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Cultural Metaphors and KMS Appropriation: Drawing on Astérix to Understand Non-Use in a Large French Company

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ABSTRACT

Management research is increasingly using fiction as an insightful way to analyze complex organizational dynamics. Focusing on user appropriation of Knowledge Management Systems, we describe how we used the popular Astérix cartoon to better understand KMS appropriation. We came to use this approach in an action research project in a large French construction firm initially designed to help Chief Knowledge Officers address KMS non-use. After our first findings showed paradoxical cultural issues, and based on the idea that culture is central to sensemaking and appropriation, we used the notion of the cultural metaphor to help better understand the cultural aspects associated with KMS appropriation. These results contribute knowledge in three different areas. First, we underline the role of cultural metaphors in information systems appropriation. Second, we enrich the literature on the role of fiction in management by illustrating the role of cultural metaphors. Third, we report on how this can be used in an action research project to help better understand KMS appropriation issues, which has the potential of leading to practical managerial action.

KEYWORDS

Knowledge Management Systems, Information Systems Appropriation, Astérix, Cultural Metaphor, Action research, French Organizations, Chief Knowledge Officers

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INTRODUCTION

We focus on Knowledge Management Systems (KMS) use and appropriation in organizations. KMS are a type of Information system (IS) “dedicated to the management of organizational knowledge. They are based on information technologies developed to support and improve the processes of knowledge creation, storage, retrieval, identification, transfer and integration” (Alavi & Leidner, 2001). More recently based on social-based Web 2.0 technologies, such as blogs, wikis, RSSi, Folksonomy or social network platforms, KMS have evolved from knowledge repositories to conversational, collaborative and personal tools to share knowledge, and are known as conversational collaborative knowledge management (Helms, Cranefield & van Reijssen, 2017; Al-ghamdi & Al-ghamdi, 2015; Lee & Lan, 2007; Levy, 2009; Razmerita et al., 2009).

There is a large amount of research on IS appropriation using a range of approaches, e.g. individual use, identity, cognitive mapping, task-technology fit, the technology acceptance model, adaptive structuration, etc. More recent research has shown that technological and organizational factors cannot be separated (e.g. Orlikowski, 1992, 2010; Leonardi & Barley, 2008). A KMS is a sociomaterial assemblage constitutively entangled with work practices. Its technological features, configuration, implementation program, and the context in which it is introduced all influence its appropriation and use (Diedrich & Guzman, 2015; Twum-Darko &

Harker, 2017). KMS appropriation entails important issues of collective sense-making (Orlikowski, 2006) and is intertwined with cultural issues.

Nevertheless, it is still difficult to understand the existing organizational dynamics in relation to KMS use. KMS have strong symbolic and cultural dimensions, which influence their appropriation (Avison, & Myers, 1995; Nonaka & Takeuchi, 1995; Kaarst-Brown & Robey, 1999; Alavi, Kayworth, & Leidner, 2005; Kappos & Rivard, 2008; Jackson, 2011; Dudezert & Leidner, 2011; Abubakre, Coombs & Ravishankar, 2014; Karoui, Dudezert & Leidner, 2015; Jackson, 2016). Knowledge is an abstract concept. In order to manage it, we use metaphors that make it more concrete. Many researchers have pointed out that culture is a source of knowledge sharing (Riege, 2005, You & Liu, 2008) and influences the use of KMS (Alavi et al., 2005). However, practitioners (Chief Knowledge Officers) need to understand organizational and cultural dynamics in relation to KMS use in their enterprise in order to develop appropriate managerial practices. In this paper, we explore how to help practitioners to better understand the organizational and cultural dynamics in relation to KMS use.

We chose to develop this study by using an Action Research (AR) methodology. For several years, we have known and exchanged with a number of Chief Knowledge Officers (CKOs) in various French companies, and for three years with the CKO at Constructor. Constructor (not its real name) is a diversified industrial conglomerate founded in 1952 that employs 54,000 people worldwide. Constructor has been interested in KM since 2005 when they thought it may accelerate knowledge development and acquisition in order to improve their agility in services industries. They developed several systems, including a collaborative knowledge management platform in 2008. In May 2011, the CKO asked us, on an informal research basis rather a consulting one, to help him better understand why, despite technological achievements and largely positive employees' attitudes towards his KMS strategy, KMS were poorly used. This CKO and one of the researchers were members of an industry-academic association created by CKOs from the main large French companies to exchange experiences. The non-use issue was one of the main concerns of this association. Therefore, for several years, CKOs and academics decided to collaborate to explore how to help practitioners to better understand the organizational and cultural dynamics in relation to KMS use in their organizations. It is in this context that we carried out our field study at Constructor.

This paper suggests that, in the context of French firms, *Astérix* can constitute a cultural metaphor (Gannon, 2004) capable of improving the understanding of the KMS appropriation process for French CKOs.

There is a growing literature, which draws on fiction in general and popular fiction such as cartoons to analyze management and organizations (Hassard & Holliday, 1998; Rhodes, 2001; Rhodes & Lilley, 2012; Rhodes & Weswood, 2007; Rhodes & Parker, 2008; Bouville & Barreau, 2018). For example, Fifty Cent & Greene (2009) used the popular songs of rapper *50 Cent* to study business strategy. Czarniawska (2006) used detective novels to analyze gender discrimination in organizations. Griffin, Learmonth and Piper (2018) studied how Disney animations shape children's learning about organizations. Popular culture and fiction can help understand the emotional and symbolic dimensions of subjective experiences of organizational membership (Phillips, 1995) which are not easily accessible through mainstream methodological approaches.

Fiction and culture have featured in some IS research. Examples of particular relevance to our perspective are: Kaarst-Brown and Robey (1999)'s ethnographic work on the cultural analysis of IT as a symbolic artefact open to social interpretation to illustrate how cultural assumptions about IT are implicated in IT management. They employ the metaphor of myth and magic of IT as an interpretive lens to generate five archetypes of IT culture; Kendall (1997) who explores the use of 'computer cartoons' as emblematic and humorous expressions of users and analysts' feelings, attitudes and opinions about IS development and implementation; she concludes that "using and interpreting computer cartoons can assist in assessing expectations surrounding critical success factors whose attainment shapes the design, implementation, and use of information systems in organizations" (Kendall, 1997, 113). More recently, Cranefield et al. (2018) also used political cartoons in the context of IT project escalation. We similarly draw on perspectives that use popular fiction to analyze KMS 2.0 appropriation and use. CKOs we worked with considered that the cultural metaphor of Astérix, a well-known French cartoon that we eventually drew upon half-way through our AR fieldwork, could help them better understand KMS appropriation issues in their own firms.

Our article is organized as follows. We first outline our theoretical background on KMS appropriation, organizational culture and cultural metaphors. We then characterize and present our AR research methodology, followed by our activities and findings. As recommended by AR scholars, we provide as much detail as possible to show the specific context, how we carried out our research, gathered and constructed our data set and progressed from one cycle of activities to the next. In particular, we describe how the Astérix metaphor emerged at the end of the second cycle as a way to progress in better understanding the cultural aspects of KMS non-use at Constructor. Finally, we discuss how our results enrich three existing research areas: KMS appropriation; the role of fiction in management; and how a cultural metaphor can help CKOs better understand appropriation issues and potentially help them develop KMS more congruent with employees' cultural values towards knowledge and its management.

1. THEORETICAL BACKGROUND: KMS Appropriation, Organizational Culture and Cultural Metaphors

Making use of and appropriating new technologies arise from sensemaking resulting from a complex social construction whose outcome is often impossible to define a priori (Pinch & Bijker, 1987; de Vaujany, 2006). Studies more specifically focused on the introduction of KMS (Orlikowski, 1996; Orlikowski, 2000) hold that this sensemaking (Weick, 1995) is essential to appropriating a KMS. These authors underline that when a KMS is introduced, the different practices in and around the technology reproduce or reinforce the firm's social structures. Those structures that hold meaning are particularly modified by the arrival of a new technology. Other works underline the extent to which, when a KMS is introduced into an organization, collective sensemaking around the technology and its associated new modes of action, is crucial for successful implementation (Sellin, 2011; Khalil & Dudézert, 2014). Andriessen (2008, 2011) has shown that employees mobilize metaphors to think and talk about knowledge in organizations. Furthermore, Mason (2003) states that KMS have been criticized as having a North American bias and that the cultural dimension of KMS, particularly the relationship of learning and culture in KM projects, should be investigated further.

