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Unpacking researchers' creativity and imagination in grounded theorizing: An exemplar from IS research

Marlei Pozzebon ^{a,*}, Maira Petrini ^{b,1},
Rodrigo Bandeira de Mello ^{c,2}, Lionel Garreau ^{d,3}

^a HEC Montréal, 3000, chemin de la Côte-Sainte-Catherine, Montréal (Québec), Canada H3T 2A7

^b PUCRS, Avenida Ipiranga, 6681, Prédio 50 FACE - Partenon, Porto Alegre, RS, CEP 90619-900, Brazil

^c FGV EAESP, Av. 9 de Julho, 2029 - Bela Vista, São Paulo, SP, CEP 01313-902, Brazil

^d Université Paris-Dauphine, Bureau P421, France

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ABSTRACT

Although interest in the use of grounded theory methods has been increasing over the last decade, [Urquhart, Lehmann, and Myers \(2010\)](#) take note of the criticism that, in fact, such use has not yet produced higher levels of theory development in IS research. Along these lines, the current essay intends to make two main contributions. The first is to respond to the recent call for more studies developing grounded theorizing in IS research by providing a detailed description of the application of grounded theory methods in an emergent research area that combines IS and sustainability. The second, to extend current interpretations of grounded theory's basic characteristics by focusing on one important element: researchers' creativity. We argue that the role of researchers' creativity and imagination in the implementation of grounded theory methods has rarely been emphasized and should be the subject of further reflection. Although imagination is, from our perspective, inherent and crucial to any cognitive or intellectual process, the fact of being frequently neglected in IS research precludes its mobilization as a more purposeful influence in the process of building new theories.

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* Corresponding author. Tel.: +1 514 340 6754, +1 514 340 6188 (Secretary); fax: +1 514 340 6987, 3.246 (Office).

E-mail addresses: marlei.pozzebon@hec.ca (M. Pozzebon), maira.petrini@pucrs.br (M. Petrini), rodrigo.bandeira.demello@fgv.br (R.B. de Mello), Lionel.Garreau@Dauphine.Fr (L. Garreau).

¹ Tel.: +55 51 3353 4810.

² Tel.: +55 11 3799 7740.

³ Tel.: +33 1 44 05 49 17 (Bureau).

1. Introduction

Although the connecting of data and theory lies at the heart of strategic research activities, theory building remains one of researchers' biggest challenges. Whatever methodological approach is used, there is always an untraceable step that relies on the researcher's insight and imagination (Weick, 1989). Making sense of and interpreting data is a creative process, for both writer and reader. Our work is inspired by Langley's (1999) paper in which she evokes three processes involved in theory building: induction, where data drives generalization; deduction, where theory drives hypothesis testing; and inspiration, where creativity and insight hold sway. This last process, inspiration, seems to be crucial in plausible and sound connection of empirical data, prior knowledge, experience, readings and imagination. Langley (1999) argues that theorizing may mobilize both inductive and deductive approaches, iteratively or simultaneously, guided by inspiration. Sensemaking being the objective, "let us make sense whatever way we can" (p. 18).

Whenever inductive theorizing is under consideration, grounded theory inescapably enters into the discussion – sometimes approached as a methodology (Elmes, Strong, & Volkoff, 2005; Jones & Noble, 2007), sometimes as a method (Fendt & Sachs, 2008; Lings & Lundell, 2005) or a set of coding techniques (Levina, 2005; Vaast & Levina, 2006). Indeed, while Strauss and Corbin (1990, p. 24) clearly define grounded theory as "a qualitative research method that uses a systematic set of procedures to develop an inductively derived grounded theory about a phenomenon", Glaser (1992, p. 16) posits it as a "general methodology of analysis linked with data collection" that "uses a systematically applied set of methods to generate inductive theory about a substantive area".

When researchers refer to grounded theory as a methodology, they refer to a general philosophy of conducting inductive research. In this essay, we refer to grounded theory as a method, in line with Strauss and Corbin's definition of grounded theory as a set of techniques that guide the researcher in data collection and analysis (Elharidy, Nicholson, & Scapens, 2008). Such a method or set of techniques is designed to help researchers in producing innovative theories or explanations of a phenomenon in a delimited context. Applying grounded theory means developing theories that would explain a phenomenon in ways that have never been articulated before. However, the concept of creativity has not been explicitly addressed in the pioneers' work (Glaser & Strauss, 1967) or in latest versions of grounded theory (Corbin & Strauss, 2008; Morse et al., 2008).

