of uncertainty while imposing their way of defining and adjusting actions on others.

Thus, a "knowledge-power" relationship legitimizes the stakeholder's position in relation to the tool. Indeed, knowledge is a vector of power. Mastery of the tool by an individual facilitates peer acceptance of their control and confers undeniable legitimacy. Some actors may perceive the introduction of the management tool as a loss of their privileges and may ultimately question and oppose it. The organization then becomes a continuous movement of issues, actors, and fragile coalitions. A form akin to this is described by Mintzberg (1982) as a "political arena," where actors unfavorable to the tool engage in various maneuvers and manipulations to reduce its impact.

The management tool often provokes resistance among organizational actors. Confusions in existing norms, described as "basic assumptions," lead to the loss of the interests and goals that each actor associates with change. This results in stakeholders perceiving the management tool as a threat. The more divergent the interests of stakeholder-managers and stakeholder-users, the greater the opposition and resistance to its implementation.

2.2. *The Dashboard: A Three-Dimensional Tool*

The dashboard is a management tool for managers to effectively oversee the entity for which they are responsible and to monitor both their performance and that of their organization. Bouquin H. (2001) defines the dashboard as an action tool in which "a set of indicators (...) are integrated to enable managers to become aware of the status and development of the systems they are steering and to identify the trends that will influence them over a time horizon consistent with the nature of their functions."

From this perspective, the dashboard is considered from a purely rational angle, without accounting for factors such as the assigned objectives or the relationships with stakeholders. The predominance of the rational perspective is evident in the way the dashboard is designed and implemented. This perspective suggests that the dashboard derives its power from the technical truth it provides to decision-makers and its ability to control reality (Grimand, 2006).

In practice, however, this positive view of the tool becomes outdated because the cognitive elements that are supposed to be integrated into the tool can be ignored, modified, avoided, or diverted depending on the perceptions of the players and the political issues at stake.

Increasingly, the dashboard is viewed from an appropriation perspective, which considers its nature more comprehensively, describing the tool as "a singular conglomerate, made up of a 'formal technical substrate' carrying a 'managerial philosophy,' and a 'simplified vision of organizational relations'" (Hatchuel A., Weil B., 1992).

- **The formal substrate**, corresponds to the concrete or material elements on which a dashboard relies to function, such as tables, repositories, databases, etc.
- **The managerial philosophy**, corresponds to the behaviors that the dashboard is designed to control or promote. The dashboard embodies a management philosophy in which one of the

essential sources of performance is providing the organization with a set of indicators that enable it to monitor and control its activities.

- **The simplified vision of organizational relations** corresponds to "the roles to be played by a small number of players who are summarily, even caricaturally, described in the operation of the tool." At a minimum, we can distinguish between the designers of the dashboard, who ensure its dissemination, the managers who use the tool, and the subordinates who must comply with its objectives. This delineates the roles and positions of the players involved.

3. Development of Research Proposals

The literature provides a definition and conceptualization of the various phases of the appropriation process, as well as the perspectives involved within a specific organizational context. In this article, we draw on the work of Vaujany (2005), who suggests that the appropriation process consists of three phases: "pre-appropriation," "initial appropriation," and "reappropriation." Our objective is to understand how the dashboard is appropriated by the different actors involved, while considering the rational, psycho-cognitive, and socio-political perspectives that emerge during this process. Consequently, we have formulated the following propositions Table 1.

Table 1.
Explanations of the propositions and theoretical foundations.