Organizational culture is also influenced by employees' national culture. Therefore, many research papers show that KMS appropriation is strongly related to employees' national culture, e.g. Western or Eastern. Martinsons and Westwood (1997) for instance found that Confucian-based values and behaviours distinguish Chinese management systems culture. Martinsons et al. (2009), Lawrence (2013) and Shane (1993) studied the mediating effect of culture on the IS innovation processes which proved useful in describing and explaining the social transformations that enable or inhibit innovation success. Lin (2014) finds that cultural differences impact KMS acceptance. National culture of knowledge workers affects the management of knowledge (Magnier-Watanabe & Senoo, 2010). Ang & Massingham (2007) find there are cultural conditions where KM standardization is appropriate and where adaptation is appropriate. Wei et al. (2008) examine the relationships between national culture and knowledge sharing in virtual teams. Mercier-Laurent (2010) shares experiences of KM in France to better understand cultural influence and points out it is still too 'tool-oriented'. Similarly, Paraponaris et al. (2012) stress the importance of different national cognitive aspects of knowledge. Using a multi-national survey, Furner et al. (2009) explore the extent to which learning preferences are dependent on culture; KMS designs that ignore culture may result in incomplete or ineffective knowledge transfer and learning outcomes. In an experimental study in two individualist (UK and US) and two collectivist (Chile and Mexico) countries, Huerta et al. (2012) study the influence of culture on sharing patterns in KMS.

Much of KMS research investigating national culture draws on Geert Hofstede (1980)'s set of five polar cultural dimensions. For instance, in their study of the influence of national culture on the implementation of KMS, Khudobin, Mansour & Mörtberg (2015) use Hofstede's typology of national traits. This includes the notions of individualist and collectivist features of the national cultures in Europe and Asia, where they find different levels of individualism which affect the KMS implementation process. Similarly, Liu & Porter (2010) find deeply rooted culture traits that work counter to the objectives of a KM program within a Chinese corporation in which information sharing is essential 'counter culture'. Barron and Schneckenberg (2012) explore how national cultural characteristics determine the evolution of Enterprise 2.0 business practices in different countries. They find that Web 2.0 technologies may enjoy faster adoption rates in companies that operate in countries whose national cultures reject power distance, embrace collectivism, and accept uncertainty, which are some of Hofstede's (1980) cultural indices¹.

Hofstede's national culture classification represents a quantitative approach based on cultural stereotypes and archetypes and its conceptualization and influence have been criticized in cross-cultural psychology, organization studies and information systems research (e.g. Kim et al., 1994; Oyserman, Coon & Kimmelmeier, 2002; McSweeney, 2002; Brewer, & Chen, 2007; Kim, 2007; Zhang & Lowry, 2008; Taras, Kirkman & Steel, 2010; Steel & Taras, 2010; Brewer & Venaik, 2014).

The notion of 'cultural metaphor' seems more useful and particularly relevant (Gannon, 2009) to analyze the KMS appropriation process and to help practitioners to understand better the organizational and cultural dynamics in relation with KMS use. Trying to move beyond general

¹ Hofstede's five dimensions of national culture are power distance index, individualism vs. collectivism, uncertainty avoidance index, masculinity vs. femininity, long-term orientation vs. short-term orientation, indulgence vs. restraint.

polar descriptions proposed by Hofstede (1980), Gannon proposes to use the concept of cultural metaphor that he defines as: “any activity, phenomenon or institution with which all or most members of an ethnic or national culture or even a cluster of similar cultures located close to one another (e.g., the Scandinavian nations) identify closely, and to which they react emotionally and intellectually. Some examples are the Japanese garden and the Swedish stuga, a simple, unadorned weekend and summer home” (Gannon & Audia, 2000, 91) or the Fado in Portugal (Nielsen et al., 2009).

According to Gannon (2004), a cultural metaphor’s quality depends on its capacity to:

1. Capture the cultural mindset of a nation in a single image;
2. Provide a framework that incorporates relevant cultural dimensions; and
3. Move beyond the dimensional approach (Hofstede’s indices) to capture values, attitudes and behaviors of the culture otherwise ignored.

During the AR process, we were progressively inspired by these works and concentrated on the figure of Astérix, which strongly articulates the French national character and identity in popular culture and has become a national myth in the last few decades. We are therefore interested here in using this cultural metaphor to assist practitioners in their understanding of the KMS appropriation process in French companies.

2. RESEARCH DESIGN

2.1 Linear Facilitative Dialogical Action Research

It is often difficult to adopt a traditional methodological approach when faced with research settings which are complex, constantly evolving and reflect ambiguous social phenomena. These require the ongoing physical presence of the researcher in the field and AR is one of the suitable research methodologies (Lewin, 1946; Koshy, 2005; Baskerville, 1999; De Luca et al., 2008; Baskerville & Myers, 2004). As Baskerville and Wood-Harper (1998, p. 1) explain, “action research methods are highly clinical in nature, and place IS researchers in a helping role within the organizations that are being studied”. During this research we were in this position; through past exchanges and contacts with their CKO, we were asked to come into the Constructor organization on an informal research basis to help them investigate their KMS appropriation issues.

Amongst the many possible AR approaches, we chose to implement **a linear process model** (not iterative or reflective, see Baskerville and Wood-Harper, 1998), which entails moving back and forth between practice, data and theory to progressively deepen the analysis of a complex phenomenon. It follows a single sequence of activities, which was more realistic for the firm in terms of time and resources, and also because we were also planning to involve our own students in the fieldwork. Baskerville & Wood-Harper (1998) refer to the traditional steps of “engage, diagnose, unfreeze, change, freeze, and disengage”. In our case, we initially thought we may be able to ‘unfreeze, change, freeze’ in the traditional sense of recommending and implementing actions to enact change in the field; but instead, it took the shape of ‘engage, diagnose, present

and attend to this diagnostic, change understandings, and disengage', with no immediate action to implement or evaluate. We did not produce recommendations for action and did not implement any changes, as our intervention was not envisaged in this way by Constructor; the CKO was seeking our informal help based on our experiences and reactions in the field rather than formal expertise. We were not consultants nor collaborators in a change program but facilitators.

Our approach therefore is more akin to Baird, Davidson and Mathiassen ((2017)'s "reflective action research" and is **facilitative** in that we facilitate the CKO's self-reflection - not "reflective problem solving", but by gathering employees' assumptions and values about their technology (non)use, the aim was to help the CKO understand better the reasons underlying (non)use. Our initial findings showed a range of paradoxical attitudes. This led us to try to dig further and experiment with the notion of cultural metaphor. Like Baird et al., the CKO's did revise his "related cognitions" about KMS use, he became more aware of users' reactions to KMS through an unusual cultural lens; but he did not "advance assimilation of technology by reflecting on action strategies".

Our approach can also be seen as "**dialogical**" (not "classic" or "canonical") (Mårtensson & Lee, 2004) with researchers as "equal to practitioners" in "one-to-one dialogues". Indeed, there was a long-standing relationship between the CKO and the main field researcher, based on trust and openness.

Being dialogical and facilitative, our approach is not based on the "expertise-collaboration framework" of engaged scholarship (Barrett & Oborn, 2018); although we do see our work with the CKO as based on an "equal footing" and our 'expert' engagement as both "contributory and interactional". We agree with Barrett & Oborn's aim to produce a "wider set of contributions" and believe that we have adopted a "critical distance", and promoted "deeper engagement" for ourselves and the CKO, but not developed "prescience", and achieved "hybrid practices" for action.

Our approach could also be seen as close to action learning (Revans, 2017), in that it is facilitative, "takes up from the start the need to help managers" to search "the unfamiliar", or learn "to pose useful and discriminating questions", and in that "the manager should be able to specify such-and-such a way of resolving their difficulty". However, action learning "deals with the resolution of problems" through the "ability to carry out the solution of the problem as well as to specify that solution", which does not fit our approach. It aims to resolve a well-defined problem, through an identifiable knowledge set, often conveyed through training and educational programs in the work environment, which again is not our case. Likewise, it is not an action case, which according to Vidgen & Braa (1997), combines understanding (interpretation), prediction (reduction) and change (intervention), as we only carried out the first phase of interpretation.

We believe the contribution of our approach falls within the dimension of originality rather than that of utility (Corley & Gioia, 2011, cited in Barrett & Oborn, 2018), and its outcome is revelatory for both researchers and practitioners, rather than practical. Our aim was to suggest a

different way of looking at what was happening in order for company actors to enrich their comprehension and decide how to act for themselves. They did not ask us to contribute to decisions about adoption or evaluate them.

Linear AR methodological guidelines (Baskerville, 1999; Meissonier & Houzé, 2010) suggest following five steps: *diagnosing* to identify the problems the firm wishes to solve; *action planning* of alternative courses of actions to solve the problem; *action taking* corresponding to selecting a course of actions; *evaluating* the consequences of actions; and *specifying learning* of general findings induced from the cycle. The overall process of our action research followed these five phases (although the term ‘action’ refers to activities we undertook rather than field practical actions we recommended or implemented) in three linear cycles corresponding to key steps of the evolution of the understanding of KMS appropriation by Constructor’s CKO and the members of the CKO industry-academic association mentioned in the introduction.

2.2 Research Context and Researchers’ Involvement

Constructor is a diversified industrial conglomerate founded post WW2. It has continually evolved in the French historical and cultural context since. Created in 1952, Constructor started as a building and real estate business. It now operates globally and employs 54,000 people worldwide, half outside France. Constructor doubled its number of collaborators between 2005 and 2013 through international expansion.