We recognized one seminal concept of grounded theory that is inherently connected to creativity: theoretical sensitivity. Sensitivity is the "ability to pick up on subtle nuances and cues in the data that infer or point to meaning" (Corbin & Strauss, 2008 p.19). Theoretical sensitivity should enable the researcher to creatively develop innovative theories. A set of techniques has been proposed to increase the researcher's capacity for theoretical sensitivity (Clarke, 2005; Merlino & Martinez, 2007; Scott, 2004) but, still, those techniques for sensitizing the research do not stand alone: they are subject to the imaginative process that researchers go through in order to make numerous choices during data analysis and interpretation. To what extent a researcher's choices do not transgress methodological principles yet, at the same time, are capable of seeing beyond data description towards innovative explanations is an important challenge for grounded theorists and remains a question meriting examination.

Not surprisingly, grounded theory is considered a risky research venture (Suddaby, 2006). The risks of the delicate balance between objectivity and subjectivity are manifested in several ways: the unavoidable presence of preconceptions when analyzing data; the predisposition to avoid considering incoming data that would cast doubt on previous analysis; the forcing of data into established frameworks; working with "blinkers" when coding the data (Alvesson & Sköldbberg, 2000) and, most detrimental to inspiration, a blind adherence to a rigid method. Regarding this last "risk", Urquhart (2007) notes that coping with a set of guidelines, as grounded theory authors often propose, does not imply confining the creativity of researchers: prescriptiveness might come to be at odds with the essentially creative and emergent nature of the grounded theory process. Grounded theory's procedures "were designed not to be followed dogmatically but rather to be used creatively and flexibly by researchers as they deem appropriate" (Strauss & Corbin, 1990, p. 13).

While a number of IS researchers corroborate the importance of mobilizing prior knowledge in grounded theorizing (e.g., Boudreau & Robey, 2005; Mahnke, Wareham, & Bjorn-Andersen, 2008), comparable importance has not been attributed to the role of IS researchers' insight, imagination or creativity.

Our literature review of IS journals revealed an absence of this topic. We reviewed all grounded theory-related articles published between 1996 and 2011.⁴ We scrutinized those having the words “imagination” or “creativity” in the text. Two texts mention, respectively, creativity (Urquhart, 2007) and imaginative interpretation (Chakraborty, Sarker, & Sarker, 2010), but none had purposively engaged in discussion of the role of imagination or creativity in grounded or inductive theorizing in IS research. The same absence was identified by Weick (2006) in organizational research, noting that imagination has not been much of a concern among scholars who examine learning and knowledge.

Although imagination is, from our perspective, inherent and crucial to any cognitive or intellectual process, the fact of being frequently neglected precludes its mobilization as a more purposeful influence in the process of building new theories. We argue that imagination and creativity play a large role in driving the researcher's choices during data analysis and interpretation and that the role of IS researchers' imagination in the implementation of grounded theory methods has rarely been emphasized and should be the subject of further reflection. The present essay addresses the issue of building innovative theories through grounded theorizing. Urquhart et al. (2010) observe that, despite increasing interest in the use of grounded theory methods over the last decade, such use has not yet produced higher levels of theory development in IS research. Therefore, the current essay intends to make two main contributions. The first is to respond to a recent call for more studies developing grounded theories in IS research (Urquhart et al., 2010) by providing a detailed description of and lessons learned from the application of grounded theory methods in an emergent research area that combines IS and sustainability. The second is to extend current IS interpretations of grounded theory's basic characteristics by including one important element: researchers' imagination.

The essay is structured in five main sections. Following this introduction is a presentation of our ideas regarding the importance of more purposively addressing the role of researchers' imagination and creativity in grounded theorizing. We then describe in detail our application of grounded theory method, identifying the most important lessons learned in the form of suggestions and insights. Finally we present the discussion and concluding remarks.