Proposals	Explanation	References
Proposal no. 1: The "pre-appropriation" period gives rise to interpretations around the dashboard, while underlining the need to rationalize the action.	The process of appropriation of the dashboard is therefore the result of a game of actors which gives rise to interpretations on the part of the actors, thus favoring individual strategies and supporting the game in the structuring of social relations. (Crozier and Friedberg 1977).	Sociology of organizations, (Crozier and Friedberg 1977), General Sociology (Giddens 1984)
Proposal no. 2: The "original appropriation" phase simultaneously activates the three perspectives of the appropriation of the dashboard: rational, psycho-cognitive and sociopolitical.	In this logic, the appropriation of the dashboard is a process of acquisition of new knowledge by the actors, taking into account the management tool as a trigger for learning. At the same time, the dashboard, as a tool supposed to administer and formalize the organization, allows its manager to have the capacity for action and the autonomy necessary to impose his vision on others. Appropriation of the dashboard by the head of the organization therefore implies that he benefits from more prerogatives and power of control.	Bounded Rationality Theory (Simon 1975) Cognitive psychology (Piaget 1967) Psychoanalytic perspective (Piaget 1967) Sociology of organizations, (Crozier and Friedberg 1977),

Proposal no. 3: The "reappropriation" phase leads to a modification of the dashboard and a transformation of trajectories to promote the emergence of new uses.	Here the actors seek to reclaim the dashboard in order to have room for maneuver and areas of autonomy in its use. The dashboard can be subject to pressure and manipulation from certain actors who question its use in a roundabout way, by modifying the data and information or by adopting a passive behavior which reflects a lack of enthusiasm and an abandonment of all initiative. This can lead to the rapid obsolescence of the dashboard, or its abandonment.	Sociology of organizations, (Crozier and Friedberg 1977), General Sociology (Giddens 1984)
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4. Methodological Approach

The research adopts a qualitative approach through the use of embedded case study methodology, as we aim to observe the perspectives and perceptions of various actors within different organizations, thereby involving multiple units of analysis in diverse contexts. Our motivations for this methodological choice can be summarized in two main points. First, the qualitative approach emphasizes the analysis of words and texts, enabling researchers to explore data that is difficult to quantify while recognizing the value of numerical data. It prioritizes the study of social interactions and realities within specific contexts, using case studies to remain close to participants. Second, the case study method facilitates an in-depth exploration of the interactions between tools and actors, allowing for a comprehensive understanding of appropriation modes while maintaining the contextual relevance of real events. This approach enhances the validity of our findings by highlighting both the similarities and differences among the studied cases. However, this approach does have limitations due to the inherent subjectivity of the researcher, whose perspectives can influence the data analysis process.

The sample comprises three Moroccan Small and Medium Enterprises (SMEs) operating in the industrial food sector. We conducted two types of qualitative data analysis: lexical analysis and thematic analysis. The lexical analysis helped us better define the following question: What stage has each case reached in the process of adopting the dashboard? Our primary objective is to assess the degree of appropriation for each case study and to explore the main themes in greater depth through thematic analysis. This analysis is organized according to a multidimensional framework that allows us to examine the production of three main perspectives related to the process of appropriating the dashboard: the rational perspective, the psycho-cognitive perspective, and the socio-political perspective

4.1. Case Studies

We have chosen three organizations with similar organizational characteristics to ensure they represent comparable cases in terms of appropriation. This selection aims to minimize biases related to organizational differences and facilitate case comparison Table 2.

Table 2.
Case characteristics.

Company name	SA	AM	SC
Purpose	Production and marketing of livestock and poultry feed.	Production and marketing of seeds and multi-species.	Marketing of cereals, pulses, oilseeds and animal feed; carob crushing.
Year of creation	1993	1993	1990

Capital (in MDH)	15 MDH	8 MDH	7 MDH
Workforce	54 employees	50 employees	120 employees
Sector of activity	Industrial sector _Food		

4.2. Introducing the Participants

The survey sample reflects the diversity of occupational classifications¹. The table 03, below summarizes the representation of our sample:

Table 3.

In-depth survey sample and corresponding code.

