ABSTRACT
This chapter aims to contribute to the ongoing discussion on knowledge at work. We look at how knowledge is transformed across boundaries, amongst people with different epistemologies, and at the tensions that arise when those epistemologies clash. The study is motivated by the phenomenon of analytics. Inspired by the widely promoted business advantages of this technology, organizations jump on the bandwagon and adopt analytics to automate knowledge work and decision making in various organizational processes. However, such a different perspective might disrupt the practices of their employees, who have another perspective on knowledge than the one advocated by analytics. Our study in a telecommunications organization that recently adopted analytics reveals the tensions that arise between analysts (bearing an algorithmic perspective on knowledge and knowing) and account managers (following an intuitive perspective). The business analytics phenomenon provides us with the opportunity to gain deeper understanding of how employees reflect on their own epistemologies, and how their epistemological differences affect their collaboration.
2.1 Introduction

Business analytics has recently received a lot of attention from both academia and industry, as we are entering the ‘big data’ era. The more digitized organizational and everyday activities become, with real-time information streaming to data servers instantaneously, the easier it is to collect vast amounts of data. Wal-Mart for example, every hour collects more than 2.5 petabytes of customer transaction data (McAfee & Brynjolfsson, 2012). Organizations jump on the bandwagon of business analytics, hoping to leverage vast amounts of data that may help them make better informed decisions, by offering them objective insights on how customers perceive their products, how their competitors perform, and so forth. Nowadays, analytics is considered to be one of the major technology trends (Agarwal & Dhar, 2014). The demand for people with data analysis skills has been increasing exponentially (Brown, Chui, & Manyika, 2011), even by creating the new profession of the “data scientist” (Davenport & Patil, 2012). However, a closer look might give a different picture of what happens when organizations adopt business analytics. Surveys have shown that very few organizations manage to fully integrate analytics in their business processes (Bose, 2009; Davenport & Harris, 2007; LaValle et al., 2011), while we still do not know whether managers really change the way they make decisions, or they simply use analytics in their effort to justify their choices.

In this study we take a knowledge perspective on analytics to explain what happens as organizations enact this technology. Evidently, because the technology entails the collaboration among people from different occupational communities, knowledge boundaries exist among those. However, the study of this phenomenon requires us to extend our understanding of crossing knowledge boundaries on the pragmatic level further than research has done so far (Carlile, 2004). The introduction of analytics in the organization is not a mere introduction of another information technology, but may also be seen as the introduction of a new epistemology in the organization, i.e. a new way for the employees of looking at what knowledge is and how it is acquired. As scholars, we have largely been concerned with our own research paradigms. However, when studying knowledge workers, we have not yet advanced our understanding of how they may form an epistemology in their practice. We argue that understanding this can be valuable, especially when members of different communities have to merge their knowing practices in order to carry out the same organizational process. Such a phenomenon can be observed when analytics is introduced in an organization with the aim to automate part of the knowledge work (Newell, 2015). Furthermore, our current understanding of pragmatic boundaries (Carlile, 2002) lies mostly on aspects related to the different interests between groups and the need for making trade-offs, while it has overlooked the epistemological differences between people from different practices. Scholars on IS (Scott & Perry, 2012; Wagner & Newell, 2004) and management (Garud, Tuertscher, & Van de Ven, 2013) have
previously referred to the concept of epistemic cultures (Knorr Cetina, 1999), to acknowledge the existence of epistemic differences between people from different work practices. We continue in this direction, but we move from accepting in theory that different epistemologies exist, to understanding how they are configured in practice and how people cope with different epistemologies. Therefore, we aim to answer the following research question: “How do knowing practices shape epistemologies in the workplace and what happens when organizational members are faced with a new epistemology?”

In order to answer our research question and elaborate theory (Locke, 2001; Vaughan, 1992) on knowledge collaboration across boundaries, we take a process research approach (Langley, 1999) and perform an inductive longitudinal study in a telecommunications organization. The study is performed in the business market division of the company, where analytics was introduced with the goal to improve the sales process. Following a practice-based perspective (Feldman & Orlikowski, 2011), we study how this new sociomaterial practice started intruding the existing practices of the sales employees, who started defending their established ways of knowing. We find that the analysts in their practice follow an algorithmic epistemology, which is fundamentally different from the intuitive epistemology of the account managers. As these epistemologies clash, we observe how tensions evolve between the two groups.

In the next sections we set the theoretical framework of this study. We then present our research methodology and case description, and continue with the analysis of our findings. Finally, we discuss how our study contributes to the current literature on knowledge boundaries and epistemic cultures.

## 2.2 Theoretical background

### 2.2.1 Studying knowledge and boundaries

The rise of the knowledge economy influenced significantly the field of organization studies. Several streams have dealt with the nature and management of knowledge work, such as organizational design, social psychology, traditional economics, and others. Studies on knowledge work and knowledge-intensive organizations (Blackler, 1995) have highlighted the difficulties that many researchers face in defining knowledge (Alvesson, 2001). The past 15 years a lot of researchers within the field of collaboration and coordination have turned their focus on studying knowledge in organizational and work settings from a practice-based perspective, understanding knowledge as a social and cultural phenomenon (Nicolini, Gherardi, & Yanow, 2003). Taking a knowledge perspective in studying work in organizations has helped researchers move further than looking at a simple distinction between tacit and explicit knowledge and analyzing knowledge management activities. Instead, a knowledge perspective offers a lens to look at work and
organizing and may help understand how knowledge is shared among different groups of people, and explain how people from different practices get to collaborate. In other words, a knowledge perspective entails the study of boundaries among different communities (Carlile, 2002), as people from different groups may have different views and understandings, and need a process of translation to collaborate with each other.

The practice lens (Feldman & Orlikowski, 2011; Nicolini, 2012) has played an important role in studying knowledge as situated in historical, social and cultural contexts (Nicolini et al., 2003). By taking a practice-based approach, researchers depart from viewing knowledge as a commodity and take a perspective that looks at knowledge as a process of knowing (Bechky, 2003; Nicolini, 2011). Orlikowski (2002: 252) defines knowing as “an ongoing social accomplishment, constituted and reconstituted in everyday practice”. Nicolini et al. (2003) suggest that “knowing precedes knowledge, both logically and chronologically, for the latter is always an institutionalized version of the former”. Thus, knowledge emerges through participation in a system of practices of ongoing action that are taking place in a context of interaction, mediated by artifacts, and guided by mutually constitutive relations (Feldman & Orlikowski, 2011; Nicolini et al., 2003).

The practice perspective on knowledge and knowing entails that knowledge emerges through situated activity and it is constructed within a social context (Bechky, 2003). People from different work groups may have different views, use different languages and vocabularies, act upon different objects and in different environments, follow different norms and rules, and employ different methods and ways of doing things, which are situated in their practice. In other words, “knowledge and knowing cannot be separated from individuals’ engagement in the ‘practicing’ of their practice” (Carlile, 2002: 445). Thus, people develop situated understandings of objects and work processes, which may give rise to misunderstandings and communication problems in collaboration among people from different communities. Hence, studying work and collaboration between different functional groups and occupational communities implicates the studying of knowledge boundaries among these communities (Bechky, 2003; Carlile, 2002). Carlile (2002) conceptualizes knowledge boundaries as the boundaries that discern specialized knowledge within different functions, which might enhance innovation and problem solving within a function while inhibiting problem solving across functions. He suggests that collaboration can be problematic across pragmatic boundaries, as these entail not only the difficulty in communication, but also the consequentiality of interactions across practices, as they affect the interests of the actors on both sides of the boundary. Knowledge transformation is necessary to overcome difficulties in collaboration across pragmatic boundaries: individuals need to alter their current knowledge and create new knowledge, which they negotiate within each function and collectively across functions (Carlile, 2002, 2004).
Research has been evolving on how boundaries influence work in organizations, as well as how work is done across such boundaries. Carlile’s (2002) ethnographic study in a manufacturing company accentuated the need for knowledge transformation across boundaries, so that members of different communities alter their local understandings to create common understanding. His research highlighted the importance of boundary objects that may enable knowledge transformation across boundaries, as they are shared and shareable across functions. With the same notions in mind, Bechky’s study in an equipment manufacturing company (2003) acknowledged the role of the machine that was being produced, as a boundary object that engineers, technicians and assemblers used to co-create common ground across their boundaries and to develop shared understanding. Such perspectives suggest the need for sharing "deep knowledge" among members of different teams (Majchrzak, More, & Faraj, 2012) in order to understand the differences and dependencies between the different kinds of knowledge situated in each group’s practices. In this context, Tsoukas (2009) suggests productive dialogue as a way of externalizing assumptions about each other’s knowledge and dependencies between the different areas of expertise, implicit mental models and constraints, and different priorities (Carlile, 2004; Majchrzak et al., 2012).

However, Kellogg, Orlikowski and Yates (2006) pinpoint that such understandings of boundaries and boundary spanning may not apply to every situation, such as in knowledge intensive service organizations (where the impact of boundary objects might not be that visible), or across loosely coupled and heterogeneous communities. Their research on an interactive marketing organization brought light on how coordination was accomplished across boundaries in knowledge intensive environments with heterarchic organizational forms under fast-paced conditions. Their findings highlighted the role of technological artifacts in coordinating work across boundaries, but did not elaborate on how common understanding emerged among members of different communities.

As much as valuable research has been done around the process of knowing, research still needs to be developed around the process of working with knowledge. More specifically, research on working with knowledge across boundaries so far has focused mostly on the integration of knowledge (Bechky, 2003; Majchrzak et al., 2012). Still, few researchers (Levina & Vaast, 2005) have looked at what happens when members of a community are expected to employ in their practice knowledge of another community. For example, Brown and Duguid (1991) reflect on Julian Orr’s (1996) ethnographic study of service technicians and the fact that the technicians did not use the manuals developed by the designers (canonical practice) but instead followed their own improvised strategies (noncanonical practice); nevertheless the interactions across boundaries between these different groups are not discussed.

Finally, we suggest that further research is needed to understand how knowledge transformation takes place on the pragmatic boundary. Although Carlile (2002, 2004)
offers us valuable insights on how people may establish common interests for making trade-offs and establishing domain-specific knowledge, we need to further understand the process of knowledge transformation when differences among people are on a more fundamental level, such as on the epistemological level.

### 2.2.2 Studying epistemologies in practice and their clash across boundaries

In order to extend our understanding of knowledge boundaries and to address the challenges mentioned in the previous section, we draw our attention to the study of epistemologies and how they may be formed in practice. Epistemology is the field of philosophy dealing with questions such as “what knowledge is, how it can be obtained, and how knowledge claims can be justified” (Tsoukas, 2005).

A sub-field of epistemology, named social epistemology, is concerned with the social dimensions of knowledge and the interpersonal aspects of knowing (Miller & Lin, 2010; Schmitt, 1999). For example, some of the students of social epistemology conceive of knowledge as the set of beliefs that are institutionalized in a community, culture, or context. Social epistemology has influenced organizational scholars in the development of organizational epistemology (Krogh & Roos, 1995; Tsoukas & Knudsen, 2005), which is concerned with what organizational knowledge is, what forms it takes, how it emerges and how it evolves through social processes (Miller & Lin, 2010). However, such an organizational epistemology constitutes the organizational scholars' understanding of knowledge in organizations, and not that of organizational members themselves.