It has been interested in KM since 2005 with the view that it would enable faster knowledge development and acquisition in order to gain agility in services industries in which it wants to position itself and grow marketshare. Since 2005, its IT department has deployed knowledge sharing tools for collaborators within the conglomerate. Some technologies developed are an online directory in 2006, a search engine in 2007, and a collaborative working platform in 2008-2012. These various technologies are made available for staff to share knowledge and the company is keen to develop collaborative knowledge sharing practices and for KMS appropriation to take place successfully. When one of the authors was approached to help the company understand why this appropriation was not as successful as expected, this appeared an ideal case to study KMS appropriation dynamics in organizations.

According to the CKO at the time, the company did not measure success in a very systematic manner; they sought users’ opinions in an informal way, mainly at headquarters, and tended to get positive feedback. They also generally monitor usage through their platforms, such as the number and duration of connections and the number of collaborative spaces created, and were aware of the limited use, which is what prompted the CKO to approach the main researcher.

The main field researcher was contacted by the CKO based on her established research credentials in the academic/industry KM community, to which she had contributed seminars, presentations, meetings, discussions, publications in practitioners’ outlets, and she was known for having analysed the introduction of KMS in various large companies, as an academic researcher, not a remunerated consultant. Constructor CKO and the main field researcher were both members of the same industry-academic association of CKOs. It is a common phenomenon

in this country where many practitioners see academics as interesting interlocutors, and perhaps because many large companies were not long ago still publicly owned enterprises and generally have a high regard for academic research. Constructor has many other consultants intervening, but on this occasion, they preferred to engage with academics and were open to research orientated exchanges. Companies are also used to hosting research and postgraduate students during their studies (this is funded and encouraged by the French state) often for long periods. It was seen as natural to bring in students to carry out empirical work.

The main field researcher was simply asked informally to help the CKO understand better why there was non-use of a new KMS. The CKO knew and had a long-standing relationship with this academic and was interested in getting her opinion as a researcher who is known for engaging with practice. No practical deliverable was required by the company, and no payment was involved. Other members of the CKOs association were also concerned about the non-use issue and she exchanged with them periodically. Concurrently, the other authors were involved in analyzing the data, understanding and reflecting on intermediate findings, and developing and designing subsequent activities in the three AR cycles. The data collection and analysis were not prepared in advance, and stages developed in response to exchanges, reactions, discussions, interpretations, frustrations with contradictory data and improvisation, which is why we see our time in the company as dialogical AR. Our researchers' role was dialogical facilitative involvement, i.e. we cooperated with the practitioners but our tasks were distincts: "The task of the researcher is to facilitate or help the subjects with expert advice, technical knowledge and an independent viewpoint. However, the subjects are responsible for determining exactly what interventions will be created" (Baskerville & Wood-Harper, 1998, p. 6)

3. ACTION RESEARCH: ASTERIX AS CULTURAL METAPHOR TO BETTER UNDERSTAND KMS APPROPRIATION

This section intertwines details on the AR itself and the findings to report on the steps we took as closely as possible. In particular, it describes how we brought in the Astérix cultural metaphor, which we had not envisaged at the outset and which emerged in our interaction with the field. The three research cycles are summarized in Table 1.

Table 1 - Action Research Methodology: Three Cycles

	Cycle 1: 9 months February - October 2011	Cycle 2: 2 years October 2011-February 2013	Cycle 3: 6 months January -June 2014
Diagnosing	<u>Objective 1:</u> Exploring how a new KMS (an internal social network) could be appropriated by Constructor employees	<u>Objective 2:</u> Understanding the organizational and cultural dynamics in relation to KMS (non)use in order to formulate new strategic objectives for the KM division	<u>Objective 3:</u> Improving the understanding of the cultural aspects of KMS appropriation at Constructor
	<u>Sources 1:</u> Existing documentation on the KM Program at Constructor	<u>Sources 2:</u> Existing documentation on the KM Program at Constructor	<u>Data Analysis 3:</u> Cycles 1 and 2 data re-analyzed with cultural aspects in mind

	Meetings with the CKO Informal communications Verbal and non-verbal observations	Meetings with the former and the new CKO Informal communications Verbal and non-verbal observations Academic literature	
	<u>Data Analysis 1:</u> Data above analyzed, presented to and discussed with the CKO	<u>Data Analysis 2:</u> Data above analyzed, presented to and discussed with the CKO	<u>Sources 3:</u> Academic literature Astérix cartoons
Action Planning	Identifying users' needs and opinions about a potential new enterprise social network	Reviewing use and appropriation of the whole set of KMS tools deployed since 2005 and propose recommendations by using the KM2P framework	Analysing the cultural specificities of KM at Constructor
Action Taking	26 individual interviews at company headquarters <u>Data Analysis 1</u> with open-coding methodology and NVivo software	17 individual interviews with company employees in the whole company <u>Data Analysis 2</u> with KM2P framework	<u>Re-analysis 3</u> of Cycles 1 and 2 interviews and observation data using the Astérix metaphor
Evaluating	<u>Evaluating 1</u> The specificity of Constructor KM culture claimed by employees in the above interviews was analyzed, presented and discussed during a meeting with the CKO	<u>Evaluating 2</u> Our analysis of the interviews above was discussed with both CKOs during a meeting	<u>Evaluating 3</u> Our cultural analysis of the data above was presented to and discussed with the CKO and the members of the CKO association
Specifying Learning	<u>Specifying Learning 1</u> Constructor employees view KMS as contradictory with their own KM culture and intend to defend their organizational culture.	<u>Specifying Learning 2</u> There is a misfit between the KMS deployment strategy and Constructor specific culture regarding work practices and relations to knowledge. The KM2P methodology helps practitioners to understand organizational dynamics and barriers to KMS appropriation, but it is not sufficient to understand underlying cultural aspects	<u>Specifying Learning 3</u> The Astérix metaphor helps CKOs to better understand and express organizational and cultural dynamics of KM appropriation in their organizations.

The next section presents the detailed designs of the five steps as well as the results for each of the three action research cycles, since the results of one cycle led to the next cycle of engagement with the field. It will refer to the steps for each cycle outlined in Table 1 in bold and within brackets for ease of understanding.

3.1 Cycle 1 - A New Social Network Platform

3.1.1 Design

In February 2011, the Chief Knowledge Officer (CKO) was exploring the possible deployment of an internal social network to improve knowledge sharing. He wanted to understand how this technology could be appropriated by Constructor collaborators to improve their knowledge management practices (**Diagnosing 1, Objective 1**). Social network technologies were of interest for several reasons: Constructor relies on knowledge more than processes; half of its collaborators are based outside France; since 2006 there has been a 25% increase in its number of collaborators; and around 40% of its employees have been with the firm for less than five years. Its workforce is relatively young (20-30 years old) and this age group is enthusiast about using social network platforms in their personal lives so is more likely to expect its employer to offer these tools. Therefore, senior managers were considering deploying such a platform. The CKO contacted one of the authors, as she is generally known in French management circles for her work on KM, has been involved in an industry-academic association on KM and the CKO knew her well.

The CKO provided internal documents and described to us the current situation during several meetings and informal exchanges (**Diagnosing 1, Sources 1**). In these discussions, we were told that existing KMS (online directory, search engine, a previous collaborative platform) were poorly used by collaborators. Together with the CKO we decided to carry out a study to identify users' needs and opinions about a potential new enterprise social network (**Action Planning 1**).

Starting in May 2011 and with a research student who was present during 6 months in the firm, we collected observation data and conducted 26 face-to-face and telephone semi-structured interviews averaging 1 hour (**Action Taking 1**). The main field researcher supervised the student and nurtured deep interactions with the CKO during this period. She also worked with another researcher to improve the data analysis. Our sample consisted of collaborators working primarily at the company headquarters. Most interviewees were familiar with IT such as computer laptops, smartphones, VPN networks, database management systems, internet access tools, etc. The participants were highly educated and held managerial roles and responsibilities such as team or project managers. The CKO recommended that we excluded construction workers from this sample, as they are not given access to KMS tools. Interviewees had various levels of expertise and responsibility and belonged to different age groups; for those with a high managerial status we carried out all interviews in their offices; for younger colleagues, this was carried out in neutral spaces at the headquarters, so physically distant from their workspaces in order to foster trust.

We asked them about their role in the firm, their experiences with the existing KMS, their use of social networks in their professional and personal lives, and their opinions about a potential new

enterprise social network. We transcribed the notes we took during the interviews and carried out a content analysis with Nvivo to code, classify and categorize what was said by the interviewees. We relied on open coding (Corbin & Strauss, 1997) to identify emerging issues in their narratives (**Action Taking 1, Data Analysis 1**).

We then presented our analysis to the CKO and discussed with him our results and the salient features we identified during several informal meetings and one formal meeting. We also explored the theory of symbolic adoption to better understand the potential organizational and cultural dynamics of their KMS appropriation process (**Evaluating 1**) which we presented at an academic conference (Verra, Karoui & Dudézert, 2012) to gain feedback from colleagues. This also eventually contributed to our consideration of cultural metaphors.