Maintenance no.	Quality	Gender	Position held	Code granted ²
1	Manager	Woman	Head of Sales	M-SC-SA
2	Manager	Woman	Head of Purchasing	M-SA-SA
3	Manager	Woman	Head of the management control and quality department	M-SQ-SA
4	Manager	Woman	Head of financial affairs	M-CAF SC
5	Agent	Woman	Human resources officers	M-SRH SC
6	DG	Man	Chairman and chief executive officer	M-PDG SC
7	Manager	Man	Director of administrative and financial affairs	M-DAF AM
8	Manager	Woman	Export manager	M-RE-AM
9	Manager	Man	Management controller	M-CG AM
10	Agent	Woman	Sales manager	A-AE-AM

4.3. Results

4.3.1. Results of the Lexical Analysis³

It is the field that reveals the perceptions adopted by the players when faced with the use of the dashboard. By studying the players in situations where they are using the dashboard, the perspectives related to its appropriation should emerge.

In this context, lexical analysis enabled the creation of schematizations of words that explain the system of meanings and ideas in the discourse. This coding facilitated the emergence of data and, where necessary, allowed for the mobilization of concepts related to our research proposal. Qualitative processing was carried out using NVivo 12 software.

The following word clouds provide (Fig.5;6 et 7) insights into the prominent terms and phrases used in the testimonies of the actors from the cases studied: "SA," "AM," and "SC."

The results of the lexical analysis, based on the perceptions of the stakeholders, reveal the following phases (Table 4).

Table 4. Stages of ownership and characteristics for each case study.

CASE " SA : Pre-appropriation phase

The dashboard is external to the company

Communication around the dashboard

Training around the dashboard

¹The sample includes: Chairman and Chief Executive Officer; Director of Administrative and Financial Affairs; Management Controllers; Heads of Service or Department and Supervisors).

² The coding of interviewees consists of protecting the anonymity of respondents

³ Lexical analysis is a method of analysing textual data, based on the premise that the repetition of discourse analysis units reveals the centres of interest of the authors of the discourse (Thiétart et al., 1999, p.493).

Steering meetings around the dashboard
 Consultant support
 Emergence of interpretations
 Desired outcome: Collective acceptance
 The dashboard underwent several modifications before its introduction to the organization

CASE "AM Original appropriation phase

The dashboard is not used by all employees
 Acceptance
 Actual use
 Emergence of learning
 Adaptation to the tool
 Change in practices
 Change in relationships and reports
 Routinization: Initial routines
 Change of the tool

CAS « SC » : Routines organisationnelles 2

Adapting the tool to the context of use

- Changing the dashboard
- Adapting the dashboard to the context of use
- Reinterpretation of the tool
- Changing the first routines
- New routines appear Several changes to the dashboard



Figure 5.
 Word cloud.

This initial phase reveals the need for rationalization and decision-making, with a focus on reshaping organizational structures and dynamics among actors. It may also expose signs of resistance as actors adapt to the changes underway.

- *"Today, we have managed to streamline our methods, aligning them more closely with reality and enhancing our adaptability to the hierarchical system. Additionally, we have shortened the decision-making process." M-SC-SA.*
- *"The issues we've encountered primarily revolve around the implementation of procedures. A new culture has emerged, resulting in resistance from those involved. We've had to invest significant time in explaining the utility of the tool to them." M-CG-SA.*

During this phase, actors perceive the process as somewhat restrictive, feeling compelled to reorganize themselves to adapt to these changes. This transformation of existing organizational dynamics is met with reluctance and caution by the actors. In this context, the dashboard is influenced by user behaviors aimed at limiting its implementation, with some adopting a passive attitude toward the tool.

The dashboard begins to induce organizational changes but is not seamlessly integrated into established routines. Throughout this pre-appropriation phase, the socio-political perspective significantly influences the process. This influence is evident through manipulations, interpretations, and controversies among actors, resulting in individual strategies such as resistance, blockage, and delay, and triggering the restructuring of social relations. New connections and interactions between actors emerge as a response to the changes brought about by the dashboard.

Collaboration between the external consultant (designer) and the users plays a pivotal role during this phase. The organization aims to achieve a minimal level of acceptance by engaging users in the design of the tool, allowing them to identify with it. To attain collective acceptance of the dashboard, the organization considers the contextual factors within the organization, including the perspectives of various stakeholders such as the board of directors, managers, shareholders, and owners.