Work done on Science and Technology Studies, and specifically Knorr-Cetina's (1999) research, has helped us understand more about how epistemic communities work. Epistemic cultures constitute “those amalgams of arrangements and mechanisms -bonded through affinity, necessity and historical coincidence- which, in a given field, make up how we know what we know” (Knorr-Cetina, 1999: 1). Different scientific practices entail disparate epistemic cultures, so that the knowledge produced by one scientific community will not flow uninhibitedly to the other (Brown & Duguid, 2001). This also holds outside the scientific context. For example, Scott and Perry (2012) observe that different professional epistemic cultures entail different perceptions of what risk is. Wagner and Newell (2004) argue that the existence of multiple epistemic cultures in the university context entails the existence of multiple practices, which problematizes the embracement of one 'best practice' ERP implementation. Although in theory such approaches seem to imply the existence of different understandings about knowledge amongst different communities, they do not go further into explicating whether and how members of one community may shape their own distinct epistemology in their practice.

Few organizational scholars have explicitly addressed how organizational members form their own epistemologies. Miller and Lin (2010) approach epistemologies as individual beliefs about knowledge, and study how the existence of different
epistemologies and their combination in an organization affect interpersonal learning. However, it is not clear how these epistemologies are formed in an organization in the first place. Pentland (1995) refers to different epistemic criteria used by distinct occupational communities in an organization to debate on each other's knowledge claims, and he describes how a new information system may change the epistemic criteria used in knowledge construction processes in an organization. Even though this work interestingly reflects upon the idea of criteria for evaluating new knowledge, it does not go deeply into explaining how the members of the community developed and changed these criteria.

We argue that our understanding of negotiating knowledge between different functional groups of organizations will be enhanced, if we further explicate how such groups possess distinct epistemologies, i.e. their reflective theories about what knowledge matters and how this knowledge is generated. Drawing upon the domain of folk epistemology – a branch of social epistemology which deals with how people develop interpretations and intuitions to think and reason about knowledge (Goldman, 2007) – we suggest that knowledge workers, despite their non-scientific background, get to develop their own abstract notions of epistemology. Moreover, we suggest that such notions are situated in the practices that people perform. As Thompson (2005) indicates, communities of practice (Wenger, 1998) afford the development of epistemic characteristics related to how their members think, experience and learn as they participate in social activity. We argue that by engaging in the same practice, people get to develop not only situated understandings around the subjects, objects and activities involved in that practice, but also their self-understandings about how they do their work, a situated view of what knowledge is inside their practice. For example, the epistemology of lawyers views knowledge as "highly interpretable and contested", whereas the creation of knowledge is "grounded within and relies [...] upon an explicit knowledge base articulated in text-based forms" (Robertson et al., 2003: 853).

The epistemology of knowledge workers may be approached as a reflexive theory of knowing. Giddens (1984) argues that individuals constantly reflect on the reasons for and intentions in their everyday conduct, on the levels of both discursive and practical consciousness. According to Giddens (1984), reflexive monitoring is central to the social reproduction. In his book "The reflexive practitioner", Schön (1983) also elaborates on reflexivity, as the capacity of practitioners to reflect on what they are doing, even while doing it; e.g. an architect engaging in a reflective conversation while designing an architectural drawing, or a manager criticizing the results of his actions, or scientists in the lab testing their scientific theory. As such, individuals and especially knowledge workers (Jones, 2003) are often reflexive, by questioning how their knowledge is generated (D'Cruz, Gillingham, & Melendez, 2007).

Following this line of reasoning, we argue that the existence of different epistemologies in a knowledge intensive organization may offer a different manifestation
of conflicting interests and may influence the process of transforming knowledge (Carlile, 2004) between people from different groups, because fundamentally they may perceive knowledge differently. Furthermore, in an organizational setting with high interdependency between different occupational communities, in which the performance of members of one community is dependent upon the performance of members of another work group, organizational members of each occupational community may develop perceptions and expectations about how work is done and/or how it should be done by the members of another community, which may cause tensions in their collaboration.

In our qualitative study, we aim to investigate how practices may entail a distinct epistemology, as well as explain what happens when people from different occupational communities, with distinct epistemologies, come to collaborate together.

2.3 The case of analytics

Before presenting our qualitative study, we look into the case of analytics and explain why it may offer ground for studying differences in epistemologies among organizational members. With the term business analytics we refer to the set of practices, skills, techniques and technologies, such as statistical analysis and predictive modeling, which are employed by organizations to steer decisions and actions (Bose, 2009; Davenport & Harris, 2007). A common example of using analytics is the employment of market basket analysis (Kumar & Rao, 2006) by Walmart, with the goal to understand the purchase behavior of customers and to improve their sales promotions, store design, and so forth.

Business analytics brings a number of new challenges in the spotlight, which require us to view organizations differently, and will inevitably stay around even if the fashion of business analytics fades away. First of all, due to the tremendous rise of computing power and the availability of open source software solutions (e.g. R, Weka and RapidMiner), analytical techniques like predictive modeling and optimization are now easily accessible to organizations. Also, the rapid development of web, mobile and network technologies in the past two decades has fostered the continuous and fast-paced growth of data that organizations need to process. The technology has even necessitated a new role in the organization, the “data scientist” (Davenport & Patil, 2012), who has highly analytical skills and is capable of extracting the correct datasets and applying the appropriate techniques with the goal to find patterns in the data. Still, Emblemsvåg (2005) maintains that successful business analytics requires a combination of analytical with non-analytical work, which may be accomplished through a “portfolio of skills” (Bose, 2009) including data management, technology, statistical modeling and analytical, business knowledge, and communication/partnering skills. This blending of people from different backgrounds
may lead organizations to get lost in translation in their efforts to transform the analytics insights into decisions and actions. Such technical, managerial and communication issues related to business analytics pose several questions for IS scholars to answer. Nevertheless, currently most research on analytics is centered on data and technology aspects of analytics (Chen et al., 2012), while until now we have had little understanding of how organizations really use it. They are adopting it as if it is the holy grail of perfect information (Davenport & Harris, 2007), following the lure to become perfectly rational (Cabantous & Gond, 2011), but we still don’t know how this use of analytical tools and strategies may affect the way they make decisions and learn.

By definition, the rationale of developing analytics solutions is mainly to support organizations in making decisions, promoting data-driven decision making as the standard way in which organizations should drive their actions and make decisions (Brynjolfsson et al., 2011; Davenport & Harris, 2007; McAfee & Brynjolfsson, 2012). This rationale seems to promote an algorithmic way of working, by processing information and making inferences, similar to the practices of financial analysts that Knorr-Cetina and Bruegger (2001) describe. Even if such a way of working is often taught in business schools (Cabantous & Gond, 2011), it seems to be quite close to how a data scientist might think (Davenport & Patil, 2012), but not so close to how managers may work in practice (Cabantous & Gond, 2011). We suggest that an explanation for that might be found if we look at the epistemologies of data analysts and business users who are asked to use the analytics insights in their work. Thus, we suggest that the phenomenon of analytics implementation in an organization may offer us a good ground to study how people develop their own epistemologies in practice, and what happens when these epistemologies clash, when people have to collaborate across boundaries.

2.4  Research methodology

In order to answer our research question and elaborate theory (Locke, 2001; Vaughan, 1992) on knowledge collaboration across epistemic and epistemological boundaries, we take a process research approach (Langley, 1999) and perform an inductive longitudinal study in an organization that recently adopted analytics to support its marketing and sales processes. Given that most applications of business analytics are in larger organizations, often in marketing and sales, this constitutes a typical case of the phenomenon of interest (Gerring, 2007). Furthermore, our initial contacts with the respondents of the organization, who described the tensions that were taking place with the introduction of analytics, indicated that the phenomenon of interest would be “transparently observable” (Pettigrew, 1990: 275). The duration of the study was 24 months, from March 2013 to February 2015.
2.4.1 Research setting

TelCo is a telecommunications organization that serves both end-consumers and businesses, by offering them fixed line telephony and Internet, mobile telephony and data, and other services. Our study has taken place in the Business Market division, and specifically in the Marketing and Sales department. The business customers that are targeted are divided into four groups: corporate customers, large customers, medium customers and the mass market. Our initial focus was on Sales Medium, i.e. the part of the sales process that targeted medium-sized customers, who were coupled to specific account managers. This structure included ten sales teams clustered geographically into three regions. Each sales team was managed by the sales manager and consisted of ten account managers. Account managers worked in pairs of external (visiting customers) and internal (calling on the phone) and were assigned to a fixed set of 250-300 customers.

Customers were linked to an account manager when they did business with TelCo in at least one of the offered portfolios and created substantial revenues. The scope of Sales Medium was to maintain and expand the business done with these customers, and thus worked towards three objectives: renewal of existing contracts; deep-sell (selling more expensive features, add-ons etc. in the existing portfolio); and cross-sell (selling more portfolios). The sales process followed the purchase funnel model, a marketing model focused on the customer, which illustrated the theoretical trajectory of the customer: suspect (customer is assumed to be a possible client for a product); lead (expresses interest in the product and wants to receive an offer); prospect (finds the offer interesting, has sufficient budget and is interested in continuing); hot prospect (the main terms of the contract are sent and details are being arranged); and finally client (the contract is finally signed). The mission of Sales Medium was to transform customers from suspects to leads for all the portfolios offered. Thus, an account manager was responsible for getting the customer to agree to have an offer. After that stage, a partner organization of TelCo arranged the negotiation of the deal with the customer.

The CLM model. In 2012 the Marketing and Sales department started following the principles of Customer Lifecycle Management (CLM), which entails the measurement of business metrics related to customers to indicate the performance of the organization. In this context, customer lifecycle management in Sales Medium was coordinated by a campaign manager from the Marketing department, who arranged the implementation of different campaigns. Such campaigns were planned by five marketing managers who developed the campaigns for medium, large and corporate customers.

Analytics was introduced in the Sales department in January 2012, along with the introduction of the Customer Lifecycle Management (CLM)–way of working. The analysts ran different prediction models, using regression and classification tree techniques in order to predict the customers’ overall potential as well as their potential in retention,
acquisition and growth for each portfolio of TelCo: internet, mobile voice, mobile data, fixed voice, etc. Since the end of 2011, they had been generating the CLM model, which was assumed to help “contact the right customer at the right time and with the right offer”.

The CLM model provided a list of all medium-sized customers with several statistics, metrics, and forecasts about each customer’s potential to buy a service at a specific time. The model was developed by two analysts, who were members of the Customer Intelligence department. The account managers were strongly advised by the analysts and the campaign manager to use the CLM model in their work, in order to plan which customers to contact, when, and about which portfolios.

The CLM model was ran on a quarterly basis in order to generate new insights. Every quarter the CLM model also included other predictions, depending on the campaigns that were running, which indicated the potential of the customer for the specific campaign. The output of this model was represented in a spreadsheet format, which contained a list of all medium customers and the different predictions.

The standard analytic features included in the model were the customer segments and the CLM phases. The left side of Figure 1 shows a visualization of the customer segments. The analysts calculated the potential increase in yearly revenues for every customer, and, combined with the current yearly revenues, defined four customer segments: A (high revenues and high potential), B (high revenues but low potential), C (low revenues but high potential), and D (low revenues, low potential). As can be seen in the figure, the analysts suggested that the customer’s segment indicated what action the account manager should take for that customer.

Figure 2.1 The analytical components of the CLM model: Customer Segment (left) and CLM Phase (right) (Adapted from a TelCo PowerPoint presentation)

The CLM phases represent in what phase of the lifecycle the customer is, with regard to each portfolio. The CLM phase is calculated based on the revenues that the customer
brings in the specific portfolio and the potential increased revenue that the customer may make in that portfolio, which is calculated from the prediction models. As can be seen on the right side of figure 1, the account managers suggested that the CLM phase indicated what action the account manager should take for the customer for each portfolio. Other analytic components included in the CLM model included predictions on whether the customer may be interested in tablets, whether there is the risk that a customer may leave TelCo and go to a competitor for a specific portfolio, whether a customer may be interested in a running campaign, and so on.