3.1.2 Results

One of our main observations is that the prospect of a new collaborative platform provided an opportunity for interviewees to emphasize the nature of work at Constructor: autonomous, entrepreneurial, even lonely; a hierarchical organization where knowledge creation and dissemination happens from personal contacts and exchange of information and know-how through informal networks; these informal networks are built during professional experiences and are often linked to a common educational background (university, engineering school, etc.).

Interviewees describe a Constructor collaborator as an intrapreneur, proud of the company's achievements, and always in search of furthering current achievements. An interviewee expresses this as follows: *"on our building sites, we reshape the world"*. This collaborator sees himself as an expert and considers that *"his value is strongly linked to his know-how and the knowledge he holds"*. He tends not to express the problems he may face and is not open to sharing his knowledge. There is even some *"pride in resolving problems on one's own"*. A collaborator is autonomous but knows how to subtly establish himself as part of his community: *"in traditional companies like ours, results are associated with noise and movement. Remaining invisible is not beneficial to individuals"*.

Constructor is described as a hierarchical organization where knowledge transfer takes place informally through professional networks. Outside these networks, knowledge sharing is not seen as adding value for collaborators: it is not recognized officially so is not supported or appreciated. As an interviewee explains: *"as long as knowledge sharing is not explicitly or officially recognized, collaborators will not invest their time in it"*. Regardless of their age or status, all interviewees talk about *"controlling their own sharing"* of *"serious"* information.

By contrast, KMS processes are highly formalized and traceable; their sharing and dissemination processes are formal and collaborators only contribute minimal information which has to be recorded. Cycle 1 concluded with the realization that Constructor employees view KMS as contradictory with their own KM culture. Organizational actors seem to see the deployment of the social enterprise network as an effort by the company to evolve towards a more openly collaborative organization, clashing with the current autonomous practices which they are prepared to defend (**Specifying Learning 1**).

3.2 Cycle 2 – Formulating New KM Strategic Objectives

3.2.2 Design

Between October 2011 and February 2013, we carried on exchanging informally with the CKO who was working on improving the KM systems but the social network platform project was dropped. We also continued to exchange regularly with other CKOs about their KMS appropriation issues, in the context of the CKO professional association. The Constructor's CKO was moving to another job, a previous collaborator of the CKO was appointed as head of the KM division, and the activities of the KM division were evolving. Several activities were relocated to a Competence Centre. In December 2012 we started discussing the formulation of new strategic objectives for the KM division and the Competence Centre especially and we had informal exchanges with the two CKOs. They expressed a strong wish to better understand appropriation of all KMS at Constructor in order to develop a relevant KM strategy for the following few years. They explained the new context, gave us working documents on the new KM program in progress. We also searched the academic literature on KM strategies (**Diagnosing 2, Sources 2**). To help the CKOs in their formulation of a new KM strategy, we suggested that we reviewed use and appropriation of the whole set of KMS tools deployed since 2005 and propose recommendations (**Action Planning 2**).

Data gathered during this cycle (**Action Taking 2**) consisted in interviewing 17 participants but based on a broader sampling to include directors, assistant directors, business unit heads, technical experts, engineers, site managers and head librarians. 25 participants were contacted by the CKO via email to seek their agreement for interviewing and participation in this analysis and were told of its aim. 17 responded positively and accepted to be interviewed. They were all executives but at different hierarchical levels and were situated in different geographic locations. Face-to-face and telephone interviews lasted 1h on average.

In the context of our university teaching activities on KM and qualitative research methods, we arranged for Master's Degree students to learn data collection at Constructor and helped them prepare interviewing guidelines. Interviewees were asked about their usages, experiences and opinions about all existing KMS at Constructor. We transcribed the notes we took during the interviews. In order to analyze the data, we used a framework (Figure 1) developed by an author of this paper (Knowledge Management Performance Metrics-KM2P) based on several previous KM strategy engagements with fieldwork in various companies (Dudézert & Lancini, 2005; Dudézert, Prével & Sellin, 2016).

This framework is derived from Henderson and Venkatraman (1993)'s classic alignment model. Of course, there is a huge amount of literature on IT strategic alignment, and there are many articles on the alignment of strategy and culture, IT strategy and culture, and strategy and metaphors. Generally, it is difficult to disentangle which of strategy and culture should precede the other (Kaul, 2019). Amar & Romdhane (2019) found "a positive and significant organizational culture's influence on the IS strategic alignment" but claim it is still under-researched. Additionally, Cornelissen, Holt & Zundel (2011) argue that the effectiveness of (...) metaphors in the framing of a change is [amongst others] dependent on the degree to which these frames are culturally familiar to stakeholders". Our broadly based framework simply highlights

the main elements for alignment (organizational culture, enterprise knowledge, the management of organizational information flows, competitive strategy, and KM systems) and helps understand that for KM initiatives to be successful, an alignment necessitates a coherence between these elements. We had used it in earlier work with various large companies in order to support their KM strategy formulation. We thought this framework could help the CKOs reflect on the KMS strategy and suggested to them to use it to help better understand KMS appropriation and its organizational and cultural dynamics.

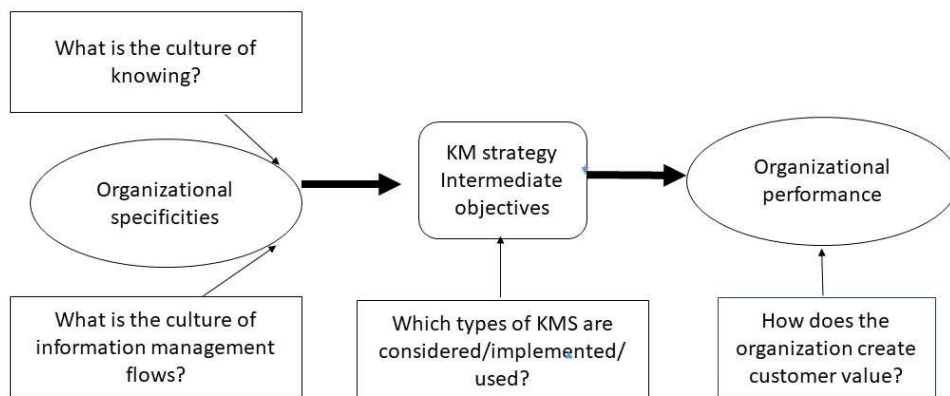


Figure 1. KM2P Framework

We wrote our analysis in a report which we then presented to the two CKOs during a meeting to discuss our conclusions (**Evaluating 2**).

3.2.3 Results

Using this framework helped us to recognize that KMS non-use was due to many organizational issues. For instance, departmental boundaries prevented the sharing of information and knowledge: “*sharing knowledge is not at all part of the fabric of the company. There are still many barriers between departments... information stays within departments*”; “*At Constructor, in the end, we are individualistic...*” We also noticed in interviewees’s answers many complex paradoxes that we found difficult to understand and explain. We provide examples of some of these paradoxes below.

The knowledge managed by Constructor is essentially technical and procedural (codified administrative and financial documents, site folders, business and project files, etc.). Organizational members therefore see KM as routine information management to support retrieving data, getting information from existing and past projects and standardizing work processes; highly structured IS designed by the different business units are used to share these

documents. Employees are happy using them and underlie the quality of these systems: *“Constructor is very well organized in terms of formalizing procedures”*; *“We have a good basis for finding everything... all the documents are available”*. But they don’t use these systems much and interviewees expressed their preference for informal exchanges (face-to-face, telephone, email) rather than using IT to share knowledge. KMS are commonly described by interviewees as *“full of potential”* and *“gold mines”* but they are not used. They are perceived as increasing information load, although this is primarily due to large amounts of email exchanges. Interviewees complain about email overload: *“Because of the numbers of emails I get, if I open one with a link to a system, bearing in mind the time it takes to check out a new IT tool, I cannot be bothered so I close it and I never return to it”*; *“Email is a disaster”*. Still, they prefer this mode of communication to any other knowledge exchange platform: *“We exchange and discuss many topics informally via email or phone conversations”*.

Nevertheless, interviewees advocate knowledge sharing at the level of the whole firm: *“the director and managers should take charge of information flows in their units... if procedures come from the top, this could push different services and collaborators to become aware of the situation”*. On the other hand, they create individual filing spaces, which they may only share with some colleagues and their own business units: *“I back up on my computer and I categorize all the files I find relevant... I must have more than 10,000 files.”*

We communicated our findings to Constructor and organized a meeting with the current and future CKOs to discuss our analysis. They told us that they were aware of these tensions and paradoxes, would try to make use of our findings in their strategic thinking, but did not know how to address these paradoxes. Their frustration was expressed in comments such as: *“whichever action we take organizational actors will not be satisfied”*, *“the main barrier to use is cultural”*, and that they were ill equipped to attend to cultural issues.