In this context, effective communication and discourse are emphasized. Formulating questions that promote alignment among the involved actors becomes crucial in guiding them from their individual and isolated positions toward a minimal level of cooperation.

4.3.2.2. Phase of "Original Appropriation" Activating the Perspectives of the Dashboard: Rational, Psycho-Cognitive and Sociopolitical

The original appropriation begins with the collective decision by organizational actors to adopt the dashboard and concludes with the emergence of certain usage routines. Indeed, adoption leads actors from the initial exploration of the dashboard to the formation of an attitude towards it. The concept of routines, meanwhile, refers to the automatic use of the instrument, signifying a period of stability for both organizational practices and the management tool.

At the conclusion of the design cycle, the content of the tool becomes more defined. The trajectory of the tool begins with the interaction between the organizational context and the actors.

This context includes various elements such as the community of actors, the information system, existing tools, current management practices, and the infrastructure.

This phase introduces several challenges, including the need for deeper contextualization of the tool, the iterative relationship between the tool and its users, and the integration of the tool into an existing system of tools and practices. Seamless integration requires careful consideration of how the new tool will coexist with the tools already in use within the organization.

Similar to the perspectives that emerge during the original appropriation phase, two forms of dashboard appropriation can be distinguished:

- **Compliant Appropriation:** In this scenario, the dashboard is accepted and becomes a stable component within organizational routines. It integrates seamlessly into the daily practices of the actors without deviations from the initial usage planned by the organization (prescribed uses).

- **Improper Appropriation:** In some cases, the appropriation process leads to deviations from the intended use of the dashboard. This may involve creative adaptations, do-it-yourself modifications, or the emergence of negative attitudes toward the tool, leading to its rejection, refusal, and rapid obsolescence.

During this phase, which precedes the period of stabilized dashboard use, multiple socio-political and psycho-cognitive processes are activated within the organization. These processes influence how the dashboard is adopted, altered, or rejected, leading to various forms of appropriation:

- **Appropriation as a Process of Acquiring New Knowledge:** The appropriation of the dashboard involves acquiring new knowledge, with the instrument serving as a trigger for learning. The routines associated with using the dashboard stimulate cognitive change among actors .
- *"Personally, I undertook self-training to support the implementation of the dashboard. This tool significantly enhanced my learning process and provided me with valuable information." M-CAF-SC.*
- **Appropriation as a Process of Behavioral Adaptation:** Cognitive adaptation also leads to behavioral change, where actors adjust their behavior to accommodate the new uses provoked by the dashboard.
- *"Getting accustomed to using the dashboard does take some time. Initially, there's a sense of heaviness or burden with each introduction of a new management tool. However, with consistent practice, we gradually become more comfortable and adept at utilizing it." A-AE-AM.*
- **Appropriation as a Regulatory Process:** The tool becomes integrated into the company's culture, allowing for the coexistence of various behaviors and attitudes, and aligning multiple logics of action. This process helps transition from informal attitudes to structured and regularly controlled behaviors.
- *"The dashboard facilitates the sharing of diverse perspectives and reasoning that coexist within a specific department and throughout the company as a whole. This inclusivity enhances collaboration and decision-making processes." A-AE-AM.*

To succeed in this phase, it is crucial to ensure certain conditions are met, including a minimum cognitive mastery of the tool, significant social integration of the tool into organizational practices, and the potential for innovation among actors.

4.4. Reappropriation Phase: A Trajectory of Reinventing the Dashboard towards the Emergence of New Uses

During the reappropriation phase, the fundamental premise is to challenge the usage routines established during the original appropriation phase (Lorino, 2002). This challenge occurs through mechanisms of reinterpretation and reinvention, driven by two essential conditions:

- **Psycho-Cognitive Perspective:** This perspective highlights the importance of the cognitive dimension in facilitating a reflective examination of the usage patterns initially established. Actors recognize the significance of this cognitive aspect as it enables them to reevaluate the knowledge and practices developed during the adaptation to the dashboard's technical constraints in the preceding phase (Vaujany, 2005).
- **Socio-Political Perspective:** This perspective shifts focus to interpretative flexibility, underscoring that the interests of the actors may not always align with those of the organization. Decision-makers often attempt to constrain the interpretations of the actors, while the actors themselves must navigate beyond their comfort zones into a realm of uncertainty. This transition requires actors to abandon old routines, adapt to new contexts, and learn new behaviors. The reappropriation phase can lead to two distinct outcomes (Vaujany, 2005; Grimand, 2006,2016): The first outcome involves the development of appropriation mechanisms through a reinvention of the dashboard, resulting in a more profound transformation of the tool to address pre-existing issues. The second outcome corresponds to a more superficial adoption of the dashboard, often limited to its instrumental use. The reappropriation phase advances through two key conditions: cognitive mastery of the tool and interpretative flexibility.

- **Cognitive Mastery of the Tool:** Actors emphasize the importance of the cognitive dimension, which enables the development of a reflective approach toward the established patterns of use. Routines evolve through an iterative learning process, following an experimental approach. This iterative learning allows actors to revisit the knowledge acquired during the process of adapting to the technical constraints of the dashboard in the earlier phase. This cognitive mastery involves two dimensions:

Modification of the dashboard to better suit the actors, addressing pre-existing issues.

Adaptation of the actors to new challenges that may arise during the appropriation process.

"The dashboard has undergone several modifications as per the director's requirements, prompting questioning and scrutiny on multiple occasions. These modifications predominantly pertain to the data displayed on the dashboard". M-RAF-SC.

"These management tools have undergone multiple updates, especially concerning tax and accounting data, as well as activity levels, often in response to requests from users and department heads. We've accepted their proposals to ensure we have a reliable tool." M-CG-AM.

- **Interpretive Flexibility:** Decision-makers typically attempt to limit users' interpretations of a tool. Meanwhile, during the appropriation process, actors are compelled to break away from their established routines and adapt to new contexts by learning new practices and behaviors. Two scenarios can emerge: In the first scenario, actors generate appropriation mechanisms through a reinvention of the tool. This process involves a profound transformation of the tool and its use, allowing it to address existing issues more effectively. The second scenario involves a more superficial adoption of the dashboard, with usage limited to its basic functionalities.

Throughout the dashboard's usage, actors may encounter challenges necessitating adaptations and adjustments. This requires interpretative flexibility, giving actors room to adapt the tool to their specific contexts. Without such flexibility, the tool may face manipulation or resistance, potentially leading to data manipulation, passive attitudes, or the creation of alternative tools similar to the dashboard.

Maintaining interpretative flexibility throughout the appropriation process is crucial for minimizing errors and ensuring the tool's adaptation to local situations or changing conditions. Balancing interpretative freedom with adherence to prescribed uses is a common theme across all three cases studied, as emphasized in the actors' statements, particularly in the companies "SA" (during the pre-appropriation phase), "AM" (in the original appropriation phase), and "SC" (in the post-appropriation routines).

5. Discussion

In the course of this study, we focused specifically on the appropriation of the scorecard implemented in the three case studies (SA, AM, SC) and the perspectives emerging in each phase of its appropriation: pre-appropriation, original appropriation, and re-appropriation (Vaujany, 2005).

We believe that our analytical framework, centered on the appropriation trajectory of the dashboard, offers a relevant interpretative perspective for the discipline of management control (Hertzog, 2023). It underscores the importance of studying management control instruments within their context of use (Callon, 1994; Wolfe, 1994). What distinguishes our research is the particular attention we have paid to stakeholders' perceptions regarding the use of the dashboard. In analyzing and discussing our results, several key points emerge:

- **Implementation Challenges:** The process of implementing the dashboard reveals appropriation challenges as discussed in management science theories. We found that the dashboard serves multiple roles depending on stakeholders' perceptions of the tool.

