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Crunching the numbers Studying the enactment of analytics in an organization

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2016

document version

Publisher's PDF, also known as Version of record

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citation for published version (APA)

Pachidi, S. (2016). *Crunching the numbers Studying the enactment of analytics in an organization*. ABRI.

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Summary

We have come to live in a world where almost everything (individual everyday actions, business actions and transactions, environmental events, and so forth) can be quantified and stored in archives, databases or even large data grids. Data –and the information produced by analyzing the data– is considered to be indispensable in order to make sense of the world, create theories, and make decisions. Our everyday and organizational practices are blended with data, quantifications, and insights from data analysis. *Analytics*, the technology that includes practices, skills and techniques, such as predictive modeling and optimization, to extract actionable insights from data (Davenport & Harris, 2007), has attracted a lot of attention as the way to make faster and better informed choices.

The eagerness of organizations to ground their actions on analytics insights can be explained by the fact that *rationality*, i.e. choosing the optimal means to reach pre-established ends (March & Simon, 1958), has been established as a normative ideal for making choices in organizations (Cabantous & Gond, 2011; Jarzabkowski & Kaplan, 2015). Numerous tools have been developed for helping organizations reach favorable outcomes and several procedures (such as planning, budgeting, strategic analysis, and operations research) have evolved following rationality as the fundamental way for guiding, justifying and interpreting actions (March, 2006). More specifically, such tools and procedures are designed with the notion that “action is or should be derived from a model-based anticipation of consequences evaluated by prior preferences” (March, 2006: 202). This notion has been conventionalized into the *technologies of rationality* (March, 2006), which help make choices based on model-based assessment of the likelihoods of possible future ends and of pre-established preferences among those ends. Analytics, a technology of model-based rationality that has flourished recently, is presumed to optimize the selection of alternatives and to help increase rationality in organizational actions and procedures.

While the availability of data and the techniques to process it and analyze it are sophisticated enough to reach the ideal of rationality in organizational actions, it is intriguing to study what actually happens when a technology like analytics comes into use in organizations. This is what I have done in this dissertation, where I am studying how organizations enact analytics in their quest for rationality. In order to reach theoretical insights from this phenomenon, I break open the black box of analytics, which thus far has been treated as a technological juggernaut (Zuboff, 2015). I take a practice-based perspective (Feldman & Orlikowski, 2011; Nicolini, 2012) that helps me divert from dualisms of cognition and action, material and social, and so on. I look at the

sociomaterial practices (Orlikowski, 2010) in which people enact analytics, performing and shaping the notion of rationality at the same time. While both academic researchers and practitioners are already on the bandwagon of analytics, little is known about how organizational members really use it in their practices. Therefore, my research was guided by the research question:

RQ: How is the technology of analytics enacted, in the organizational quest for rationality?

In order to answer my research question, I performed an inductive longitudinal qualitative study at TelCo, a large telecommunications provider offering telecom services to both end-consumers and businesses. I collected data from March 2013 until February 2015, in the Marketing & Sales department of the business division. My main interest lied on how the account managers coped with the introduction of an analytics tool for model-based customer management, namely, the Customer Lifecycle Management (CLM) model. Being informed by the practice lens (Feldman & Orlikowski, 2011; Nicolini, 2012), I studied the practices of account managers from multiple sales channels, and the practices of analysts who analyzed data for customer intelligence. I collected data mainly via interviews with analysts, account managers, middle managers, marketers and higher management, and I complemented those with ethnographic observations and documentation. I analyzed the data following a process research approach, which departs from the variance logic and instead focuses on how issues emerge and develop over time (Langley, 1999).

The analysis of my data yielded three sub-topics of this research that were addressed in the chapters 2, 3, and 4 of this thesis: studying how a clash of epistemologies unfolds when analytics is introduced in the organization (chapter 2); exploring the phenomenon of transparency that is afforded by digital technologies (chapter 3); and investigating what happens when analytics is used in the organizational setting for symbolic reasons (chapter 4).