The situation seemed to have reached an impasse. The obstacles to KMS appropriation were expressed as cultural issues at Constructor, but we could not fully understand why: on the one hand traditional IS are largely used in the firm, and on the other knowledge sharing does take place informally outside the existing KMS. Moreover, the approach and work of the KM division seemed appreciated by many organizational actors. For example, there was interest expressed by most actors who accepted to be interviewed and who participated in our study with enthusiasm.

Cycle 2 concluded with the finding that there is a misalignment between the KMS deployment strategy and Constructor’s culture regarding work practices and relations to knowledge; however, we could not progress any further in understanding underlying cultural aspects of (non)use (**Specifying Learning 2**).

3.3 Cycle 3 – Cultural Aspects of KMS Appropriation

3.3.1 Design

We were also frustrated that these findings did not provide deeper analytical insights about why KMS were not used throughout the organization. We wanted to help the CKO better understand the origin of the tensions and paradoxes surrounding KMS, and more specifically the cultural

barriers to their appropriation at Constructor (**Diagnosing 3, Objective 3**). We decided to concentrate further on cultural issues to provide a stronger basis for managers to develop their thinking. Our fieldwork observations and interactions over the previous two years had also made us sensitive to the cultural identity of the firm and its employees. Three researchers undertook a content analysis of the material from the first two cycles to explore KMS appropriation dynamics from a cultural perspective (**Diagnosing 3, Data Analysis 3**).

This re-analysis with a focus on cultural aspects of KMS appropriation reminded us of Berry's (2010) "Muxian Chronicles", an experimental research approach developed by the Management Research Centre at Paris Ecole Polytechnique in 1979 (Dégot, Girin & Midler, 1982; Midler, 2010; Bayard, Borzeix & Dumez, 2010) which we revisited (**Diagnosing 3, Sources 3**) for inspiration for further activities and is summarized next.

EDF (Electricité de France) was then the French national electricity company and was exploring the use of IT. Its IT division was asked to design potential scenarios to think through possible future strategies and it invited Ecole Polytechnique to join their project. After initial discussions, they decided to produce scenarios on a fictional basis to imagine IT use at the core of EDF in the future. They produced fictional stories which they then submitted to organizational actors, whose reactions were brutal. They rejected these scenarios, never wanted to hear about them again, and the debate was closed. The IT division and Ecole Polytechnique still continued their thinking and proposed another research approach to EDF. To stimulate debate and understand better why there was such resistance, they suggested inviting employees to project themselves into a different future and co-write short novels. A fictional country, Murcia, was imagined, in which to set these novels. Employees were asked to imagine life in a fictional 'Electricité de Murcia' and speculate on imaginable information technologies to help produce and distribute electricity. This proved very successful and many stories were produced. The experiment inspired organizational actors, freed their imagination and they engaged with debates around IT use. Issues first emerged in writing groups who produced captivating stories, which were then circulated in the company and enabled employees to exchange views and create a collective representation of the place of future IT in working practices. Through imagining a fictional universe together, they could explore how to appropriate IT and they helped researchers understand their IT appropriation process.

The way in which organization is effected and how people operate are accomplished by collective actions, beliefs and imaginations. "A person's approach to organizational life is grounded in an elaborate and largely unarticulated 'meaning map', which provides tools for analyzing situations, beliefs about how things ought to be done and rationales for those beliefs. This meaning map is socially constructed" (Ingersoll & Adams, 1992).

Research has explored the use of fiction to better understand organizational dynamics and the social construction of these meaning maps. Czarniawska (2009) calls for the development of anthropologies of organization through "distant reading" of novels and argues that this can contribute to advancement in approaches to reading fieldwork material. Rhodes and Westwood (2007) argue that representations in popular culture are a legitimate source of material or knowledge from which to conceptualize work and organizational phenomena. Popular culture can be seen as an analytical lens and can constitute in-depth qualitative research on the mediating

effect of culture on IS innovation processes (Lawrence, 2013). Hekkalam, Stein and Rossi (2016) rely on the “power of [cognitive] metaphor (...) for sensemaking” in their research on how IS development project workers justify their actions; and they promote the use of metaphors to “influence action and project outcomes” in IS projects. However, here we use a cultural metaphor rather than cognitive metaphors. Popular culture can provide a cultural metaphor or “frame [for] symbolic principles to create (...) meaning” in IT projects (Cranefield, Oliver & Pries-Heje, 2018). In their research, these authors use political satire to “promote a particular interpretation, evaluation, or solution” to IT project de-escalation; in our case, our aim is just to use a cultural frame to encourage “departure from obvious points of view” in an “engaging and fun” way. And unlike these authors’ research, our CKOs did not expect us to evaluate that this motivated them “to participate more fully in expansive strategic thinking”.

We nevertheless drew inspiration from these research perspectives and from the Muxian chronicles’ experimental approach (**Action Planning 3**). Taking into account the cultural issues exposed during the first cycle, we started thinking about collective cultural images and metaphors which might explain some of the tensions and paradoxes expressed in the second cycle.

Constructor is a large French firm and its history is bound up with French history. During our observations and visits to the firm, we had noticed that employees were proud of this history. Symbols of French history were very tangible such as the architecture of the headquarters building evoking the majesty of the Versailles palace², and prints of statues of the royal Marly-le-Roi³ castle displayed on the walls. These symbols clearly play a role in how Constructor sees itself and reflect its own culture. These observations were confronted to the interviewees’ claims of a cultural specificity and led us to think about national cultural issues. Then the idea to use national images or metaphors emerged in order to try to understand the (non)appropriation dynamics in that context.

At that time in France, a new Astérix album had just been published and was very much in the national ‘psyche’. This popular cartoon has a strong symbolic power for French people, and the fact that the future of these albums was ensured by a new scriptwriter and a new illustrator was highly significant for the French and was celebrated in the whole country. Perhaps the fact that we are French also matters here, as we are in tune with our own national culture, and were brought up with these albums... the French film “Astérix et Obélix”, was the top box-office draw in France in 1999 (Gordon & Meunier, 2001). There is a large amount of literature in French cultural studies on the significance of Asterix. We use here a US popular culture theorist to further illustrate the strong symbolic power of Asterix and emphasize and justify our choice: “To the French, the Gaul is the equivalent of the American frontiersman, whose personal qualities form the basis of the French character and whose deeds provide him with a national folklore [whether] he was born in Strasbourg, Paris, or Martinique (...) the average Frenchman feels kinship with the Gauls, who absorbed their conquerors and created their own unique individualistic culture” (Nye, 1980, p. 184, in an article about the death of Goscinny, the original author of Asterix).

² <http://www.worldreviewer.com/travel-guides/garden/chateau-de-versailles-gardens/10238/>

³ <https://www.france-voyage.com/cities-towns/marly-le-roi-31399/tourist-office-marly-roi-6195.htm>

This popular cartoon was created in 1959 by René Goscinny and Albert Uderzo. Goscinny died in 1977 and Uderzo continued to produce albums. In 2014, Goscinny handed over to two young authors, illustrator Jean-Yves Ferri and scriptwriter Didier Conrad. This provoked huge media interest, newspapers and magazines published special issues, books came out, and academic conferences were organized to discuss the importance of Astérix the Gaul to French culture.

More specifically, research by Rouvière (2008, 2011, 2013) became highly cited; he puts forward that laughter and satire in these albums build on strong stereotypes of the French character and national culture, and argues that the albums provide a social integration device to readers (Rouvière, 2013). We rely on the extensive and well-established work of this prominent cultural sociologist who demonstrates that the Asterix albums constitute a metaphor for French culture. We first briefly summarize Astérix's main components next and their symbolic value, based on his analysis (Rouvière, 2008).

The story takes place in 50BC, just after the Roman conquest. As Gaul is invaded by Caesar's troops, a small village in Brittany resists the Romans thanks to a magic potion invented by their druid. This potion gives superhuman strength to whoever drinks it. The main characters are Astérix the warrior, and Obélix, a menhir deliverer and simpleton but invincible warrior, since he fell into a cauldron of magic potion as child. The village asks them to protect them from the Romans and help anyone resisting the Roman Empire.

The cartoon series rapidly becomes popular, particularly as it taps into the WW2 aspirations of the French people. It encapsulates the ideal of resistance of the little people to imperialisms (the Romans) and totalitarianisms (Goths and Normans). Also representing the protection of individual freedom against all forms of oppression and uniformization, Astérix feeds a new French myth: France not as sovereign in its overseas empire, but as an independent, non-aligned, anti-colonialist and anti-imperialist nation (Rouvière, 2011, 2013). It also carries fundamental tenets structuring French cultural schemes, especially the 'code of honour' proposed by d'Iribarne (1989, 2009). A sign of the strength of the Astérix myth can be seen in the first French satellite launched into space, which bears his name.

The Astérix figure is that of a frank, merry, rebellious and touchy gallo-French, with a strong taste for good food and women (Rouvière, 2013). Its popularity over the years, and its more recent commercial success, its translation into many languages, a film and a theme park, show that its fictional character conveys a strong sense of French identity. As Rouvière (2008) emphasizes: "beyond enjoying its anachronism, readers are drawn into familiar elements which constitute their reference space (...) They playfully engage with recognizing a stereotypical representation of the French, which is loaded with emotional value".