- Phases of Appropriation: We examined the appropriation process of the scorecard across the three organizations studied, according to the phases of appropriation (Vaujany, 2005). We confirm that the appropriation process begins even before the organization formally implements the dashboard. It may be initiated through discussions between potential users or interactions between designers and users. This process continues even after the initial user routines appear, often involving adaptations to the dashboard and user patterns for the specific context. This iterative process requires considering the perceptions of all involved, particularly those of the designer, who aims to generate immediate interest in the dashboard the users, who are engaged in adaptation and learning; and the managers, who are concerned with rationalism and conformity.
- Stakeholder Perspectives: The stakeholders in the entities consulted were largely in favor of the prescribed functions of management control tools in general, and the dashboard in particular. They view these tools as means for formulating action proposals and recommendations to assist managers (Camous, 2020) in their decision-making processes.

We then highlighted the different perspectives emerging throughout the appropriation trajectory of the dashboard. These perspectives play divergent roles at each phase of appropriation Figure 8.

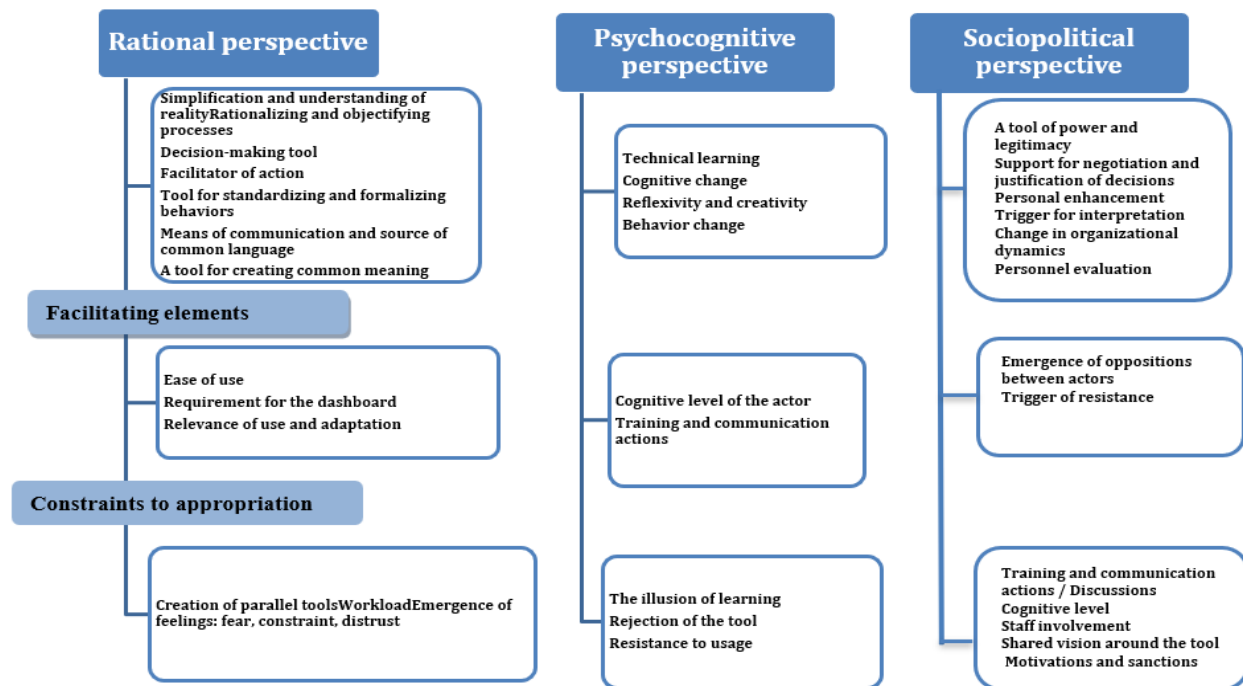


Figure 8. Appropriation trajectory and perspectives.