2. Innovative grounded theorizing

2.1. Defining imagination and creativity

Creativity has been the focus of much research in disciplines like psychology, education, art, and science (Sullivan & Ford, 2010). Organizational creativity, in turn, has grown to become an important topic particularly among organizational behavior researchers (Litchfield, 2008). Contributors from all the above areas generally agree that creativity is a multifaceted construct which is best defined with reference to the novelty and usefulness of outputs like products or ideas (Sullivan & Ford, 2010). Therefore, when defined in terms of the final product, creativity involves the ability to produce novel and useful ideas (George & Zhou, 2007), novel solutions that might work for various tasks (Gilson, Mathieu, Shalley, & Ruddy, 2005), or similar ways to describe original and practical ideas (Ng & Feldman, 2008). Besides that traditional literature employing a product-focused definition, other approaches to creativity have also focused on the process and people involved in the process as well. When defined in terms of process, at least in the management literature, creativity is commonly characterized as a cognitive process, one which is often confined to the “activity of the mind” of individuals (Kern, 2006). However, a number of researchers relate creativity to conceptual thinking abilities mobilized collectively (Hanke, 2006).

The concept of imagination has a similar developmental path, spanning many disciplines like psychology, communication, literature, art, music, architecture, history, anthropology, philosophy and cultural studies (Schau, 2000). Curiously, among the widely referenced definitions, we found two qualities of the output of an imaginative person or process – the unusual and effective (Barrow, 1988; White, 1990) – that are quite similar to the core features of creativity – novelty and usefulness (Egan & Judson, 2009). Another dichotomy present is that between a subject-oriented approach, wherein imagination is an individual faculty, and a context-oriented, one that takes into account the impact of the social context. This

⁴ The review was based on major indexes, including ABI Inform, Emerald, Science Direct and JSTOR.

leads to a political view of imagination: the capacity to change facts, or to act, fundamentally depends on imagination (Bottici, 2011). We concluded that, although creativity and imagination are not synonymous, they might be applied as equivalent constructs in situations involving theorizing.

Some authors make an explicit link between experience and creativity/imagination. For example, Schau (2000) defines imagination as a process of merging sensory stimuli and experience with abstract conceptualization to form a knowledge framework. This means that experience, both individual and collective, is understood, acknowledged and mobilized through the work of imagination and creativity. Similarly, Kern (2006) considers creativity as the act of recombining existing elements of culture, which are apprehended through experience, in patterns that make sense to other people.

In organization theory, Karl Weick worked on the role of imagination in a number of papers (1989, 2006). For our purposes, the most important is the one dealing with the process of theory construction, “portrayed as imagination disciplined by evolutionary processes analogous to artificial selection” (Weick, 1989, p. 516). In this article, we advance a similar argument: grounded theorizing involves imagination disciplined by the techniques offered by grounded theory, mainly constant comparison.

2.2. Imagination and creativity while constantly comparing

Motivated by their dissatisfaction with predominant hypothetical-deductive practices in social science research, Glaser and Strauss presented grounded theory in a book published in 1967. After this seminal work, several other books and articles followed, detailing and improving the method, but not without controversy (Glaser, 1978, 1992, 1994, 1998; Glaser & Holton, 2004; Strauss & Corbin, 1990, 1994, 1997). The emergence of two different main strands or versions of grounded theory – Glaserian and Straussian – was triggered by the publication in 1990 of Strauss and Corbin's book *Basics of qualitative research: grounded theory procedures and techniques*. Reacting to the trend of using grounded theory as a kind of unstructured and “artisanal” way to analyze data qualitatively, the authors proposed well-defined and structured procedures for applying the method. In turn, Glaser's reaction was the publication two years later (1992) of the book *Emergence vs. Forcing: Basics of Grounded Theory Analysis*, in which he criticized the proposal made by Strauss and Corbin (1990). In Glaser's (1992) view, the proposed formalization was too restrictive, compromising the emergence of concepts and forcing them into a preconceived mold.