Being French people exposed to this phenomenon at the time, and reflecting on our Constructor findings so far, we came to consider exploring how the Astérix metaphor could help CKOs better understand the cultural aspects of KMS appropriation. Also bearing in mind the successful Muxian experimental research outlined above, we started thinking about a way for CKOs to move away from their familiar company environment and its rationality, in order to grasp at human, symbolic and emotional dimensions of organizational culture.

We read all the Astérix albums and went back and forth between the albums and the cultural elements proposed by Rouvière, concentrating on those which were relevant to cultural issues surrounding KM, in particular knowledge representation and management as portrayed in the Gaul village. We focused on how knowledge is perceived and what are the cultural dynamics around its development, dissemination, sharing and recognition. Next, we organized them into four categories related to KM (individual and collective knowledge, collective project, leadership of collective action, and regulation of collective action, see Table 2) which we subsequently used to reanalyze our Constructor empirical material. Our aim was to develop an analytical grid about KM in the Astérix stories in order to reanalyze (**Action Taking 3, Re-analysis 3**) the data from the first two cycles using the Astérix metaphor. We first present Rouvière's cultural elements which relate to KM.

Firstly, the Gaul village is an anti-elitist world. Nothing separates the elite of those with superpowers from the rest of the tribe. Astérix and Obélix are not heroes, but a couple of villagers who cannot do anything without each other. Asterix is certainly intelligent, but not strong. Obelix is strong, but not intelligent. As for the village chief, Vitalstatix, he is no hero either: although he has the attributes of a true leader, the villagers treat him as one of them. Cacofonix, the bard who claims a musical elitism, is regularly physically gagged for making the distinction between "highbrow culture" and the festive, noisy and popular culture of his compatriots. As for Getafix the Druid, if his wisdom and his magic potion seem mysterious, his vast knowledge and magic powers do not make him a character separate from the rest of the villagers. He is not infallible and his self-satisfaction and inflated ego are rapidly called into question. Thus, in this village, each person's specific knowledge is valued. The villagers respect others' knowledge, but refuse to allow knowledge to become a basis for the superiority of one member of the community over another. As soon as any of the characters take themselves too seriously, they are immediately ridiculed and put in their place.

In the Gaul village, community life is based on common values: convivial and good-natured equality. Individual knowledge is valued, but only in the context of shared circumstances. In the village, conviviality and community respect create knowledge and valued group routines such as banquets, quarrels, making-up, attacks on Romans and the anniversary of the battle of Gergovia, a famous Gaul victory. This knowledge is developed around a shared common project, which is long-term and influenced by fundamental values. The squabbles are ever present, but everyone gets together to defend the common values of equality and respect of freedom from oppression. These shared values uphold the whole village throughout the albums, and this despite changes in its outside environment. The collective is supported by the community structure; there is a strong distinction between those who are both physically and culturally part of this community and ... the others, all the others, who are not part of the Gaul village group. The fence that protects the village's space is significant from this point of view and raises a distinction between the village community and the rest of the world. Thus, the arrival of outsiders such as Geriatrix and his wife in *Asterix and Cesar's Gift*, or Justforkix in *Asterix and the Normans* is not immediately seen as positive. The community needs time to accept other lifestyles.

Secondly, the village refuses to accept any project that is not its own idea. This does not mean that it is hermetically sealed: it does not hesitate to share its values and competences with other

peoples outside Gaul who appear to suffer from absolutist or totalitarian oppression. Given time, the village welcomes members outside the community and respects their integrity. In *Asterix in Corsica*, those who arrive in the village from outside are warmly welcomed to celebrate the anniversary of the battle of Gergovia. Even Caesar and the Romans are not rejected as individuals. For the village, resistance is simply a matter of honour. It is a matter of infuriating Caesar by preventing him from claiming to have conquered the whole of Gaul! Gaulish resistance is not trying to halt the general process of modernity: even the villagers know it is inevitable. However, they want to have time to adapt so that this modernity can be accepted on their own terms and reconciled with their profound values of equality and freedom.

A third feature is the democratically elected Chief (Vitalstatistix); even if he is sometimes ridiculed, he is accepted as the leader. Whenever there is a problem, a meeting takes place in his hut to decide what the group should do. The leader listens to the different protagonists, makes comments based on his knowledge, considers village values and way of life, and then decides what the village should do. Vitalstatistix possesses all the attributes and qualities of a true leader, he knows about the outside political situation, takes responsibility in times of crisis and acts in the collective interest. He possesses the symbols of authority, responsibility and unity represented by his shield and the armchair/throne in his house. In return, the community cannot imagine life without him and when he goes on a health cure for his liver, Astérix and Obélix go with him to make sure he returns safe and sound. In the Gaul village, collective action is never regulated by an individual; it relies on democratically established rules that are respected by all. The Gaul village is not a happy-go-lucky free-for-all where there is no rules. The villager-citizens respect established customs and habits. This is particularly evident in *Astérix and the Big Fight*. Vitalstatistix submits to the rules of electing a leader even if this is not to the village's advantage. The Gauls reject ideas that have not been established democratically. Thus, in *Astérix the Legionary*, Astérix and Obélix enlist in the Roman army to save Tragicomix, Panacea's fiancé. At first, wishing to remain inconspicuous, they accept the jobs they are given. However, when this absurd way of doing things recurs, they spontaneously make use of the French speciality known as "Système D" (D for 'débrouillardise' or getting by). This means getting around any system of rules, or bending them to suit oneself, especially when faced with what are perceived as rules decided undemocratically.

Drawing on these main cultural elements from Rouvière's analysis of the Astérix albums, we constructed the analytical grid in Table 2 to reflect on their relationships to knowledge and knowledge management through four categories: individual and collective knowledge, collective project, leadership of collective action, and regulation of collective action. We then re-analyzed (**Action Taking 3, Re-analysis 3**) Constructor interviews from the first two cycles, recoded them using this Asterix KM grid and drew parallels with knowledge and KM management at Constructor using the Astérix metaphor. We provide some interviewees' quotes in Table 2 to illustrate this re-analysis, and Table 3 summarizes our design for the third cycle of our AR methodology.

Table 2 – Analysis of Cultural Aspects of Knowledge and KM at Constructor using the Astérix Metaphor

Cultural elements based on Rouvière's analysis	Astérix metaphor	Cultural perspective on work practices and relations to knowledge at Constructor	Re-analysis of Constructor Interviewees' quotes
Individual and Collective Knowledge	Village issues and group routines: individuals' own knowledge, respect for their characteristics, everybody considered equal (anti elitism) and collective knowledge building to structure the group and its activities.	Individual issues and group routines (collective, technical and procedural knowledge). Individuals should not make themselves stand out too much.	<p><i>"My status is to do with the information I hold"</i></p> <p><i>"I am proud to resolve problems on my own"</i></p> <p><i>"In some other firms, being seen as successful is to do with making a lot of noise [not here]"</i></p> <p><i>"All technical, financial and procedural documentation is very formalized, on [collective] internal databases, this is what matters the most"</i></p>
Collective project	Upheld by the whole village over the long-term, based on shared fundamental values. Structured around the community but not hermetically sealed off.	Upheld by a group of actors over the long-term, structured around strong community values (teamwork, good workmanship etc.)	<p><i>"The main characteristic of our profession is teamwork and human exchanges"</i></p> <p><i>"I think we have to be careful not to forget our core identity where relations are very important, in the construction industry relations are vital, we need human contact, we need to exchange"</i></p> <p><i>"In our company, in terms of sharing knowledge, human contact is the most valuable"</i></p> <p><i>"We would rather spend time with someone who can explain, not be on our own in front on a screen"</i></p> <p><i>"Over a meal, rather than going through tons of documents posted on a KMS"</i></p>
Leadership of collective action	Lead by a democratically elected chief who assumes responsibility and authority and represents group unity.	Lead by a respected supervisory hierarchical structure.	<p><i>"It is not a matter of just sharing knowledge, it has to be formalized, it has to be controlled to make sure the knowledge is accurate and traceable"</i></p> <p><i>"Transparency is all very well, but If everything is visible to everybody, some departments or teams will try to overdo it to gain prestige or even bonuses"</i></p> <p><i>"If there are problems with employees, e.g. wage issues, they can disseminate negative information through such a social network..."</i></p>

			<i>"There could be leaks to competitors"</i> <i>"We need a clear vision to delineate between personal and professional use of such an enterprise social network"</i>
Regulation of collective action	Democracy: Explicit rules democratically decided in a friendly and neighbourly spirit. Otherwise: "Systeme D" (getting round/bending the rules to suit the purpose at hand and achieve benefits for all).	Procedures: A form of democratic construction of decision-making and action. Explicit controllable rules wished for – which can if necessary be opposed. Otherwise: "Systeme D".	<i>"As long as collaboration [on KMS] is not explicitly recognized or rewarded, I will not take the time to invest in it"</i> <i>"It would need procedures and instructions to standardize knowledge sharing"</i> <i>"Using such a tool can only succeed if it stays focused on our professional work"</i> <i>"There is no support when there are problems (...) we are not sure what the benefits are"</i> <i>"We manage better in my department by creating our own filing systems, they are more relevant to what we need"</i>

Table 3 - Summary of Cycle 3 Design

Action	Sources
Re-analysis of Cycles 1 and 2 data with cultural aspects in mind.	Interviews from Action Taking 1 and 2
Idea of mobilizing a cultural metaphor to help understand KMS non-use.	Berry (2010)
Create an analytical grid to characterize cultural aspects of knowledge management in a French organization, based on the Astérix cultural metaphor.	Rouvière (2008, 2011, 2013) Astérix cartoons (René Goscinny & Albert Uderzo)
Apply this grid to the empirical data from Cycles 1 and 2 .	Interviews and observation data gathered at Constructor in 2011 and 2013 (Action Taking 3).