Chapter 2 takes a knowledge perspective on analytics, in order to explain what happens when organizations introduce this technology. The knowledge perspective is aligned with the practice-based perspective (Feldman & Orlikowski, 2011; Nicolini, 2012) and conceives of knowledge as situated in historical, social and cultural contexts (Nicolini et al., 2003), focusing on the process of knowing as an ongoing social accomplishment emerging in everyday practice (Orlikowski, 2002). The introduction of analytics in TelCo's sales department was performed very problematically, as tensions emerged between the analysts, who developed the CLM model to automate customer management in TelCo's Sales Medium department, and the account managers of Sales Medium, who were responsible for sustaining the relationship with the medium-sized customers of TelCo and for generating leads. The knowledge perspective directed our attention to the study of knowledge boundaries (Bechky, 2003; Carlile, 2002) between those two groups. One main finding of this chapter is that the tensions that emerged between the analysts and the

account managers did not only occur because the two groups had very different knowing practices, but more fundamentally, because they had different epistemologies, i.e. they had different interpretations regarding what is the source of knowledge, how knowledge can be obtained, and how knowledge statements are justified (Tsoukas, 2005). The confrontation of analysts with the users of the analytics tools can bring out epistemological differences, which explain the difficulty for the two groups to collaborate and to incorporate their different ways of acting in the same practice. The second key finding of the chapter is that it is difficult for the different epistemologies to reconcile. In the study at TelCo we analyzed how the clash of the two epistemologies unfolded. While the two groups tried to resolve the tensions and to bridge their epistemologies, it was hard to accomplish that, and eventually only one epistemology prevailed (that of the analysts), resulting in a new knowing practice that did not involve the account managers anymore. In response to the overall research question underlying this dissertation, chapter 2 suggests that organizational members who are expected to use the analytics tools may use them differently from what the analysts expect, or even refuse to use them at all. This can be explained because within their sociomaterial practices, people not only have situated knowledge and situated processes of knowing, but they also have situated understandings about what constitutes valid ways of knowing. The confrontation with analytics can bring out their epistemological differences with the epistemology entailed in the technology of analytics, and can lead to clashes and resistance to use the analytics tools.

Chapter 2 contributes to the literature on knowledge and knowledge collaboration in different ways: First of all, the study at TelCo illustrates how epistemologies are situated in knowing practices. By illustrating the epistemological differences and how the clash of different epistemologies unfolded, the study develops further the notion of pragmatic boundaries and thus adds to the literature on knowledge collaboration. Furthermore, the case of analytics informs the research on knowledge collaboration by looking at how two groups try to integrate their knowing practices to perform the same practice. Finally, the study at TelCo sheds light on the complexities that arise when organizations attempt to automate part of knowledge work with algorithms such as those involved in analytics artifacts.

Chapter 3 unpacks the phenomenon of transparency that is afforded by analytics, as well as digital technologies in general. Transparency has been an important concept for management of organizations (Bernstein, 2012), as it constitutes casting light upon behaviors, activities, routines, output and performance that emerge (usually) at the lower hierarchical levels of organizations, which would otherwise remain concealed (Roberts, 2009). Chapter 3 focuses on how account managers rendered their actions visible through the use of the Customer Relationship Management system in TelCo Marketing & Sales. The CRM system included several analytical features that offered visibility to multiple

stakeholders in real time, while it also informed about past actions and performance, and it helped construct predictions about the future. The study takes a sociomaterial practice lens (Orlikowski, 2010) and focuses on how sociomaterial practices are temporally enacted, using the chordal triad of agency approach (Emirbayer & Mische, 1998), in order to illustrate how transparency and the lack thereof (i.e. opaqueness), emerge through the daily actions of account managers, while using the CRM system for managing their sales work. The main finding of this chapter is that transparency is performative, in the sense that the action of making an object (artifact, action, information etc.) visible can change the object that is rendered transparent. More specifically, the study at TelCo shows that transparency is sociomaterially constructed in the interactions of the account managers and other stakeholders (sales managers, sales specialists, analysts, marketers) with the CRM system. Through the enactment of the CRM system, transparency could refer to transparency in the present, past, or future. Depending on their temporal orientation, the account managers would use the CRM system while being influenced by the transparency that was afforded, and could submit data that would sometimes make their actions and information transparent, while at other times it would make them opaque. As far as the main research question of this research is concerned, chapter 3 suggests that organizational members may use analytics in ways that could render their actions opaque rather than transparent, by “playing with the numbers” and with other data that is stored and later analyzed by the models. The notion of transparency is sociomaterially constructed through the enactment of analytics, and it is performative, thus it is consequential for how organizational members further enact the technology of analytics.