We found examples of both strands in IS research. Elmes et al., (2005), Fernandez (2004), Orlikowski (1993) and Ribes and Bowker (2009), illustrate adoption of a Glaserian approach, while Boudreau and Robey (2005), Henfridsson & Lindgren, (2005); Levina and Vaast (2008), Mahnke et al., (2008) and Vaujany (2008) exemplify a Straussian approach. According to our literature review, the latter appears to be more popular among IS researchers. Comparing these two streams with regard to their potential for creativity, we do not think that, by themselves, Straussian or Glaserian streams lead to more or less creative process of theorizing. In our empirical work, the main reason for our selection of a Straussian approach was, indeed, Pandit's (1996) article, which offered a well-defined set of steps to following Straussian techniques. Because this research was part of a doctoral research, we look for a more structured approach to guide the student's work. However, although structured, this way of analyzing did not inhibit creativity. On the contrary, we believe that more than the grounded theory approach – Straussian or Glaserian – the epistemological perspective and/or the researchers' style/attitude are the factors that have more weight in determining whether or not creativity is mobilized in the theorizing process. In addition, as we argue in this essay, we believe in the possibilities of disciplined imagination.

Grounded theory method supports researchers in the process of generating new theories by means of four basic elements: *concepts*, *categories*, *properties* and *propositions*. Concepts are the basic units of analysis but not the actual data per se (Pandit, 1996). The collection of incidents, events and happenings are taken as, or analyzed as, potential indicators of phenomena, which are thereby given conceptual labels. “Only by comparing incidents and naming like phenomena with the same term can the theorist accumulate the basic units for theory” (Corbin and Strauss, 1990, p. 7), i.e., concepts. Categories are higher in level and more abstract than the concepts they represent (Corbin & Strauss, 2008). They are generated through the same analytic process of making comparisons to highlight similarities and differences. Properties correspond to qualifiers of categories, usually taking the form of adjectives or adverbs related to the categories. Propositions, in turn, indicate persistent relationships between categories.

In addition to these four basic elements, we highlight two features that we experienced as fundamental to the analytic process: its *inductive* and *iterative* nature. It is inductive, because the generation and development of concepts, categories and properties occurs via a systematic process of data collection and analysis. The emphasis of grounded theory is on learning from data rather than from any preexisting theoretical viewpoint. The researcher is invited to avoid defining a conceptual framework before beginning data collection and analysis in order to guarantee that concepts, categories and properties will emerge from systematic analysis of empirical data. The inductive nature of grounded theory seduces several researchers, who define their methodological approach as “inductive” grounded theory building approach (Adam & Urquhart, 2009) or “inductive” process in line with a grounded theory approach (Hansen & Rennecker, 2010).

The analytic process is also iterative, because data collection is very dynamic, being guided by theoretical sampling, a process in which researchers collect and analyze data and, based on that analysis, decide what kind of additional data should be collected and analyzed. This approach to collecting data, which is carried out concurrently with analysis, differs from other classic qualitative methodologies that adopt a pre-planned and sequential approach, such as doing all the interviews first and then analyzing all the transcriptions. As data is being collected, analysis and conceptualization take place iteratively through constant comparison.

Constant comparison is the central analytical process in grounded theory. It occurs along with the three types of coding suggested by Strauss and Corbin (1990): *open*, *axial* and *selective*. Open coding deals with the fracturing, labelling and categorizing of phenomena as indicated by the data. It allows the researcher to open up possible avenues for interpreting the data. Fracturing the data through microanalysis of bits of data generates a great number of concepts, some of which will be developed as categories, the building blocks in grounded theory construction. On the other hand, open coding fractures the data into concepts and categories, the next step being to put those data back together in new ways by making connections between those concepts and categories. Axial coding links a category to its subcategories in a set of relationships that Strauss and Corbin (1990, p. 99) call the “paradigm model”.

The task is to link the categories in such a way that explanation and theory emerge from the data. Strauss and Corbin (1990) call this step “history elaboration”, the construction of a descriptive narrative about the phenomenon under investigation. What it is called selective coding involves a phase of looking for the central phenomenon among the categories that have been developed, so as to form a coherent and parsimonious theoretical framework. The discovery of core categories, defined by Strauss and Corbin (1990) as the central phenomenon around which all the other categories are linked, means to make a synthesis of the entire history built from the collected and analyzed data and to be able to explain differences and similarities found in the events taking part in the phenomenon.