Firstly, during the pre-appropriation phase, the trajectory begins before the tool is introduced into the organization (Carton et al., 2006). Establishing the context necessary for discussing the scorecard is crucial for framing stakeholders' perceptions of the tool. Organizations seek to improve the control and management system from both technical and political viewpoints. Initially, the view is primarily technical and material (indicators, measurements, data, etc.), but it also involves a political perspective. This is because translating stakeholders' objectives into quantitative measures requires collaboration to determine their needs for steering and managing their work. Moreover, stakeholders often have divergent goals based on their strategies and motivations. Thus, the challenge is to reconcile these divergent goals and foster cooperation. Managerial tactics such as effective communication and

discussion are critical at this stage to encourage convergence and achieve a minimum level of acceptance of the tool.

Secondly, the original appropriation phase begins with the interaction between the stakeholder and the context (stakeholder community, information system, existing tools, management practices, infrastructure). The contextualization of the tool involves a series of interactions and iterations between the tool and the stakeholders (Brillet, Hulin, and Martineau, 2010). This phase highlights the three perspectives of appropriation simultaneously.

Thirdly, the reappropriation phase challenges the usage routines that emerged during the original appropriation phase through mechanisms of reinterpretation and reinvention (Vaujany, 2005) (Fig.9.)

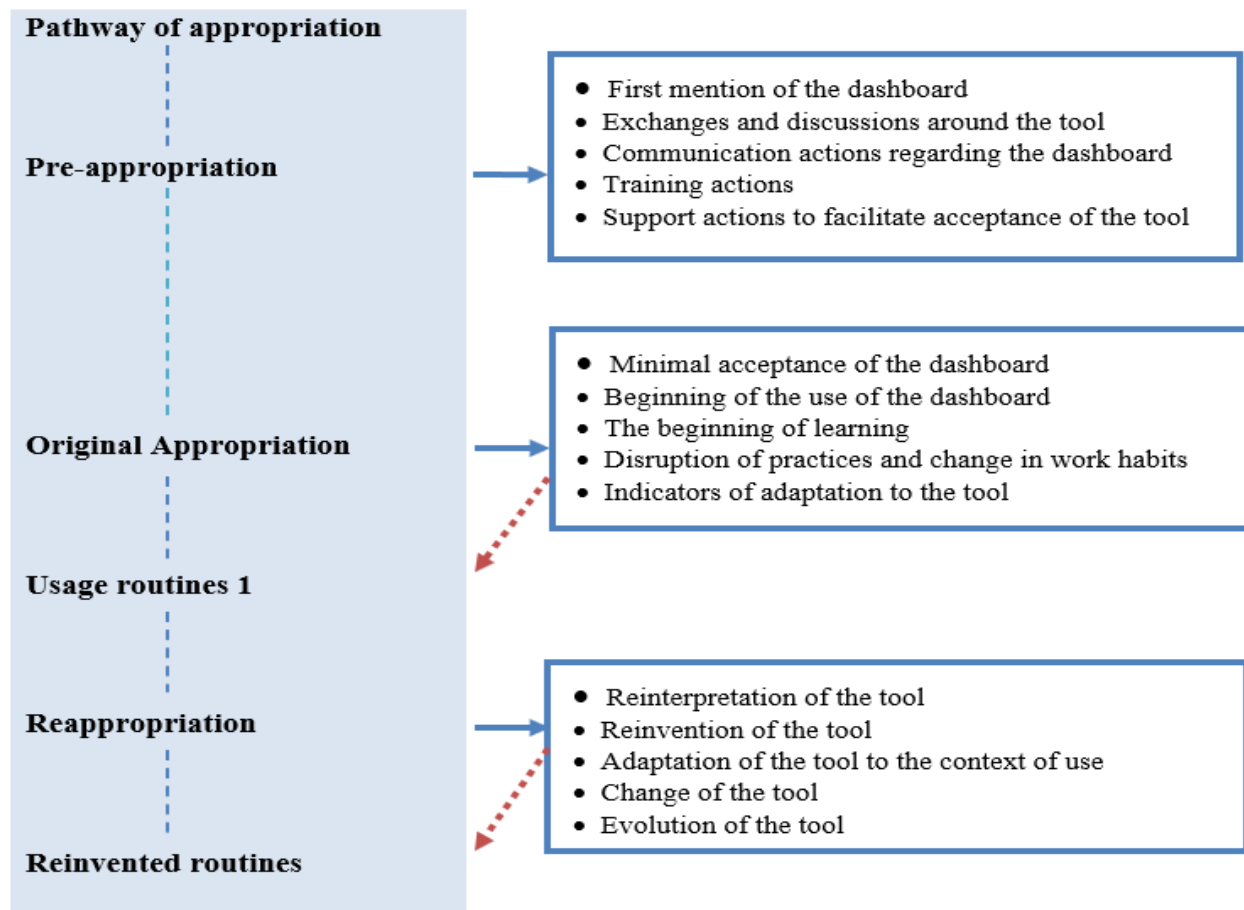


Figure 9.
Description of the appropriation trajectory.

This process unfolds under two conditions. The first condition involves the psycho-cognitive perspective, where stakeholders often emphasize the cognitive impact as a key factor that facilitates and encourages a reflective examination of the initially established usage patterns (Grimand, 2006). The second condition pertains to the socio-political perspective, which underscores the importance of interpretative flexibility. Stakeholders' interests do not always align with those of the organization. Decision-makers frequently attempt to restrict stakeholders' interpretations, while stakeholders are compelled to step outside their comfort zones and navigate a zone of uncertainty. Consequently, stakeholders must abandon old routines, adapt to a new context, and learn new behaviors. In this context, two possible scenarios emerge: the first involves developing appropriation mechanisms through

the reinvention of the tool, leading to a deeper transformation. The second scenario results in a more superficial adoption of the dashboard, characterized by passive use of the tool.

6. Conclusion