2.4.2 Data collection

Data collection period 1: March 2013 - January 2014. We initiated our study in TelCo in March 2013 and focused on Sales Medium from the start. As our interest was to study the introduction of analytics, we had approached the head of Customer Intelligence to learn more about their analytics activities. He had informed us about the CLM model and the resistance that the analysts had been experiencing since its introduction in Sales Medium (January 2012). This triggered our attention and motivated our choice to focus on that phenomenon.

We started collecting data in March 2013, focusing on understanding the practices of the account managers and the analysts, their views on the CLM model, as well as how they collaborated with each other. We also tried to get as much information as possible retrospectively about the events that took place and led to the introduction of the CLM model, as well as how the tensions emerged in the first fourteen months of its introduction in Sales Medium (i.e. from January 2012 until February 2013).

Data collection period 2: February 2014 - April 2014. During our study, we experienced an interesting and unexpected turn of events. In February 2014, the higher management of TelCo announced a large re-organization due to the need to increase efficiency and reduce costs, which would result in firing all internal account managers in May 2014. At the same time, the CLM model gained a lot of importance as it appeared to be aligned with the actions towards increasing efficiency, and the analysts started making plans for expanding it to other sales channels. During that turbulent period for the account managers, we performed interviews with them, to understand how they made sense of the changes in TelCo. At the same time, we continued studying the analysts in order to understand their views of the changes and their plans regarding the CLM model.

Data collection period 3: May 2014 - February 2015. While on 1st May the internal account manager’s function ceased to exist in TelCo, the CLM model expanded to more sales channels. We continued collecting data during that period for various reasons. First of all, we were interested in studying how the CLM model would be established in the new sales channels. Second, the external account managers continued working for TelCo in a similar function as before, and still had to work with the CLM model. Also, some of the
internal as well as certain external account managers had been hired in other sales channels that also started receiving the CLM model, so we wanted to study how they would use the model in their new functions. Finally, we also tried to interview account managers who left TelCo, in order to get their reflections on the events.

**Interviews.** Semi-structured interviews (Weiss, 1995) constituted our main source of evidence. The interviews were conducted by the first author, who would e-mail the other co-authors after each interview to share her impressions with them. They would meet every two weeks to discuss the insights, look for emerging themes, and discuss where to focus on the next interviews. Thus, the interview guide was evolving through time.

In the first period of data collection, we started by asking people very broad questions to understand their practices and their views of the CLM model. We asked participants to bring their laptop, or to spend some time next to their desktop, in order for them to show us in detail how they made plans and prepared for their contact with their customers.

The interviews with the analysts would focus on their work in general, details about the CLM model and how it was generated, their opinion about the usefulness of the CLM model, and their encounters with the account managers. Similarly, the account managers had to describe a typical day at work, explain how they managed their customers, how they looked for sales opportunities, etc. In the first months we avoided asking the account managers about the CLM model explicitly, so that we would not bias their responses. However, the CLM model would always come up from them during the interviews, triggering the interviewer to ask follow-up questions on how they used it, how they perceived its use, how they interacted with the analysts, and so forth. All respondents were also asked questions to describe the events (and perceptions of those events) during the first year that the model was introduced.

In the second period of data collection, the interviews with the analysts would focus on the developments of the CLM model and their plans on expanding the CLM model to more sales channels. Our goal was not only to capture the events, but also to better understand the views of the analysts on the CLM model, and through that understand whether and how their views on knowledge had been evolving. The interviews with the account managers in that period were around the reorganization and how that was influencing their work. As the reorganization constituted a major breakdown for the practice of the account managers, it offered us the opportunity to better understand the dynamics of their practice, their views of the way TelCo was organized, and other interesting aspects that came to the surface. We also focused on their perception of the CLM model and whether they saw any relation with the changes that were taking place.

In the third period of data collection, we continued interviewing the analysts on how the expansion of the CLM model was developing. We were eager to understand how their experiences from introducing the CLM model to the Sales Medium were influencing the way they introduced it to other sales channels. Next to that, we interviewed the external
account managers, whose function was now somewhat different. Furthermore, we interviewed various people from other sales channels (Hunting Team, Sales Large, call center), who had started receiving the CLM model. Some of those people were former account managers from the Sales Medium who had taken up new roles in those channels. We aimed to understand how they worked, as well as how they perceived and used the CLM model.

Overall, we performed 78 semi-structured interviews, lasting about 56min on average.

Observations. Interviews were complemented by ethnographic observations, conducted by the first author as a passive participant (Spradley, 1980).

The first author observed account managers by shadowing them, in order to understand how they worked, how they used the CLM model, etc. She would sit next to an account manager for the whole day, in order to see how they planned which customers to call, how they contacted their customers, and so forth. She kept detailed notes about the actions of the account managers and the type of systems and information they were using and how. She participated in the lunch breaks in order to engage in informal discussions with them.

Similarly, the first author also shadowed analysts, and specifically those involved in the construction of the CLM model. She would observe how they worked while preparing queries and analyses for the CLM model, meeting with other stakeholders to discuss the development of models, and so on. Shadowing was often followed by an interview with the participant, in order to verify the observations and to gain more insight from the informant’s subjective perspective.

It is interesting to highlight the different ways in which analysts and account managers were interacting with the observer: The account managers were always very talkative, and would often turn to the researcher and explain to her what they had been doing on their computer, what they had been discussing with a contact person on the phone, and so forth. The analysts were hardly ever talkative, except during the lunch breaks. In order to better understand how they were working, the researcher used her prior experience as an analyst herself in order to comment on the queries they were developing, etc. These comments would then probe them to reflect on their work. While explaining the code that they were developing, they would also explicate their views on the CLM model, how they expected it to be used by the account managers, as well as their views on what kind of information and knowledge mattered to them.

Another type of observation included observing meetings. In particular, we observed two types of meetings: Kick-off presentations were running on a quarterly basis. In these presentations the campaign manager and the analysts presented the new version of the CLM model, and a marketing manager presented new campaigns that were running in that quarter. We also observed some of the weekly meetings of the Customer Intelligence team,
in which the analysts would discuss updates on their analytics projects and their plans for future projects.

**Documents.** Finally, documents were used in order to triangulate information from the interviews, and in particular to verify retrospective information. We used public documents (such as press releases and annual reports of TelCo), news items, PowerPoint presentations (mainly from the kick-offs), and Excel sheets that included the variables (and descriptions of those variables) included in the CLM model.

An overview of all collected data is provided in table 2.1.

<table>
<thead>
<tr>
<th>Data collection period</th>
<th>Type of data</th>
<th>Type of informants</th>
<th>Number</th>
<th>Total time</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Period 1</strong> (March 2013-January 2014)</td>
<td>Interviews</td>
<td>Account managers from Sales Medium</td>
<td>18 interviews</td>
<td>15.6 hours</td>
</tr>
<tr>
<td></td>
<td>Observations (shadowing)</td>
<td>Account managers from Sales Medium</td>
<td>3 days of observations (shadowing), 28 single-spaced pages of notes</td>
<td>24.5 hours</td>
</tr>
<tr>
<td></td>
<td>Interviews</td>
<td>Analysts</td>
<td>6 interviews</td>
<td>5.75 hours</td>
</tr>
<tr>
<td></td>
<td>Observations (shadowing)</td>
<td>Analysts</td>
<td>1 day of observations (shadowing), 9 single-spaced pages of notes</td>
<td>9 hours</td>
</tr>
<tr>
<td></td>
<td>Interviews</td>
<td>Sales managers from Sales Medium</td>
<td>4 interviews</td>
<td>4.1 hours</td>
</tr>
<tr>
<td></td>
<td>Observations of meetings</td>
<td>Kick-off presentations of analysts and campaign manager to account managers and sales managers</td>
<td>3 meetings observed, 24 single-spaced pages of notes</td>
<td>3.15 hours</td>
</tr>
<tr>
<td></td>
<td>Interviews</td>
<td>Campaign manager</td>
<td>1 interview</td>
<td>1 hour</td>
</tr>
<tr>
<td></td>
<td>Interviews</td>
<td>Marketer</td>
<td>1 interview</td>
<td>0.8 hour</td>
</tr>
<tr>
<td><strong>Period 2</strong> (February 2014-April 2014)</td>
<td>Interviews</td>
<td>Account managers from Sales Medium</td>
<td>4 interviews</td>
<td>4.25 hours</td>
</tr>
<tr>
<td></td>
<td>Interviews</td>
<td>Analysts</td>
<td>2 interviews</td>
<td>1.5 hours</td>
</tr>
<tr>
<td></td>
<td>Observations (shadowing)</td>
<td>Analysts</td>
<td>5 days of observations (shadowing), 43 single-spaced pages of notes</td>
<td>32 hours</td>
</tr>
<tr>
<td></td>
<td>Observations of meetings</td>
<td>Weekly meetings of the analysts’ team</td>
<td>6 meetings observed, 9 single-spaced pages of notes</td>
<td>5.5 hours</td>
</tr>
<tr>
<td></td>
<td>Interviews</td>
<td>Sales managers from Sales Medium</td>
<td>1 interview</td>
<td>1.1 hour</td>
</tr>
<tr>
<td></td>
<td>Interviews</td>
<td>Campaign manager</td>
<td>1 interview</td>
<td>1 hour</td>
</tr>
<tr>
<td><strong>Period 3</strong> (May 2014-February 2015)</td>
<td>Interviews</td>
<td>External account managers from Sales Medium</td>
<td>8 interviews</td>
<td>8.5 hours</td>
</tr>
<tr>
<td></td>
<td>Interviews</td>
<td>Former account managers from Sales Medium</td>
<td>3 interviews</td>
<td>2.25 hours</td>
</tr>
<tr>
<td></td>
<td>Interviews</td>
<td>Account managers from Sales Large</td>
<td>11 interviews</td>
<td>10.75 hours</td>
</tr>
<tr>
<td></td>
<td>Interviews</td>
<td>Account managers from Hunting team</td>
<td>5 interviews</td>
<td>5.5 hours</td>
</tr>
<tr>
<td></td>
<td>Interviews</td>
<td>Call center Agent</td>
<td>1 interview</td>
<td>0.5 hour</td>
</tr>
<tr>
<td></td>
<td>Interviews</td>
<td>Analysts</td>
<td>9 interviews</td>
<td>7.25 hours</td>
</tr>
<tr>
<td></td>
<td>Observations (shadowing)</td>
<td>Analysts</td>
<td>2 days of observations (shadowing), 6 single-spaced pages of notes</td>
<td>10 hours</td>
</tr>
<tr>
<td></td>
<td>Observations of meetings</td>
<td>Weekly meetings of the analysts’ team</td>
<td>1 meeting observed, 1 single-spaced page of notes</td>
<td>1 hour</td>
</tr>
</tbody>
</table>
## Data analysis

The initial goal of our study was to understand what happens when analytics is introduced in organizations. We followed a practice-based perspective (Feldman & Orlikowski, 2011; Nicolini, 2012) in order to analyze the practices of the different communities in TelCo (and specifically of the analysts and account managers) and to understand how they interacted with the CLM model in their practices (Orlikowski, 2000).

Due to the longitudinal nature of our data, we chose to follow a process research approach (Langley, 1999) in order to track the flow of events and to understand why things unfolded in that way. The complexity of the data and the variability of their temporal embeddedness led us to employ a multitude of strategies for making sense of process data, namely a narrative strategy, a temporal bracketing strategy and a grounded theory strategy. We created an event list (Poole, Van De Ven, Dooley, & Holmes, 2000) to maintain our chain of evidence, identify patterns, and to use it as a scaffold while alternating among the different sensemaking strategies and literature.