3.3.2 Results

We presented this analysis at a meeting with the Constructor CKO in July 2014 (**Cycle 3, Evaluating 3**) who expressed strong interest and told us it provided him with explanations about the cultural aspects of KMS non-appropriation that he had not thought of. However, he kept these insights to himself and did not initiate any further activities with us. Using these insights to fix non-use issues would require cultural change in the organization which is a long-term and ambitious program. Besides, the CKO had not asked us to suggest ways to improve the situation.

To pursue this experiment further, and with his agreement, we presented later in 2014 our findings during a meeting of the association of CKOs already mentioned. We presented our analysis of Constructor KM culture using the Astérix metaphor and a large discussion immediately ensued. To our surprise, it was not so much about the Constructor case but about the use of the metaphor to help understand cultural aspects of KMS appropriation in French

companies in general. CKOs described a situation they had experienced which they could understand better through the Astérix metaphor. They stated that the “*metaphor is very truthful*” and said they would use it for debating KMS and KM practices in their organizations. Many participants asked us for further details, such as our written analysis. We were also invited by the CKOs of two other large companies to present our findings during seminars to practitioners. At every event, practitioners stated that our analysis helped them better understand KMS appropriation issues in their organizations. We present below a summary of our presentation to the CKO association workshop and other events, and some of the discussions it triggered.

- We presented our cultural analysis (with PowerPoint slides) at a workshop organized by the professional KM association already mentioned in July 2014. There were 15 CKOs present, from large companies, some French and some international firms with a strong presence in France.
- We first introduced our research and explained our motivation for using the Asterix cultural metaphor. We formulated our question as follows: for firms operating in the French historical and cultural context, how could the myth of the Asterix Gaul village help understand KMS appropriation and (non)use?
- We clarified that our approach was exploratory and had emerged from research with Constructor, and that we were seeking their thoughts on whether it could help them.
- We then described how four cultural dimensions of relevance to KM (see Table 2) are represented in and contribute to the life of the Gaul village: individual and collective knowledge, collective project, leadership of collective action, and regulation of collective action.
- We then showed our analysis of Constructor empirical data along these four dimensions, and drew parallels between the representations of these dimensions in the Gaul village.
- We concluded by making the following points:
 - 1) Our analysis could help understand the gap between KMS strategies and non-use; and that, despite many CKOs’ initiatives such as training, change management etc., there is still a lack of alignment between KMS strategic choices and KMS appropriation and use.
 - 2) Our approach highlights, and raises awareness of, cultural values in French organizations which influence KMS appropriation; and that developing an IT culture is not sufficient.
 - 3) KMS technologies carry meaning, and CKOs may not always be aware of the meaning ICTs carry for employees. ICTs materialize and enact how collective action is envisaged and changed.
- In the discussion following our presentation, many of the CKOs present expressed enthusiasm and below are some of their comments.

“This is spot on. It really helps me put words on what I see and sense”.

“Understanding all this helps me think through what we could do to address non-use”.

“I understand better why users do not share individual knowledge, they are afraid of being seen as putting themselves forward”.

“Or they feel they will be found out for not being knowledgeable enough and be judged”.

“Or they are suspicious of what their hierarchy will do with it”.

Differences between French and Anglo-Saxon attitudes towards knowledge were also discussed:

“Americans willingly disclose any knowledge they have; they may have done two days training on project management, they put that forward to be seen as expert project managers”.

“French people claim to be expert after gaining much experience, or having a degree or official certificate”.

A member of the CKO association had previously expressed his irritation and incomprehension to the main field researcher:

“I don’t understand, I give them a Ferrari and they use it like a handcart!”.

He was the first CKO at the workshop to ask us to come and present our analysis to his company at a seminar on KMS strategy, as he stated that our approach had helped him better understand what he had experienced and could provide a basis for *“thinking through possible avenues”*.

Another issue CKOs raised was whether this analysis could be replicated in international firms. A discussion ensued and some expressed that it could be applied in companies originally French (founded in France or with their headquarters in France), whereas it would be more difficult to apply in global companies. We added that this would possibly require a different and more complex analysis using different and maybe several cultural metaphors.

Applying the Astérix cultural metaphor to KM helped organizational actors recognize cultural aspects of KMS non-use, which they had not fully comprehended before. The Constructor CKO became aware that knowledge and its management may not be perceived and practiced in the same way everywhere - although he had had some intuition but had not been able to articulate it. For example, at the beginning of the KMS deployment, he did not use the English terms “knowledge management” or “knowledge management systems”. He talked about *“partage des connaissances”* (knowledge sharing). He justified to us this wording because of the *“specificities of the Constructor culture”* but he could not explain exactly why. With the Astérix metaphor, he realized that IT implementation and appropriation are deeply intertwined with cultural factors. He became aware that the employees’ national culture influences the way they enact KMS and that KMS convey a way to practice KM that can be in contradiction with these cultural

viewpoints (see Table 4). CKOs in other French companies (members of the CKO professional association) reacted in the similar ways; they were enthusiastic about using the metaphor, which made it possible for them to apprehend cultural aspects they “sense” and face on a daily basis.

Cycle 3 concluded that there is a French specific cultural perspective on KM at Constructor that is in contradiction with the KM practices supported by KMS (**Specifying Learning 3**, see Table 4).

Table 4. Relationship between Cultural Aspects of Knowledge and KM at Constructor and Employees’ Perceptions of KMS Tools

Cultural perspective on work practices and relations to knowledge at Constructor		Employees’ perceptions of KMS implemented in Constructor
Individual and Collective Knowledge	Individual issues and group routines (collective, technical and procedural knowledge). Individuals should not make themselves stand out too much.	KMS expect knowledge comes from individuals seen as “entrepreneurs”, capable of creating knowledge for their own good.
Collective project	Upheld by a group of actors over the long-term, structured around strong community values (teamwork, good workmanship, etc.)	KMS expect projects to be defined according to <i>ad hoc</i> requirements and assume they are structured as a “flat” network.
Leadership of collective action	Lead by a respected supervisory hierarchical structure.	KMS expect actors to organise themselves collaboratively and that the manager is the “leader” of the collaboration.
Regulation of collective action	Procedural: A form of democratic construction of decision-making and action. Explicit controllable rules wished for – which can be opposed if necessary. Otherwise: “Système D”.	Social control: Contractual arrangements among individual “entrepreneurial” actors.

Next, we discuss how our action research approach and our use of a cultural metaphor can contribute to various areas of research.

4. DISCUSSION

4.1. An Emerging AR Methodology

We believe that the originality of our action research is in the unexpected emergence of the use of a cultural metaphor to better understand KMS non-use at Constructor, which proved revelatory for CKOs. This occurred after empirical findings in Cycle 2 proved paradoxical and impossible to comprehend. This led us to finding a more imaginative cultural analytical grid to

try to get at underlying cultural reasons for poor use, which brought a better but more complex understanding of KMS non-use.

Our AR approach is unconventional in that it did not lead to specific actions to address KMS non-use, although it provided CKOs with food for thought for developing “*possible avenues*”. Fixing non-use is difficult. We speculate that a link between a richer understanding and what immediate action could be taken was not obvious to CKOs; they became more aware that issues were related to surrounding cultural attitudes and values, and that these are not easy to change. We would argue that operationalizing an increased cultural awareness of cultural reasons for non-use into practical action is also difficult for organizational actors; and changing organizational culture is notoriously hard to do and often fails as the literature has amply demonstrated (e.g. Burnes & Jackson, 2011; Levy, 2018). Therefore, we couldn’t have validated causality between improved understandings through the use of a metaphor, subsequent action, then KMS use, which are problematic causalities to demonstrate anyhow. What we did after several cycles was more akin to raising cultural awareness, which is also difficult to evaluate and measure.

In our view, although unconventional, this is still a form of AR. It started out as conventional AR, and to our surprise, progressed into a ‘culturally-orientated’ AR. It seems to us that its interest is this very evolution. We chose not to frame this paper as a cultural intervention, in order to keep the authenticity of our field research. We would argue that this authenticity makes a contribution to the role cultural metaphors can play in understanding IS use and their potential relevance and usefulness for IS research.