Chapter 3 contributes to the literature on transparency in organizations, and specifically to recent perspectives that question the role of transparency in organizations (Bernstein, 2012), by suggesting that the material enactments of the transparency practices are performative. More specifically, it suggests that the sociomaterial practices through which organizational members make their actions visible reconfigure the world and thus they are consequential for how those practices will be enacted in the future. Furthermore, the insights from chapter 3 are more generally relevant to the recent tendency towards taking a performative perspective to study technology in organizations (Orlikowski & Scott, 2015). The study at TelCo helps further understand the notion of performativity by highlighting the temporality that is inherent in this process. More specifically, the reality that is reconfigured has a temporal dimension, and the enactments of sociomaterial practices can draw the attention towards the past, present, or future while performing different consequentialities.

Chapter 4 analyzes the symbolic actions through which the account managers tried to conceal their non-conformity with using the analytics artifact (the CLM model). The study at TelCo showed that these symbolic actions had unintended consequences for the account managers. First, they contributed to the institutionalization of the CLM model in

the Sales department, while later they also started influencing the actual practices of the account managers. In order to make sense of this phenomenon, chapter 4 turns to institutional theory (Barley & Tolbert, 1997; Meyer & Rowan, 1977; Tolbert & Zucker, 1983) and specifically to micro-institutional foundations, and tries to unpack the process of symbolic adoption (Collings & Dick, 2011; Kostova & Roth, 2002). More specifically, the study follows a process research approach (Langley, 1999) to investigate how actions of symbolic adoption influence the process of institutionalization, and what unintended consequences arise for the actors who perform them. In response to the main research question of the doctoral thesis, chapter 4 suggests that actors may use the technology of analytics only symbolically, in order to conceal their resistance, and to appear as if they comply with the pressure to use analytics to act more rationally. However, the study shows that these symbolic actions can have unintended consequences, such as making the technology more and more embedded in the organization, and influencing the organizational practices in the realm of pragmatic action.

Chapter 4 contributes to the field of institutional theory and specifically to micro-institutional foundations, by investigating the role of symbolic adoption (Collings & Dick, 2011; Kostova & Roth, 2002) in the process of institutionalization (Barley & Tolbert, 1997). The study shows that not only pragmatic actions, but also symbolic actions (Brown, 1994) can influence the creation of institutions. This can happen when symbolic actions of concealment interplay with other symbolic actions, such as the ones performed for impression management. This interplay can influence the institutional order, but it can also cause changes on actor's practices on the realm of pragmatic actions. In addition, the study unpacks the process of symbolic adoption, through which actors conceal their non-conformity with the institutional pressures (Oliver, 1991). This process has often been black-boxed in the large organizational sector studies on institutional theory. Finally, the study contributes to theories of institutional change by illustrating how the new epistemic practices of acting based on data and analytics may foster a myopic process for the emergence of institutions.

This dissertation develops the notion of rationality in practice, to illustrate how rationality is constructed in a world comprised of sociomaterial practices. Taking a sociomaterial practice perspective on rationality indicates that what is considered to be a rational way of acting emerges in the sociomaterial practices of actors. The study at TelCo shows that the material enactment of rationality is performative: rationality (and specifically its constitutive elements such as which goals matter most, and which decision rules will be used) is configured while the actors are performing a practice, and this act of configuring is consequential for how the practice will be reconfigured and how it will be performed in the future. In other words, rationality is both shaped by as well as shapes sociomaterial practices. Taking that into consideration, one can better understand why tools of model-based rationality are enacted differently in different practices and

influence people's choices and actions in various ways. Overall, this thesis suggests that more data and analytics do not necessarily entail more rational actions; because there can be different conceptions of rationality situated in the sociomaterial practices; because producing data for visibility can also have other performative consequences; and finally because information may often be used symbolically.

Finally, the thesis has several implications for practice: First of all, it focuses managers' attention on the use of tools for model-based rationality, and suggests that the way these tools are used influences how rationality will be enacted. This means that one cannot expect organizational members to use analytics tools in the same way, and that rationality is shaped while a practice is performed. Thus, efforts to increase rationality in the organization need careful consideration of how they suit the different practices; otherwise they may lead to clashes and other perverse effects. More specifically, the findings of this research have practical implications for analysts and other actors who are involved in the development of analytics, as well as for managers who decide to introduce analytics in their organizations in their efforts to increase rationality.

References for the summary

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