**Inductive coding and Event list.** We started open coding in parallel with our data collection. Initially, we focused on aspects related to how the analysts and account managers worked, in order to understand their practices. We focused on actions that they performed in their everyday activities: For the account managers, we were particularly interested in how they planned the communication with their customers, how they tried to sustain the relationship with them and why that was important, how they prepared themselves before contacting the customers, and so forth. We also coded for the digital technologies that they used in their actions and their perceptions of them, including the CLM model. Furthermore, we coded for events related to the introduction of the CLM model in their work, as well as their perceptions of those events and their reactions. As far as the analysts were concerned, we coded for the activities that they performed in their
work, which were related to the construction of analytics artifacts, as well as to the communication strategies they used with their “internal customers” (and particularly the account managers). We also coded for events related to the CLM model, how they interacted with the account managers about it, and how they tried to motivate them to start using it.

From the open codes that we had coded, we selected all codes that represented events (decisions, outcomes, meetings, actions, practices, behavior and background trends) that were directly or indirectly related to the introduction of the CLM model in Sales Medium and how this unfolded. We then created an event list that included the time sequence of events. The temporal complexity of those events complicated this stage: whereas certain types of events such as facts, decisions, and meetings could be clearly appointed in time, other events would recur throughout timespans. Some of those events such as certain activities and types of behavior recurred only for a determined time span that could later on be appointed to a specific “period” (Langley, 1999: 703), while others, such as practices as well as beliefs and opinions, were recurrent throughout the whole timespan of study.

**Case narrative.** The case narrative is a useful strategy to enrich our understanding of the phenomenon, as it includes contextual details that capture the richness and complexity of the setting (Langley, 1999). With the help of the event list, we constructed a detailed story from the raw data, which helped us construct the chronology of events, identify linkages and patterns between different types of events, and establish analytical themes (Pettigrew, 1990: 280). The narrative voiced the different perspectives of the analysts, account managers, sales managers, and the campaign manager, by drawing on their quotes from interview transcripts and the author’s observations captured in the field notes.

**Thematic coding.** Themes were already emerging after the first few months of our data collection, when we had started noticing that both analysts and account managers would emphasize their views on knowledge, such as what kind of knowledge matters, or how knowledge that matters is generated. Our second-order coding (Corbin & Strauss, 1990) was being reconfigured throughout the duration of our study, while iterating between interview transcripts, observations, our events list, and literature. Our analysis showed that the knowing practices and the epistemologies of analysts and account managers did not substantially change through time. Therefore, first we conceptualized them based on the way we encountered them at start, organizing the relevant first-order codes and second-order themes in tables (included in section 2.5). Other concepts were more dynamic and helped us make sense of the process of how the clash of the two epistemologies emerged. Those were organized in five themes that indicate the phases through which the epistemological clash emerged: the introduction of analytics in Sales Medium; the explication of the different epistemologies and tensions that emerged; the
Chapter 2. Epistemologies in Clash

attempts to traverse epistemic boundaries; the attempts to appropriate each other’s epistemology; and finally the prevalence of one epistemology.

In section 2.5 we describe the practices of the analysts and the account managers in TelCo. We highlight their knowing practices and illustrate the epistemologies that they had formed within those knowing practices. This description is based on the way we initially encountered them. The descriptive first-order narrative is provided in section 2.6. In section 2.7 we continue with a second-order analysis and construct a process model of how a clash of epistemologies unfolds.

2.5 Knowing practices and epistemologies in TelCo

2.5.1 The practice of the account manager: Sustaining the customer relation to create leads

In this section we describe the practice of the account manager, and illustrate the knowing practices through which account managers generate knowledge. The account manager’s role in the process of Sales Medium is to create leads, which indicate that customers want to receive an offer from TelCo, for retention, growth or acquisition of a specific portfolio or campaign. Account managers are evaluated based on the number of leads that they submit in CRM and on the revenues that come from the closed deals. In order to get their yearly bonus they have to reach specific targets, which are set based on the revenues that are created by the orders of their customers.

Account managers work in duos of an internal and an external account manager. Together, they have the same set of customers and the same targets. They internally arrange which customers need to be contacted most often, and which customers need to be visited. This highly depends on which customers they find important, judging by actual and potential revenues.

Internal account managers work every day from the office. They communicate with the customers on the telephone in order to find opportunities to create leads. They are required to make 60 calls per week and have to communicate with each customer at least once a quarter. Every morning, internal account managers check: the funnel in the CRM system to find stored opportunities; database systems that show contracts that are about to expire; notifications in the outlook calendar; and e-mails that require taking action. Then, they plan accordingly to call some customers. They try to make the preparation before calling the customer as minimal as possible, so they only take a quick look at the different systems to find information about news, contracts, revenues from the customer, etc. The account managers call the customers and and speak to them about their business, and during the conversation they try to find opportunities to talk about TelCo’s portfolios. After every call, the account managers store the information they have got in the
interactions component of the CRM system and they also add any selling opportunities and register any created leads in the funnel.

The external account managers mostly work on the road, visiting customers in their offices. They are required to visit eight customers per week, so they usually do two visits per day for Monday-Thursday and work at the office on Fridays, to plan the work for next week, participate in team meetings, and so forth. While they are in the car, they talk to their internal account manager on the phone to update each other. The external account managers prepare for their meetings in the morning, before leaving for the first appointment. They mostly check their notes from past appointments and information on interactions submitted in the CRM system. They may also search in various databases for information about the customer’s contracts and revenues.

In order to ensure maintaining the revenues that are already coming in, the account managers work hard towards retaining the customers. Therefore, frequently the calls are about renewing contracts that are about to expire. The account managers check several databases that include the expiry dates of contracts on each portfolio, and they make sure that they talk to the customers whose contracts are about to expire, about one or even two months ahead. Then, they try to get the customer interested in renewing the contract, but also they try to find opportunities to talk about other portfolios for cross-sell.

"From here [database on mobile contracts], I can see which mobile contracts are running out of contract. [...] We call [this system] the clothing hanger, from which we call the customer. So I call him and say 'Hey, listen, I see your mobile phone is getting out of contract, what are your plans?' And then I make the deep dive [...]: 'And I would also like to talk to you about your fixed internet connections, I see you don’t have them at TelCo, I see you're open or I think you’re missing something, can we talk to you about it?"

(Internal account manager)

Information sources are important for supporting the work of account managers. Information systems, databases and other sources of information are constantly open on the computer screen of every account manager, in order to help plan when to contact a customer and what to talk about. All account managers have developed their own heuristics on how to search for information. A common heuristic includes ranking expiry dates of contracts, as previously mentioned. Also all account managers search in the CRM system for selling opportunities that they had stored during previous contacts with their customers, in order to find opportunities that are coming up, and call these customers to talk about them.

"So I'll read what happened and I'll call the customer and at the same time I'll look at the funnel. And I see here – so this is what’s in the funnel... [He is showing on his laptop screen] So I see what is the status, what is happening right now. As you can see we have many open leads here. [...] I'll look at the end date, and I see ok. I see something’s happening on the first of December. And then I'll just know there’s an opportunity coming up, and I'll try to phone the customer and talk about the opportunity that is coming."

(Internal account manager)
Although there are so many tools with information available, inextricably intertwined with the account manager’s practice, the account managers rely more than anything else on their contact with the customer to understand what is happening in that company, to identify selling opportunities, and to drive their actions. Thus, the contact with the customer is the most important source of information, which will help the account managers find opportunities and guide them on whom to contact, when, and what they will talk about:

“No, I try to get the client to talk about his business. And when he’s talking about his business… Again, you have to make the link for yourself, to think with the client about his business, and then, after that, you can make the opportunities for TelCo. Because you know what his business is, what he wants, what is not going well and what is going well, so then you can talk with him: 'How can we make it better? How can we make your communication go better? So that you can make your work better and more efficient…’”

(External account manager)

The account managers store the information they get from their customers on personal notes, calendar, spreadsheets, and in the CRM system, in order to remember to talk to the customer when there is an opportunity:

“I always register everything in CRM. I make a funnel for example, if they say “Next year we are moving to another address.” I make a note for myself, and register everything, and then I call the client back, and ask them: “Are you still moving out? How many people are moving with you? Are you going to change the telephone central?” All those kind of questions… So I get the information from the client, and not necessary from lists or systems…”

(Internal account manager)

Since getting information from the customer is crucial for the account managers, they believe that it is important to sustain a good relationship with the customer. In this way they can serve the customer well, while they can always stay informed about what is happening in their business, and be alert for new sale opportunities.

“I’m in this job for the relation with my customer. And that means I like to have a relation with my customer that I can come with a cup of coffee, talk to him about his business, advise him about things to do, and in a month, four-five months, or maybe in a year, I can come back. And he thinks of me, he gives me a ring at the moment that something is coming up. The relation has to be so good, that the customer thinks of me when he wants to buy something.

(External account manager)

In order to sustain a good relationship with the customer, the account managers even try to build personal relations with the contact persons, as this helps build trust:

After she set the reminder to call this client in two weeks, she told me that she will ask him how the holidays went. She said that she asks everybody this. And she told me that there are clients with whom she speaks very friendly and they speak every other week, and she knows a lot about them, even to which school their kids are going. And they also know about her daughter etc. I asked if she writes all this personal information down about them, or whether she just remembers it. She said that she just remembers it, because she speaks often with these clients. She told me that usually, when she has a new client, she speaks very formally in the start, like “I’m your internal account manager and I will call you four times a year”. But while the
relationship develops, she gets to know them better, and then she knows more personal information. But at the same time, there are clients that she has had for 4 years, and she still speaks very formally with them.

(From field notes while shadowing an account manager)

Thus, the account managers' knowing practices include: getting information by contacting the customer, knowing context-specific information about the customer, estimating potential sales opportunities, codifying knowledge and using codified knowledge from the past, using the past experience of the account manager, and using information from information systems.