4.1 Cultural Metaphors and KMS Appropriation

Existing literature has highlighted that both national and organizational cultures are part and parcel of IS appropriation processes (Pinch & Bijker, 1987; Bijker, 1995; Besson & Rowe, 2001; Ngwenyama & Nielsen, 2014; Meissonier & Houzé, 2010; Spee & Jarzabkowski, 2017). We aimed to bring this dimension at the core of the understanding of KMS appropriation in a real setting; and we argue that our approach has the potential of illuminating appropriation issues for organizational actors. More specifically, we propose that cultural metaphors (Gannon, 2004) appear as a valuable way to help actors become aware of cultural issues, articulate them and potentially find better ways of managing them.

At Constructor, our analysis drawing on the Astérix cultural metaphor enabled the CKO to recognize that cultural issues at the core of how knowledge is created, developed and managed in the Gaul village resemble how knowledge management operates at Constructor, and how that resemblance could help reconsider KMS appropriation and use. Using such a cultural metaphor can make us see our everyday context with fresh eyes and address what can be perceived as an impasse; in the case of paradoxes and controversies it can make us “agree to disagree” (Venturini, 2010) thereby unblock a situation and initiate new perspectives on KMS appropriation processes.

Cultural metaphors can be used to think through and communicate about our relationships with KMS: “cultural analyses have considered IT as a symbolic artifact open to social interpretation” (Kaarst-Brown & Robey, 1999). They can relate to what people think of technologies, their relationships with them and whether and how they decide to use them. Metaphors can help diagnose KM problems in organisations and what we develop as KM solutions (Andriessen, 2008). Metaphors can be seen as thinking devices to help how we think and talk about the concept of knowledge (Andriessen, 2011). Furthermore, through our exploration of a KMS implementation, we show that cultural metaphors can help formulate controversial viewpoints about the sociomateriality of KMS (social and material rules and processes, how knowledge is created and exchanged, the nature of expertise, etc.) which are often tacit in everyday work. Cultural metaphors can help organizational actors overcome a latent sense of isolation when faced with new KMS, express their dissatisfaction, put words on their problems, on what causes controversy, disagreements, tensions and dissent, start debating and potentially address and resolve them.

In this perspective, it would be interesting to carry out additional work on the role cultural metaphors can play in the resolution and closure of controversy. Unfortunately, we could not gather further empirical evidence about closure in our fieldwork. Other researchers have explored related conversational approaches in IS project implementation (Mastrogiacomo, Missonier & Bonazzi; 2014; Missonier, 2016) drawing on managerial conflict resolution literature which has found that frequent contacts and communication quality have a calming effect.

This also leads to further questions about KM in multinational firms, particularly whether appropriation issues are only related to cultural issues, and how to identify different types of cultural issues, possibly with the use of several cultural metaphors.

4.2 Cultural Metaphors and Organizational Culture

We also found that using a national cultural metaphor such as Astérix can enrich local understandings of knowledge management in a specific organizational culture. When an organizational culture does not provide a common framework for employees to deploy collective and meaningful action – in our case KMS appropriation – we found that a cultural metaphor which draws on national culture can overcome this problem by making sense of collective action and help building a common frame (in our case how knowledge and its management are perceived and practiced by employees of this firm).

Avison and Myers (1995) were some of the first to advocate research on the relationship between IT and organizational culture. This is also evident in how organizational culture continues to be cited as an important factor in the success or failure of IS adoption (e.g. Jackson, 2011). Much work has been done since then, and Kappos and Rivard (2008) carried out an extensive review of the links between culture and IS: culture moderates the relationship between the development process and the characteristics of the IS; culture moderates the relationship between the characteristics of the IS and acceptance and resistance; culture moderates the relationship between the characteristics of the IS and use process; and IS use influences culture. To study the complexity of interplay between culture, the processes of developing and using an IS, and the IS

itself, they propose a model based on three perspectives - integration, differentiation, and fragmentation - that come into play simultaneously and jointly in the development and use processes of an IS. The model allows researchers to position themselves within the cumulative tradition of positivist research. However, Tams (2013) has recently called for more interpretivist and anthropologist approaches for cultural IS research and has defined culture as shared values among the members of a collective.

Our investigation into the use of a cultural metaphor to analyze KMS appropriation issues contributes to this research stream. The national cultural metaphor enrolled employees in a shared organizational cultural space. This re-found shared space triggered debates about core organizational practices threatened by the KMS: the role of hierarchical overseeing, the relationship to hierarchical control, the recognition of knowledge production and dissemination, the effects on processes and procedures, the need for formalized rules, etc. This leads to some interesting questions about the links between IS, organizational culture and the role other cultural images and symbols such as a national cultural metaphor, can play. Organizational members need to build a collective meaning to be able to work together and make sense of the tools they use together. In our case, this collective frame was challenged by the deployment of new IT collaborative tools, and it became dissociated from the firm's practices, culture and objectives. Instead, it was reconstructed through identifying with the national culture (analyzed by us then expressed by CKOs through the Astérix metaphor) to make sense of the reasons for KMS limited use. This poses questions about the evolution of the firm's organizational culture. If our action research intervention, based on the use of a cultural metaphor, could recreate meaning for employees, this raises questions about the alignment between the organizational culture and the firm's strategy. The organizational culture did not support opening up debates and addressing tensions and controversies, necessary for collective action to ensure KMS appropriation.

4.3. Cultural Metaphors and Managerial Action

Our research is also anchored in organizational research on the use of fiction in management. Our findings illustrate how a cultural metaphor taken from popular fiction such as a well-known cartoon creates a common understanding, which can help illuminate a complex organizational phenomenon from a different angle, and lead to initiating debate.

Our findings contribute to enriching this research stream. We show how a popular cultural metaphor can be used as an analytical grid: Astérix is well known and popular with French people and it can therefore constitute an appropriate cultural metaphor. It makes it possible for actors to recognize cultural and organizational characteristics of a phenomenon and collectively frame a refreshing understanding of a place in action. Building this common meaning frame participates in analyzing a situation and its collective dynamics.

Within the KMS appropriation process, the use of a cultural metaphor could move beyond the comparative analysis between the metaphor and a specific situation. In our case, using the Astérix metaphor supported a comparison between organizational aspects of knowledge management in the Gaul village with existing Constructor KMS use practices. This analysis can potentially lead to managerial action. For instance, applying the cultural metaphor to Constructor helped recognize that employees would prefer that knowledge-sharing practices are formalized,

and that people who contribute to specific knowledge production are clearly identified. Currently, their KMS use is minimal because the social network platform relies on informal exchanges, which are mostly invisible to senior management, and does not allow employees to keep control of the dissemination of the knowledge they produce. Applying elements of the cultural metaphor identified specific tensions and paradoxes in KMS use, which can then become a clearer target for managerial action in order to improve appropriation.

This could be combined with similar action-oriented research aiming to overcome appropriation barriers. For example, Ngwenyama and Nielsen (2014) present a longitudinal case study which examines how an IS implementation team designed and enacted a coordinated strategy of organizational influence using “soft tactics” and intermediaries to achieve implementation success. Liu, Wang and Chua (2015) also use organizational influence theory to assess the effectiveness of an IT project team's persuasion behaviors to increase management's cognitive and emotional involvement in the project. Meissonier & Houzé (2010) carried out an action research project in which they concentrated on conflict situations, how to express tacit causes of resistance and how to build compromise to resolve conflict. Adaba and Kebebew's (2017) action research, based on socio-technical systems theory, first qualitatively diagnosed difficulties with a health information system, and developed and implemented a successful intervention to enhance a patient administration system. Finally, and related to KMS, Alarifi (2016) examined the influence of three management interventions aimed to boost participation in enterprise social networks.

CONCLUSION

Our study contributes to the literature by using the concept of cultural metaphor (Gannon, 2009) to better understand KMS appropriation. In the large French firm we studied, KMS appropriation was particularly limited. Astérix, as a cultural metaphor, helped management to better understand this limited use by underlying the distance between the way employees consider knowledge and its management and the way the tool supports it.

Our empirical data illustrate how a cultural metaphor can raise awareness of cultural issues related to KMS appropriation for managers. Our study also enriches the literature on the use of popular culture as an analytical lens to analyze organizational phenomenon and, particularly, IS processes. Following Czarniawska (2009) and Lawrence (2013), we show that popular fiction such as Astérix can help managers to build or rebuild a common frame.

Finally, our last contribution is the emergent development of an AR methodology to explore how a cultural metaphor such as Astérix could be used to intervene in the collective understanding of organizational culture. Our AR design was developed progressively as we interacted with the field, and can be characterized as exploratory and revelatory. This obviously makes our research difficult to generalize. Nevertheless, we hope that its originality and the positive impact on CKOs we witnessed and reported in this paper will inspire others to pursue this line of enquiry in further fieldwork and action research interventions to explore and experiment with similar approaches based on the use of cultural metaphors. This will contribute to further insights and a deeper understanding of the symbolic and cultural dimensions of KMS appropriation.

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