The analysis of the dashboard appropriation process reveals a complex dynamic that unfolds through three distinct but interconnected perspectives: rational, psycho-cognitive, and socio-political. From the pre-appropriation phase onward, the contextual framework and stakeholders' perceptions are crucial for the successful introduction of the tool. The initial design phase is marked by tensions between technical imperatives and the necessary political compromises, highlighting the challenge of reconciling technical objectives with the diverse interests of stakeholders.

During the initial appropriation phase, the dashboard must be integrated into an existing system of practices and tools. This phase presents significant challenges, particularly regarding contextualization and adaptation to established practices. The effectiveness of this integration heavily relies on navigating the expectations of various stakeholders and addressing organizational needs. The re-appropriation phase underscores the need for flexibility to allow the dashboard to adapt to evolving organizational contexts. This process can lead to a reinvention of the tool, tailored to the new realities of stakeholders, or result in superficial adoption characterized by manipulation and resistance to change.

Overall, the adoption process of the dashboard is marked by its iterative and dynamic nature. It necessitates careful management of the tensions between technical rationality, organizational learning, and power relations. Success in this process requires maintaining interpretative flexibility while ensuring effective integration into existing organizational practices. This balanced approach maximizes the benefits of the tool while minimizing resistance and inconsistencies in its use.

To deepen our understanding of the subject, a comparative study focusing on multiple cases of the construction and implementation of management control tools could be beneficial, rather than concentrating on a single tool. Such a study should examine the entire process of appropriating management tools using a longitudinal approach to identify common and divergent elements. Additionally, since various management control tools complement and converge within a single managerial framework, analyzing these tools as control packages would account for the complexity of organizational reality (Malmi & Brown, 2006).

Furthermore, it would be prudent to investigate the designer as a key actor in the implementation process of a management instrument to understand the logic and reasoning during the design phase, as these factors significantly influence the post-implementation process and condition the capacity for appropriation. It is also feasible to develop a system to evaluate the level of appropriation of management tools by organizational actors, considering the aforementioned perceptions, roles, and functions. This system should propose concrete solutions at each stage of the appropriation process, including measures or corrective actions to continuously monitor progress.

Future Research

We recommend carrying out the same research based on quantitative methodology and a questionnaire addressed to management controllers and auditors of Strategic Moroccan Public Companies, considered to be a strategic sector which really participates in the creation of wealth in the Moroccan economy.

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