Table 2.2 Knowing practices of the account manager

<table>
<thead>
<tr>
<th>Knowing practice</th>
<th>First-order concepts</th>
<th>Exemplary Quotes</th>
</tr>
</thead>
</table>
| Getting information by contacting the customer | • Building trust with the customer to ensure getting the right information  
• Getting information by speaking with the customer  
• Getting to know personal information about the contact person  
• Letting the customer tell what he finds most important | “Because the client can tell best. [...] The client knows what he wants. So when you have a good relationship with your customer, they tell you what is going on in their organization. And that information is based on the truth, because they say what they want. So based on that information, you take actions at the right time.”  
“And that’s… yeah, you get to know, and you get to have the feeling with your customer, if you can trust the guy, if you can ask the right things and get the right information. If you don’t get the right information from the IT manager, for example, you can’t make a good offer…”  
“But sometimes organizations, clients, are growing fast and you don’t know that from the models… So I like it from outside in, with calls and clients…” |
| Knowing context-specific information about the customer | • Getting to know what the contact person is doing  
• Knowing how the business of the customer works to understand his needs  
• Using the information that they get from the customer | “Because I need to understand how our customer is working, to give him the best solutions. I can only give him a good solution when I know how he’s working, where he’s…. Well, I always ask ‘From which points you get headache?’ It’s headache points…. When you know where he gets headache from, then you can see yeah… From that point, we have a solution for it…”  
“I have to understand their business so I can give advice how TelCo can help them. I am just interested in their business, what they are doing and how it goes. I think that it is good for the relationship to understand your client; to know what is on his mind, e.g. is that costs or is that easiness. So you can focus your portfolio on that.” |
| Estimating potential sales opportunities | • Estimating the customer’s potential by talking to him  
• Finding opportunities by talking to the customer  
• Interpreting the potential of the customer based on their experience  
• Intuitively knowing what to tell/offer the customer | “It’s more like feeling… Kind of we know what kind of client it is, what they do, what they want, what we can provide, what we already do, and what we can get more…”  
“And we sales people, we’re thinking with our common sense, and we’re working with our guts. And the meaning is that we’re not waiting from an idea, or a way of thinking of marketing, but with our common sense, and always talking with the clients.” |
| Codifying knowledge and using codified knowledge from the past | • Finding information about the clients in the CRM system  
• Storing information and their interpretations of it in the CRM | “Important for me are my notes. And you put them in the interactions section. So if the customer calls me, or calls somebody else, they make a note of it. If I call my customer, I make a note. If my outside account manager...” |
| System or shadow administration, and later retrieving that to decide how to act • Storing sales opportunities and later retrieving them | Visits the customer, she gives me her notes, and I will put them in the interaction section. So if I look it up half year later, Oh I discussed this, and this, and this, and before I call the customer, I look at the interactions, see at what I discussed.”
“I always register everything in the CRM system. So I make a funnel for example if they say "Next year we are moving to another address." I make a note for myself, and register everything, and then I call the client back, and ask them, “Are you still moving out? How many people are moving with you? Are you going to change the telephone central?” All that kind of questions... So I get the information of the client, and not necessary of lists or systems...” |
|---|---|
| **Using the experience of the account manager** • Knowing which customers have potential • Remembering the information about the customer • Through their experience, they know what to offer the customer based on what he has | “If I have a customer I have seen once or twice or three times before, then it’s over here (shows his head).”
“And some account managers did it on their own way as well. They knew when a client had this and this and this, then it would be nice to call him about this.” |
| **Using information from information systems** • Verifying the information from the systems by contacting the customer • Verifying the information from the systems with their own notes • Interpreting the data from the databases • Checking the news to find information about the customer • Facts such as contract dates indicate when they should call the client to ensure retention • Using the information from the databases to extract more information in the conversation with the customer | “[We have] also a system to look if the client has ADSL, cable... those kind of products. And the revenue list... How much he did in the past 12 months, for example. So I can see which products he’s paying for, and then I know what he has or doesn’t have. Or I can see the first six months he had a lot of ISDN, and the last 6 months he has zero revenue. So then I can see that and think why? Did he go away? Or did he close some offices? What happened there? So that’s information too. Or his revenue is...”
“Not that much at the moment... [...] The reason is that I see too many differences, between those calculations. [...] [For example] they say it’s a small company, and then it turns out to be a very big company. So I can’t trust that. So that’s why I have to talk to the customer himself, to see if that’s true.”
“It’s strange because we have a lot of information, but we don’t know if the information is a hundred percent reality. So you always have to check at your customer. In the sixty percent you are right and in forty percent you are not right. So yeah, what do you do with the information if it’s not a hundred percent [accurate]? You are only scanning that, because you cannot be sure that it’s true what is standing in the CLM.” |

### 2.5.2 The epistemology of the account manager

During our study at TelCo we observed that the account managers would often reflect on their knowing practices and explicate what they considered to be real knowledge and what sources of knowledge they found valuable. This explication of their own reflexive theories of knowledge emerged during the interviews, unexpectedly for the researcher who was performing them. When the account managers were asked to explain why they did not use the CLM model, they would provide their explanations by referring to these reflexive theories of knowledge, i.e. their own epistemologies. These epistemologies were also mentioned indirectly by the analysts: when they described the resistance that they had
experienced from the account managers, they mentioned that the account managers had been arguing about what kind of knowledge mattered to them.

Thus, account managers often reflect on their knowledge, which is primarily concerned with knowing their customers and how to serve them in a way that will satisfy their needs and will yield high revenues. Their epistemology can be viewed in table 2.4, vis-à-vis the epistemology of the analyst.

Account managers conceptualize knowledge as the relational, context-specific knowing of their customers. More specifically, for the account managers it is important to understand how the business of the customers works, what challenges they are facing and what their plans for the future are, in order to identify their needs, which can then be translated into opportunities for sale:

“I try to get the client to talk about his business. And when he's talking about his business... Again, you have to make the link for yourself, to think with the client about his business, and then, after that, you can make the opportunities for TelCo. Because you know what his business is, what he wants, what is going well and what is not going well, so then you can talk with him 'How can we make it better? How can we make your communication go better? So that you can make your work better and more efficient...”

(External account manager)

Thus, the account managers believe that maintaining a good relationship with the customer is essential to get the necessary information and to estimate the potential for sales. In fact, the account managers consider the status of their relationship with customers as indicative of their knowledge of them:

“Because the client can tell best [...] The client knows what he wants. So when you have a good relationship with your customer, they tell you what is going on in their organization. And that information is based on the truth, because they say what they want. So based on that information, you take actions at the right time.”

(Internal account manager)

“The longer the relation is, the bigger is the trust, the bigger is your knowledge of the company and your knowledge of the processing, and the better you can advise.”

(External account manager)

Account managers reflect on the generation of their knowledge as an intuitive process, which involves interpreting the information they receive while talking to their customers. They often refer to this as “feeling” the customer's needs or “feeling” when there is potential for sale. Thus, speaking and listening to the customers is fundamental to understand their needs:

“Most times people say that account managers are people who talk a lot, but it's the opposite. Good account managers are people who listen, very carefully, and ask the good questions on the right way, and feel when a customer needs something, and back off when he doesn't want to... And that's a... yeah... It's just listening very well to what the customer is saying...”

(Internal account manager)
Account managers justify their knowledge claims either by referring to their contact with the clients, or by claiming their past experience. As they view whatever information comes from the clients as the truth, suggesting that they know something about a client because they talked to a contact person is often used in their justifications:

“The funnel is the truth. The CLM is a prediction based on… But the funnel is the truth spoken with the client. So it's another kind of truth. CLM could be true as well; some things in the CLM are true as well. Expiry dates are truth. So you know, when that expires, that is a suspect for me. I should call the client on that type of business. But when you put it in the funnel, it’s your truth, so you have to use that before all.”

(Sales manager)

“I can tell you from the top of my head, on all seven basic pillars that we sell, what kind of contract the customers have, with what company, if it’s with us, when the end date is. If it’s with another provider I kind of know the end date and otherwise I look it up because I keep it in my own model, and it’s a thousand times more accurate because I asked the customer, and I don’t get it from a database.”

(External account manager)

Referring to their own experience is also a way for justifying their knowledge statements. They claim to remember a lot of information about the clients with whom they have a good relation, while they use their past interactions with their customers as ways to justify that they know them:

“I don’t work that way… I make a funnel, and I have been using my client account, I have it for two and half years. So I know my clients, I know the opportunities; I know what is there and what is not there. So I’m not depending on that list.”

(Internal account manager)

“But because we already know with our own experience what they were, I use my own experience first, and then I let CLM lean next to it, if it matches.”

(External account manager)

### 2.5.3 The practice of the analyst: Modeling a fact-based world

In this section we describe the practice of being an analyst, and illustrate the knowing practices through which analysts generate knowledge. The Customer Intelligence team consists of analysts, who are responsible for analyzing customer data and offering the insights to Marketing and Sales. They use data from TelCo's databases as well as data that they buy from other organizations' databases, in order to make predictions about the churn/retention, growth and acquisition of portfolios by TelCo's business customers. Also, they often prepare a trend analysis of the market to support the organization’s strategy. The analysts’ educational background is usually on engineering and econometrics, while they have a lot of experience in quantitative data analysis inside TelCo and from prior work in other organizations. The analysts' job is to offer data insights to the internal customers of Customer Intelligence, i.e. marketers, campaign managers, product managers, account managers, and others. They often have meetings with them (or their managers) to identify their needs (e.g. what target groups a marketer is
searching for a new campaign), and then use their knowledge in analytic techniques to think of ways to produce information that is useful for them. The analysts do not have access to all databases of TelCo. Therefore, they are often concerned with finding ways to access more data that they can analyze, in order to produce more valuable insights. They also try to arrange paid access to external databases that could help them enrich their datasets.

Two members of the Customer Intelligence team are responsible for the development of analytics for Sales Medium, which are all packaged in the “CLM model” artifact. They produce new insights from the CLM model every quarter. They collaborate together with the campaign manager and a database marketer, with whom they consider to be a team in this project. The team meets once a week and they discuss their planning towards the next output of the model, features that are added to the model due to campaigns that are running at that time, and other extra information. The two analysts do not have a specific division of tasks between them, but instead they collaborate on an ad-hoc basis. Six weeks before the start of the next quarter, the analysts start working towards preparing the queries to create the new dataset. Three weeks before the next quarter starts, they actually run the queries and the algorithms to produce the analytic results. They then send these results to the database marketer, who adds extra information from databases that the analysts have no access to, such as data from the CRM system. The analysts have the vision to improve the way sales is done by offering their model:

“We really want to do every contact with the customer as good as possible. But also when we contact the customer, [we want to make sure] that we contact the correct customer, but also at the correct moment, and with the right offer.”

(Analyst)

Overall, the knowing practices of the analysts include identifying the needs of their internal clients, constructing the datasets for analysis, creating data models, validating the models, analyzing data by running data models, and presenting the insights of the analysis. A systematic illustration of those practices can be found in Table 2.3.

Table 2.3 Knowing practices of the analyst

<table>
<thead>
<tr>
<th>Knowing practice</th>
<th>First-order concepts</th>
<th>Exemplary Quotes</th>
</tr>
</thead>
</table>
| Constructing the dataset for analysis | • Data gathering  
• Making queries in the databases  
• Constructing the dataset  
• Thinking of which prediction model could be used to predict the customer’s potential for a specific campaign  
• Thinking of which variables can be included in the model | She opened an excel file as well as the SQL Server Management Studio. She started writing a new SQL query. The screen went black at some point and she panicked. But apparently there was some bad connection with the cable, so the screen went back on and nothing was lost. She said ‘I’ll save it right away’. Indeed, she saved the file instantaneously. (From field notes)  
“We are looking at the tables that are available, and what kind of information we want to put in, and if it is possible for me to match different kinds of information. So I’m working on that...” |
Creating data models

• Making models by analyzing the data of the customers who currently have a product
• Making the profile of customers who have a product
• Making the profile of customers who churn
• Thinking of which variables can be used to calculate the potential
• Thinking what can be done with the data that is available
• Updating the models
• Using different quantitative analysis techniques

“What we would do in developing the propensity model is look at the profile of the users at this moment, what types of industries, or other types of characteristics of clients have used or bought this product now. Say for example, we find that the service industry or the ICT industry is the main buyer of this product. Then we would look for lookalikes in the rest of the database and then we calculate some value for each individual client, up to what extent they answer to the profile of our current customers... And that is what the propensity model does.”

“We've got 7-8 prediction models that fit the model to predict the customer segment and then the phases. And then for each campaign, we decide if we can use a prediction model, or then we just use some criteria.”

Validating the models

• Validating the outcome of the prediction models

“But we build the model once, so if there is a value as a predictor for the minimum value of hundred euros profits it will stay in the model over time, until we decide to adjust the model itself, or build a new model. And every once in a while we test what the outcome of the model is predicting, if it’s valid, if the prediction is good, is realistic, and if not then we change the model itself.”

Analyzing data by running data models

• Running the models

“Yeah we run the models. Most of them every month or maybe every two months. What I do is that I collect all the results of all the different models, put them together and then after a calculation, some preparation, I get for each client, for each model, a value – as I just explained. And now it is more or less repeating sort of automatically running the 3D model.”

Presenting the insights of the analysis

• Presenting their insights
• Providing advice to Marketing and Sales on what they should do, based on their analysis insights
• Kick-off presentations: The analysts with the campaign manager present the CLM model to each team every quarter

“There was a calculation that the current way of working didn’t make any profit. There were too high expenses for too few accounts. So at the same time we discovered that the way of working with business partners was much more profitable, it was a more difficult way of working, because you didn’t have the control of the sales managers, but the costs were lower. We looked from our entire base of customers, which customers would be suitable for that new way of working, so in that way it was an advice from customer intelligence. ‘Stop with what you are doing. Do it this way. Target those customers.’”

2.5.4 The epistemology of the analyst

The analysts often explicated their reflections on what kind of knowledge matters and how this knowledge is generated, when we asked them during the interviews why they believed that the CLM model was important to the process of customer management. For the analysts, knowing is closely related with the analytics practice, which they view as a practice for knowledge production. They often reflect on knowing and the generation of knowledge when they reflect on the construction of their models, or the usefulness thereof. A detailed account of their epistemology can be found in table 2.4, vis-à-vis the epistemology of the account manager.

The analysts understand knowing from an algorithmic perspective. They believe that the insights of the quantitative analyses constitute knowledge about TelCo’s customers and how they should be approached. In other words, if a model shows X about customer Y, then Y needs to be approached with the Z campaign, and so forth:
2.5 Knowing practices and epistemologies in TelCo

“But I know what I put in there, I know the system, but if you are into the Marketing department, I’m not going to bother you with all the details... I would really like just to show you this, and say... well if you are in charge of broadband, then I have for you a good selection of 129,000 customers that you best, that we best can offer broadband.”

(Analyst)

“It’s not really knowing, because you never know for sure of course. It’s actually based on these prediction models, and it’s always a probability of course, so you’re never sure that someone is really going to churn, for instance. So what we do, is move all these probabilities, for instance, fixed voice, and then we link this probability... For instance when a customer has a high probability of leaving, there’s a certain amount of revenue, that is also, that will also leave when this customer leaves. So we calculate what is the potential that leaves, when this customer leaves. And you have, for instance, this potential for fixed voice, for Internet, and for mobile voice, etc. And then we order these potentials, and if the customer has the highest potential, for instance for Internet, then you can say ‘Well this customer, we should call first for internet because otherwise this customer will leave...’

(Analyst)

For the analysts, knowledge is obtained through data analysis. They select data from TelCo’s and other external databases, which, combined, are believed to indicate the behavior of the customers. This behavior can be modeled with segmentation techniques, which yield customer profiles. By analyzing the data with prediction models, they can also assign probabilities to future actions of the customers.

“Because you can know a lot about the customer, but I don’t think that the account manager also knows when the customer is interested in new products, or when he’s likely to churn... all this kind of information. That’s something you take from the dataset.”

(Analyst)

“Yeah, we advise her and she can tell "ok, my proposition is only for customers who had more than 5 mobile phones". So then we say "ok do you want to have the split with 5 mobile phones or with 5 employees?" Because K. [another analyst] and I know the data so we know what’s available, and we can advise her from that part... She knows more from the marketing view and from the proposition view what kind of profile we need... But we’ve got also the predictions models, and then you just take the result from the prediction model.”

(Analyst)

From the analysts’ perspective, knowledge claims are justified with facts. They believe that “hard” data that comes from the databases is more trustworthy information than the interpretation of the account manager, which could be falsified.

“Because this is really... these are facts. And from CRM it’s also input from the account manager. So it’s a different kind of data, because it’s just... human input (laughs). [I would trust more] the facts. [...] Because in the funnel, or in the CRM system, they put [leads]. ‘Oh, I’ve got a lead for the mobile voice, and I’ve got a lead for this...’ But you don’t know for sure if it will be really an order. So it can also be a lost order. And if you look, we’ve got the results out of the CRM system, especially for our model, and then you see that from 100 million euros in the funnel, we’ve got only 20,000 euros, one order... So there’s always some kind of conversion from the leads to an order.”

(Analyst)
2.6 Epistemologies in clash in TelCo

In the following sub-sections we move to the case history and illustrate how the clash of the epistemologies of the analysts and the account managers unfolded in TelCo.

2.6.1 Introducing analytics in Sales Medium: Initial resistance

The analysts from Customer Intelligence, together with the campaign manager from Marketing (responsible for managing the campaigns running in Sales Medium) introduced the CLM model to the sales teams in a kick-off presentation in the start of 2012. Initially, the analysts received a lot of resistance from the account managers, who became very protective of their way of working and did not want to be told how to change it:

“Yeah, last year... A year ago I went to a presentation of the model with M., at the team of X., and they were sitting there just like... “Oh, I know my customer myself, and why do I have to use the model... And it only takes a lot of time for me...” So it wasn't a nice presentation! (Laughs) So that's why we 've got the model, but also a lot of massage, and trying just to get the acceptance of the model. So in the first half year also the manager of sales wasn't that positive about the model.”

(Analyst, July 2013)

“First, we got a lot of lists, every week. And at first, we thought that CLM was something like that. So another list with another thing you HAVE to do. And in the beginning, a lot of account managers, me included, were a little bit against it, because, like I said, it was something we HAD to do again... And we didn’t want to, because we already had to fill so many lists and so many excels. […] Because in the beginning I got it and I put it in my mail box and I didn’t look at it at all.”

(Account manager)

The analysts tried to get the support of higher management in order to get their model accepted. After the Marketing and Sales director gave his approval to Customer Intelligence and announced that all account managers should work with the CLM model, the pressure for the account managers was higher.

“There’s always pressure from management. TelCo is pretty political, and M. [Marketing and Sales Director] is completely blue, he lives from lists. So we have to put in a list with how many appointments we made, and in how many days… All input is from lists... So a CLM list is his heaven! [Laughs.] And then it’s politically good to use it... Or to let them think you use it!”

(Account Manager)

However, the analysts also struggled with proving that the model was useful for the account managers. In order to test the effectiveness of the model, they asked the account managers to add the code “MCLM” every time they registered a lead in the funnel with the use of the CLM. Soon that became a messy situation, as some account managers refused to register the code claiming that it was time consuming for them, while many others registered the code anyway irrespective of whether they had used the model or not.

“And that was also an issue, that a lot of account managers use the model but don’t do the registration. So then we have no proof that the model is used. And six months ago, I went to the
higher management and I said “My advice is to use the model, but if you use the model, do the correct registration.” Then we can see that the model is used, but also we can prove the model on fact based, and not on beautiful eyes, but we have fact-based information and by fact-based we can prove the model.”

(Campaign Manager, May 2013)

“But the code we always [add it]... Because when a business partner calls me and says “We have a client” and it’s my client too, then I have the opportunity from him. And not from CLM. But also, I have to use the CLM code. Even if it’s not from the CLM.”

(Account Manager)

2.6.2 The clash of epistemologies comes to the surface

In the first year of introducing the model, there were a lot of tensions between the two teams. The analysts were trying to change the way work was done in Sales Medium, while the account managers were pushing back claiming that they knew better than anyone how to do sales, and they did not want to be told how to do things. The account managers argued that they had been reaching their targets successfully also without the use of analytics. They thought that the information contained in the CLM model was not true, or not up-to-date, or that it was not usable.

“Because most of the times they [Customer Intelligence team] are busy with the base, gathering knowledge, but they’re not that focused on ‘how do I put it out, who are my customers and how are they using it?’ Because they have customers. We are the customers of them. And the usability of the information is poor in my opinion. There is a lot of information, we know very much about the customers... Almost all customers in our country are clients of TelCo. So they have databases with gold, but they’re not using them, in my opinion, correctly.”

(Account manager)

Furthermore, the account managers were questioning how the insights were being calculated, while the analysts thought that these were just signs of resisting to use the model.

“Yeah, but... We’ve got a lot of questions, especially about the data, and most of it very detailed questions, but that’s mostly a sign that they don’t want to use it, or... They just ask more questions and they want to know more about it, so then they don’t have to use it at that time... If you understand what I mean... People who don’t really accept your data, they will return with a lot of more questions, instead of just using your data. [...] Yeah, details... “Oh did you look at that product?” and really mini-tiny-detailed questions, that I think ok that’s really not interesting at the moment...”

(Analyst)

The two groups had a very different idea of how work should be done, and they responded to those differences by evaluating each other's approaches in terms of their own epistemologies. For example, the analysts believed that the account managers could use the customer segmentation of the CLM model instead of spending time on looking for information and having long calls with the customers. However, for the account managers the segmentation of the CLM model was not sufficient:
“No. And I do that not, because it’s an excel sheet... It’s not what the customer says... There are probably chances to sell to the customers... But when you are in control, and you speak with your customer every two months or every two weeks, then you know where are the chances, what you’re going to sell, what you’re going to tell... And that’s for me more important than an excel sheet with A, B, C, D...”

(Account manager)

“Because the CLM model is very theoretical... It’s based on theories, big data, and on putting information together and then assuming it’s true... But I didn’t find that way of working a good way for me, I didn’t think it fits with me. Because I’m always curious and I want to ask the company itself. So with the Touch and Sell, and... Tell, I think? Yeah, I already know that, because I’m talking to these companies...”

(Account manager)

Similarly, differences existed with regard to when there was considered to be a sales opportunity:

“Sometimes I don’t believe it’s an opportunity. I know how they get the information. [I know] if it’s an opportunity or not, [I know it is a] prediction, and, [because] I have the contact with the customer, sometimes I think that it’s not correct, or something like that...”

(Account manager)

More fundamentally, the analysts and the account managers understood the customer’s reality totally different: For the analysts, this was represented by the data in the databases. However, for the account managers, the reality of the customer is more dynamic; his situation and choices can change at any moment, thus it is important to contact the customer regularly instead of using the analytics information:

“But that’s the clash, eh? Because there, they are only thinking in processes... Here, we can’t only think in processes. Here, we have to deal with the day... A day later, or a few weeks later, a customer can change his way of thinking about a portfolio of TelCo. Or he can change his way of thinking about how to solve this problem. There, they have a process that is for longer term, analyzing data. [...] But how real time is it? It’s not real time... We have seen that the information is sometimes outdated. Or it is not in real time with our mobile database. And here, it’s a changing world, and [it is changing] very fast... So how can you connect those two worlds?”

(Account manager)

“But if the customer, the ICT manager for example gives you all the information you want, you don’t really need the list because you have the true information, instead of a calculation TelCo makes. Because it changes every second. The A, B, C, D list, through the year, it changes. For now, the client can be a D, but next month he can be a C, because something is happening or changing, they need directly a fixed data line. You don’t know it, because now he thinks he doesn’t need it, but next month he will change. So... This information, you have to have directly by the client and not by list.”

(Account manager)

The different views that the two groups had with regard to the CLM model made their different epistemologies salient. Having different lenses through which they perceived knowledge, the two groups understood the model and its use very differently. The
differences in the epistemologies constituted a main reason for which the account managers could not just incorporate the CLM model in their practice.

In table 2.4 we compare the epistemologies of the analysts and account managers, based on their practices as well as their self-understandings about work and the CLM model. Following Tsoukas’ (2005) approach on organizational epistemology, we have dimensionalized their epistemologies based on three aspects: what kind of knowledge matters; how knowledge should be generated; and how knowledge claims are justified.
Table 2.4 Comparing the two epistemologies

<table>
<thead>
<tr>
<th>Theoretical aggregation</th>
<th>Epistemology of the account manager</th>
<th>Epistemology of the analyst</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Second-order theme</td>
<td>First-order concepts</td>
</tr>
<tr>
<td>What kind of knowledge matters</td>
<td>Relational way of knowing</td>
<td>“We all have some customers who demand a little bit more attention than the others. So you build up a relationship with that customer and if you build a relationship, you learn more and more about the company, about your contact person, and then you know everything by heart, and then you won’t need the CLM list, because you already know what’s happening there and what the developments in the company are, and where they’re heading to, and what their strategy is…”</td>
</tr>
</tbody>
</table>

"For example now I am looking at which profile of customers left. How did the profile of customers that left differ from the profile of customers that are still in the base and the ones that have come in? So in that way they will know on which customers to focus on, e.g. the ones who have a high risk of leaving."
### How knowledge should be generated

<table>
<thead>
<tr>
<th>Knowledge is generated intuitively by interpreting what your customer tells you</th>
</tr>
</thead>
<tbody>
<tr>
<td>- I can feel when there is an opportunity when I'm talking to my customer.</td>
</tr>
<tr>
<td>- You must always speak with your customers to feel their needs.</td>
</tr>
<tr>
<td>- You must always speak with your customers to understand their potential.</td>
</tr>
<tr>
<td>- You must listen carefully to what the customer says to find opportunities.</td>
</tr>
</tbody>
</table>

### Epistemologies in clash in TelCo

<table>
<thead>
<tr>
<th>It's a feeling! Eh... You know what your customers are doing. Do you have your forecast, so you know what will be the possibilities with customers. When they are going to decide about mobile, when they're going to decide about their workspaces, or... all those kind of things. We've got seven points within which TelCo is operating, so when I'm talking to customers, I try to organize my conversation around those seven points. And hear what they are doing, and... feel.</th>
</tr>
</thead>
<tbody>
<tr>
<td>- We calculate the probabilities that the customer will behave in some way.</td>
</tr>
<tr>
<td>- We do deep dives to explain what a trend means.</td>
</tr>
<tr>
<td>- We predict what the customer will do based on the data we have on his behavior.</td>
</tr>
<tr>
<td>- The data represents the behavior of the customer.</td>
</tr>
<tr>
<td>- We can analyze the data of customers who did X to create the profile of customers who do X.</td>
</tr>
<tr>
<td>- We need to have data to measure things.</td>
</tr>
<tr>
<td>- You need the data from the databases to estimate the potential of the customer.</td>
</tr>
<tr>
<td>- Using only facts from the databases to estimate the potential.</td>
</tr>
</tbody>
</table>

### How knowledge statements are justified

<table>
<thead>
<tr>
<th>Knowledge claims are justified with reference to the customer contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>- I know this because I spoke to the client.</td>
</tr>
<tr>
<td>- I have to speak with the customer to get the information.</td>
</tr>
<tr>
<td>- Truth is what you get from contacting the customer.</td>
</tr>
</tbody>
</table>

### Knowledge claims are justified by virtue of the experience of the account manager

<table>
<thead>
<tr>
<th>I already know my customers.</th>
</tr>
</thead>
<tbody>
<tr>
<td>- I already know this from my own experience.</td>
</tr>
<tr>
<td>- I know it in my head.</td>
</tr>
<tr>
<td>- I know well the big customers.</td>
</tr>
<tr>
<td>- Reflecting on what things they know about their customers.</td>
</tr>
<tr>
<td>- The information that the previous account manager had about the client is very important.</td>
</tr>
<tr>
<td>- The knowledge of the account manager is important.</td>
</tr>
<tr>
<td>- I trust my intuition more than the marketing information.</td>
</tr>
</tbody>
</table>

### Knowledge claims are justified based on facts

<table>
<thead>
<tr>
<th>What comes out of the analysis is fact-based.</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Trusting more the facts from the databases.</td>
</tr>
</tbody>
</table>

### "Because you can know a lot of the customer, but I don't think that the account manager also knows when the customer is interested in new products, or when he's likely to churn... all this kind of information. That's something you take from the dataset." |

### "Yes, so each customer gets his new outcome of the model. Because it depends on his behavior, which prediction he gets." |

### "REALLY fact based, yes... Because I have an excel overview of most of the models that I use. But most of the models are either acquisition or retention, so we look at what kind of customers bought the product and what kind of customers renewed the product. So it is based on possession, usage, invoice information... We say ok what is in our own database from TelCo and what can we use..."
2.6.3 Attempts to traverse the knowledge boundaries

The analysts, together with the help of the campaign manager, tried hard to get their model accepted by the account managers. They tried changing their approach:

“It's in the account manager's own decision how he can work with this, only we -and that's me and the campaign manager- give them advice on how they can work with it. But we don't say, “you have to work with it”, because the sales managers are allergic to that. Because they say “we know, we are familiar with our customers, and you don't have to say how I work with my customers". So we say ‘ok, this is a tool that you can use to contact your customers in the right way.'”

(Analyst)

Eventually they created a routine through which they would try to motivate the account managers about the usefulness of the CLM model. Thus, every quarter that the new insights of the model were out, the analysts and campaign manager made a round of presentations to each sales team in which they presented the model and explained how the columns were calculated. One month later, they visited the teams again to have evaluation sessions with them, in which the analysts asked the account managers about feedback on how the model was useful for them and how it could be improved. The account managers then had the opportunity to ask for more columns in the spreadsheet with information that they found useful. Those meetings became arenas for epistemic contestation, in which not only the analysts had the opportunity to explain the knowing practice that the CLM model entailed, but also the account managers got the chance to explain their needs and their views on the way of working.

“I think they are helpful, because then you understand how they work with it. And also with the new columns, it's always a proposal, you say I would like to add this, and then you contact this campaign marketer, but only in the evaluations, you find out what was really helpful for the account manager. And sometimes you have to change it a bit... And sometimes it's really exactly what they were looking for.”

(Analyst)

Most importantly, the evaluation sessions had contributed to making the CLM model a “living thing”, as the analysts tried to incorporate the feedback from the account managers in the subsequent version of the model. Such feedback usually had to do with adding columns of information that the account managers would otherwise have to search in different systems.

“Every quarter we refresh the model, every quarter. And nowadays I still do it, I go to the sales teams, when we have the model of the last quarter. I interview them. I ask them, “do you use the model, do you find it good, what must be improved, what's not used, what do you want to use and is not in the model...? How does the campaign go, is the presentation or the sales kit ok?” And every quarter I do that improvement loop, and that's a living model. It is not the model we had a year ago. If you see the model from one year ago and you see the model nowadays, it's a different model. There's more information to look. And in the beginning it was a very small model. And now there's a lot of information, but information that the account manager can work with.”

(Campaign Manager)
Sometimes it could also happen that the account managers offered their expertise to correct the way in which something was calculated in the model:

"Most of the questions are how they implemented, or on which basis they are expecting, where they get the information... Like we saw in the last presentation there was a question about... They were telling well you see now that the lines they have may be one, two or three lines. So a direct question was is that one ISDN30 or just an analogue line or what is it? So they thought oh we don't know that, so we are going to sort it out..."

(Account Manager)

The evolution of the model was a sign for the account managers that the analysts were trying to understand their way of working and support it, and that helped them have a more positive attitude towards them:

"I think the most important one was that we had the conversation with marketing, what kind of figures we need more, and they adjusted them in the CLM. So in the cooperation with each other, we were making progress in the CLM and in the way of working in Sales. And that was I think very important in order to use the CLM model... Yeah, [the fact] that we saw progress in the system..."

(Account Manager)

### 2.6.4 Attempts to appropriate a different epistemology

During their attempts to resolve the tensions, account managers started incorporating parts of the CLM artifact in their work. First of all, the account managers started using the list for finding information that they would otherwise have to search for in many different systems, such as expiry dates of contracts. With all the additions, the CLM model could offer a complete view of all data about the customer in the systems:

"Yeah, I think it helps a lot, because you must see it... If they don't integrate it in the model, as additional thing, then the account manager gets it either from a marketer as separate information, or he must make a deep dive in the systems to get that information out of there. And if you present it in the model, in one view, the account manager sees his client with the additional information. It costs money and a lot of time..."

(Campaign manager)

Many account managers also stated that they used the CLM list to find information they were missing before calling a client. Especially when it was a small client with whom they did not talk regularly, they could find useful information (e.g. what portfolios the customer has) in the CLM list:

"Maybe, it's very... I use it for my clients in the D segment, the little ones, yeah, when I have no vision about these clients, because I'm very busy with the big clients, CLM will give me a reminder that I have to call this client, and I have to talk to them about his mobile phones, or his fixed telephony. That's it. But it doesn't give me some new opportunities."

(Account Manager)

The CLM list was also useful as "back-up check", to have a quick look that they do not miss any information while preparing for a call:
“No, I always check everything. But very brief… I don't make too much time for it, so it's only to check and confirm, because it's... this is a tool I use for confirmation. I already know my customers, and this is like a back-up check, you know? Am I talking about the right things with the customer? Am I having the right strategic issues on this certain customer?”

(Account manager)

However, most account managers largely ignored the analytics information that (according to the analysts) constituted the core of the model, i.e. the customer segment and the CLM phase. As far as the customer segment was concerned, they kept a list with their own segmentation, based on their experience with their customers. The CLM phase proved useful only during focus days, when the account managers would shift their way of working in order to find quick wins to increase their revenues:

“On a focus day I'll often use the morning to call with the knowledge that I have, so the reminders that are in my agenda, and I will check the funnel and CLM if anything is changed. And in the afternoon, I will make the selection on CLM for new business, and also complete that with the knowledge that I have.”

(Account manager)

The account managers did not change their epistemology. They maintained the perspective that knowledge is constructed in their conversation with their customer, and they believed in sustaining a relationship with the customer as their way of working for creating leads. They did not want to convert into working on the algorithmic basis that the analysts believe in. However, they had found occasions in which they partly encompassed the epistemology that analytics represents, e.g. when they had to do a quick selection of customers for calling on a specific campaign:

“The campaigns. When I choose a mobile action or an Internet action, I choose the CLM model. [...] It's quick to check which clients have potential to call for the action. So I choose that for that week.”

(Account Manager)

Furthermore, account managers maintained that the analytics from the CLM model could be useful to think of how to approach new customers whom they did not know, or for a newly hired account manager who would receive a new set of 300 clients:

“Because the CLM model is more about contracts. When you start in Medium, you don't know what kind of contracts all of 150-300 clients have. You can make a quick start with the insights of the CLM.”

(Account manager)

In their encounters with the account managers, the analysts were also faced with an epistemology previously unknown to them. The analysts did not change their beliefs about the usefulness of analytics:

“The client segment and the phases. [...] Yeah, this is really the basis for the model, and also for every quarter, I'd really want them to use all the special things we put in it for that special month. But really the basis is the client segment and the phases. These are really essential to use in the model.”

(Analyst)
However, they tried to understand the epistemology of the account managers, by interacting with them and their sales managers, during the quarterly presentations and the evaluation sessions. Eventually, they started taking into consideration the account managers’ epistemology in the development of the CLM list. They didn’t simply add the extra information to make their artifact likeable by the account managers, but also because they understood better their information needs:

“I hope they use it on their own way. For new account managers it’s very helpful. And for the experienced ones, especially the extra columns, at the end, so like expiry dates and is a customer potential for a certain campaign, it helps them…”

(Analyst)

The analysts had realized that the CLM model could not entirely change the practice of the account managers, but that it could play a supportive role in their work:

“I don’t believe that they can’t do their work by themselves... That’s not... I think this is really helpful for them, as an extra item, to do their work properly... But I don’t want to say to them ‘ok you have to use it’. No, just ‘use it when...’”

(Analyst)

### 2.6.5 The epistemologies fail to reconcile: the two knowing practices cannot be combined

On the 14th February 2014, the higher management of TelCo announced to the account managers of the Sales Medium that their department was going to be reorganized and they would all have to be laid off. The reasons behind the reorganization were related to cutting costs and striving for efficiency. Although the relational way of knowing had been working effectively for years, the algorithmic way of knowing that analytics entailed was better aligned with the turn towards efficiency and rationalization. In fact, the analysts told us that the CLM way of working was included in all the new plans of higher management for the new Sales Medium formula. Thus, one epistemology prevailed in the clash. The analysts’ reaction to the lay-offs is also indicative of that. When we asked them for further information about how this could influence our data collection process, they replied:

“The change is not so critical for your research! The people leave, but the model and the customers stay the same.”

(Analyst, 20th February 2014)

Directly after the announcement of the reorganization, the analysts started making plans about expanding the CLM model to more sales channels. They started providing the model to the new sales channels that would replace Sales Medium: call center, business partner organizations, and the external account managers (who now worked individually by visiting customers with the goal to create leads). They also started pilot projects on providing the CLM model to other sales departments with larger customers. Following the
process, we saw that only in the call center the algorithmic epistemology was actually applied, as the system would automatically choose which customers should be called by the agents, based on the information from the CLM model. The external account managers continued using the CLM model in the same way as they used to in the old Sales Medium formula. The account managers who served the large customers did not use the model at all, as (from what we found) their epistemology was very similar to that of the medium account managers.

Reflecting on the turning of the events, the external account managers had started realizing that the need for efficiency and costs reduction of TelCo would sooner or later allow only for the algorithmic epistemology to exist in the organization:

“The thing that is going to be replaced, it’s us, that’s for sure... You know? We are already... we would be stupid if we think that our function will stand for very long time, for years after this. Because they wanted to put us out already. And it’s, eh... Like you said, I think, the chance is also big, that they chose for it, to make it needed, that you always have to put the CLM code in it, to get the lead through to the business partner. Because... what they want, is to get rid of us as externals as well.”

(External account manager, November 2014)

Indeed, in December 2014, a new reorganization was announced, which suggested the dissolution of both the call centers and the external account managers sales channel. All employees would be laid off gradually, by the end of 2016. The medium customers would be served solely by the business partner organizations. The management started making plans with the analysts on how to use the CLM model for communicating the sales opportunities to the business partners.

Consequently, it was not possible to combine the two knowing practices for managing the customers. In a large part of Sales, the relational epistemology of the account managers would fully disappear. Especially in Sales Medium, the knowing practice of analytics prevailed, leaving room only for the algorithmic epistemology to guide the management of medium customers.

2.7 Discussion and conclusions

In this chapter we set out to answer the research question: How do knowing practices shape epistemologies in the workplace and what happens when organizational members are faced with a new epistemology? In order to do so, we studied the phenomenon of introducing analytics in a telecommunications organization, as we argue that the technology of analytics has the potential to bring to the surface the differences in epistemologies of different functional groups. We performed a qualitative study in TelCo, a telecommunications organization, where analytics was recently introduced in a group of sales employees. We studied the practices of analysts and account managers and analyzed
their different epistemologies. We found that the analysts had an algorithmic, fact-based way of thinking about knowledge and knowing, while the account managers followed a relational and intuitive epistemology.

When analytics is introduced in the organization, it usually constitutes a new knowing practice aimed to automate part of the knowledge work. Our study highlights that when organizational members attempt to combine two different knowing practices to perform the same process (in the case of TelCo that is managing the customers of Sales Medium and generating leads) and to accomplish the same objective (i.e. to increase TelCo’s sales), their different epistemologies can come to the surface and clash with each other. This epistemological clash can influence the process of knowledge collaboration. In figure 2.2 we visualize in a process model how this clash of epistemologies unfolds:

Figure 2.2 How a clash of epistemologies unfolds when two knowing practices have to be combined

More specifically, when the new knowing practice is introduced in the organization to replace or to be combined with an existing one, (1) tensions will arise between the different groups who perform those knowing practices. Indeed, in the case of TelCo, tensions emerged between the analysts and the account managers, as the account managers resisted to use the CLM model and expressed their resistance in their meetings with the analysts. We already know from the literature on knowledge boundaries (Bechky, 2003; Carlile, 2002) that when groups who perform different knowing practices have to collaborate, they may have tensions due to their different situated understandings, different interests, and so forth. However, when the collaboration entails combining their knowing practices to perform one function, as in the case of analytics, the tensions may also bring (2) a clash of epistemologies to the surface. For example, in TelCo, the account managers would argue that they knew their customers and how to serve them best, in order to explain why they did not find the CLM model useful. While the analysts would suggest that it was not possible for the account managers to know all of their customers,
and that they needed to use the facts from the databases in order to know which customers to contact, when, and about which portfolios. Through those argumentations the two groups would explicate their different epistemologies.

In order to enable their collaboration, the conflicting groups need to traverse their boundaries, by engaging in practices of knowledge translation and/or transformation (Carlile, 2004). In TelCo, the role of the campaign manager as a boundary spanner (Levina & Vaast, 2005) was important, as he arranged the presentations and evaluations sessions in which the two groups would try to resolve the tensions. These meetings offered the opportunity for the two communities to express their epistemologies: the analysts had the chance to explain the analytics of the model, while the account managers expressed their need for information that was useful for their relational way of knowing. The CLM list became a “living thing” which changed every quarter based on the feedback from the account managers, and represented in a material form the attempts for the two groups to traverse their knowledge boundaries.

During the attempts to resolve the tensions and bring together the different knowing practices, the different groups may also try to appropriate each other’s epistemologies. These actions entail trying to incorporate parts of each other’s knowing practices that entail different epistemologies. In TelCo, the analysts understood that the account managers’ way of knowing was different and tried to find ways to support it, e.g. by adding the expiration dates of contracts in the CLM list. In certain occasions, the account managers found the algorithmic way of knowing effective and would use the CLM model, e.g. when they organized focus days to make quick sales on one portfolio.

However, it is difficult for the two epistemologies to reconcile. The study at TelCo showed that people cannot easily change their views over what kind of knowledge matters, as these were deeply embedded in the practices that they had been performing for years. For the analysts, it was easy to add some extra columns in the CLM list with information on expiration dates of contracts, nevertheless they did not change their views that algorithmically processed patterns of information were more credible than the subjective estimations of the account managers. The account managers would insist that the interaction with their customers was the most fundamental source of knowledge. They would always want to check if the information from the CLM model was correct by contacting their customers.

Finally, if the different epistemologies fail to reconcile, it is not possible for the two different knowing practices to coexist, and eventually the two knowing practices fail to reconcile. The organizational change in TelCo offered an occasion for one epistemology to win the battle and prevail in the organization, as such was better aligned with the changes that the company went through. This comes in agreement with Kuhn’s (1970: 23) view that “paradigms gain their status because they are more successful than their competitors in solving a few problems that the group of practitioners has come to recognize as acute”.

68
The problems in the case of TelCo were not knowledge-related, but were instead practical, such as dealing with the need to increase efficiency and reduce costs. As the algorithmic epistemology fit more with the need for efficiency, it gained much more importance than the epistemology of the account managers.

As we continued studying the account managers who stayed in TelCo and followed other trajectories in different sales channels (that adopted the CLM model later), we verified that the account managers did not change their epistemologies. This fact does not decouple the epistemology from the practice (they practically continued practicing account management in their new roles as well), but it is one more indication that people do not easily change their views on knowledge. Thus, drastic measures may be necessary if the organizations wish to fully embrace a new epistemology.

Our study contributes to literature on knowledge in organizations by bringing into the foreground the idea that people in organizations tend to develop their own epistemology, i.e. their own way of dealing with questions such as what is knowledge, how knowledge is produced and how knowledge claims can be justified (Tsoukas, 2005: 3). So far, writers on knowledge in organizations have primarily been concerned with researchers’ theories of knowledge, instead of the participants’ own epistemology. We have argued that this epistemology is situated in the participants’ knowing practices. In our case, the practice of the account managers entailed an epistemology that reflected why sustaining the relationship with the client was very important, as this was considered to be the main way to obtain knowledge for the account managers. While the analysts’ epistemology, being fact-based and algorithmic, reflected their motives behind collecting and analyzing data, in order to provide insights to TelCo’s marketing and sales employees. Taking into consideration the epistemologies of organizational members, and specifically knowledge workers, may offer us a deeper understanding of knowing in organizations.

The case of analytics is particularly interesting for the research on knowledge collaboration, as it offers us the possibility to look at how two groups try to integrate their knowing practices to perform the same practice. Most literature on knowledge collaboration has been looking at the collaboration between people from different communities of practice, who work in silos (Bechky, 2003; Bruns, 2012; Carlile, 2002, 2004). However, as analytics is introduced to automate part of the knowledge work (Newell, 2015), it has to be combined with existing knowing practices. The analysts and account managers of TelCo had to integrate two different ways of knowing in the same practice, i.e. managing customers and generating leads.

This study contributes to the ongoing discussion on knowledge boundaries, by highlighting another aspect relevant to the pragmatic boundaries (Carlile, 2002), the different epistemologies that are situated in the practices of occupational communities. Most work on pragmatic boundaries has focused on issues of power and different interests between functional groups. However, our study shows that the tensions that
emerge between the two groups—who perform different knowing practices for the same end-objective—trigger people to reflect on their knowing practices and explicate what kind of knowledge matters to them and how this is generated. Our study brought to the surface the fact that the two groups held different conceptions of what knowledge is. Such epistemological differences, despite being subtle, may impede the process of knowledge transformation (Carlile, 2004).

Our study also has implications for the field of IS and specifically analytics. Although this story could have been approached as a typical story about users’ resistance, our findings show that there is a deeper explanation for why the account managers refused to use the analytics in their work. The technology of analytics brought along a different epistemology, which might be hard to reconcile with the existing epistemology. This risk seems to be underestimated next to the enthusiasm about the perceived advantages of the technology (Davenport & Harris, 2007) and its widespread adoption. As many organizations are vastly investing on analytics, the pressure to follow this fact-based epistemology gets higher. Our study shows how TelCo’s employees have coped with this tension, and to what extent analytics has managed to change their practices. Furthermore, the study at TelCo raises concerns over the datafication of everything and the expansion of algorithmic approaches aimed to automate knowledge work (Newell, 2015). Introducing those new epistemologies may entail losing other existing epistemologies, and possibly losing the knowledge that is generated by following those paradigms.

Furthermore, our study contributes to the discussion on the role of objects in collaboration. The CLM model, instead of enabling the transformation of knowledge like boundary objects (Bechky, 2003; Carlile, 2002), revealed the clashing of different epistemologies of occupational communities in the first place, while eventually its evolution every quarter afforded the analysts and account managers to partly embrace each other’s epistemology.

Despite the contributions, our study is limited in certain ways. First of all, we had to collect data for the initial period of our study (14 months) retrospectively, so we could not observe in real time the account managers’ first encounters with the CLM model, and their initial tensions with the analysts. To overcome this limitation, we triangulated the information between multiple respondents (from different roles and different teams) and between multiple sources (documentation was used next to the interview data). Furthermore, due to confidentiality reasons, we could not follow the account managers in their visits to the customers. In order to better understand this part of their practice, we had to rely on their descriptions and compare the descriptions amongst multiple respondents. Also, we had limited encounters with the directors of TelCo (two interviews in total), which limited the richness of the data regarding their involvement in resolving the tensions between the account managers and the analysts. This was the main reason for which we could not thoroughly illustrate the power struggle that emerged at TelCo. In
addition, confidentiality reasons also prevented us from accessing the business partner organizations, in order to study how their employees used the insights of the CLM model. Thus, while we could conclude that the epistemology of analytics prevailed inside TelCo, we could not investigate whether the employees at the business partner organizations embraced the epistemology of analytics in their practices, or whether they adopted it only symbolically, like the account managers. Moreover, further research is needed to observe the long-term effects that may result from having only the epistemology of analytics prevalent in the organization, and from downplaying the epistemology of account managers.

Finally, the generalizability of our findings to clashes between other epistemologies at work is still to be determined. As we studied the introduction of analytics in a sales organization, it was easy to compare the knowing practices between the analysts and the account managers. Also, their profound differences easily triggered the different epistemologies to be explicated. Our findings may hold in settings where the two knowing practices differ substantially, such as when analytics is introduced to architecture designers (Whyte et al., 2015). However, it is not yet certain whether the epistemological clash would have come to the surface in a different situation with less salient differences between the knowing practices, e.g. in the introduction of analytics in a technological startup. Future research should be performed to evaluate whether our findings could also apply to such situations.