In sum, the process of coding is non-linear and involves several iterations between data and the “theory” under development. At each step, the inductive process enables the researcher to add a step towards construction of a model on the abstract level. The recursive loops are triggered by theoretical sampling, i.e., the choice of collection of new data is guided by previous analyses. Data are collected to improve the model, i.e., to find new variations in the phenomenon (if they occur), to saturate the categories, and to verify previous links between categories (Bandeira-De-Mello & Garreau, 2009).

As Fig. 1 shows, there are two types of comparisons in the Straussian version: *theoretical* and *incident-incident* comparisons. While the former serve as a way of discovering or unveiling new insights – induction – the latter serve as a means of verifying and revising interpretations – a form of abduction, which elevates grounded theorizing from mere mechanical coding to a creative process. Abduction involves imaginative interpretation while, at the same time, forcing the researcher to seek accountability from the empirical data (Chakraborty et al., 2010).

In Fig. 1, theoretical comparisons usually represent a movement from the empirical domain to the abstraction level, as possible concepts, categories and properties are identified and defined. Incident-incident comparison refers to movement from the level of abstraction to empirical material, guided by the theoretical sampling of incidents. These two movements making up the constant comparison method make possible the generation of rather conclusive findings, a goal of grounded theory since its creation (Glaser & Strauss, 1967). What the Straussian version added to this original work was the possibility of making theoretical comparisons relying on researchers’ previous knowledge, experience and introspection. This is the subjective, creative and even artistic side of the process, which must be balanced by objective verification

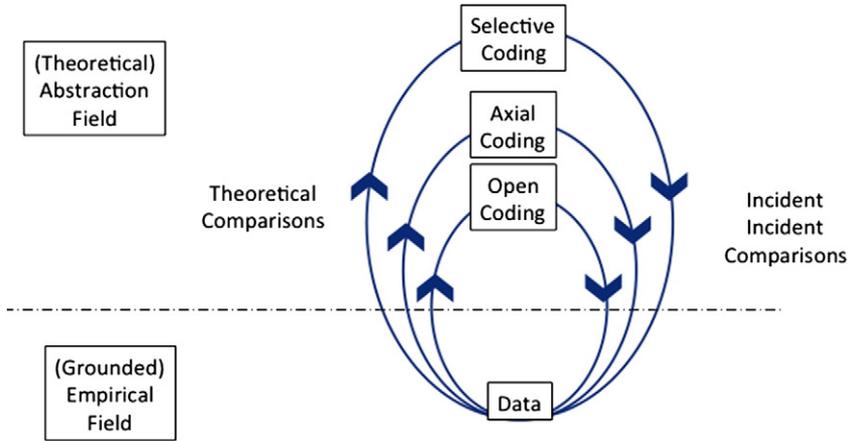


Fig. 1. The coding process.

of the researcher's insights, as [Strauss and Corbin \(1990\)](#) argue. The authors encourage researchers to use their knowledge and experience to "enhance theoretical sensitivity rather than obscuring vision", thereby enriching data collection and analysis ([Jones & Noble, 2007, p. 86](#)). The innovation of Strauss and Corbin's work is the notion of balancing subjectivity and objectivity, which is made possible by the movements underlying the two types of comparisons.

From the above, creativity and imagination find their way particularly through theoretical comparisons. The researcher's choice of where to look for new data, i.e., new incidents to compare, may be invested with creativity. Creativity, in the sense of generating ideas, can be stimulated in a number of ways: collective analyzing sessions; sensitization through knowledge of the arts, such as songs, painting and architecture; and the use of *in vivo* creativity, i.e., creativity emanating from the research participants themselves, such as metaphors ([Bandeira-De-Mello & Garreau, 2009](#)).

In the next section, after briefly describing the subject of our empirical work, we provide a detailed description of the different techniques of grounded theory method we have applied, where we depict the most important lessons we have learned and we illustrate the importance that imagination and creativity play in building a relevant theoretical framework out of empirical data.

3. Applying grounded theory for researching sustainability in IS

Sustainability has been among the most important issues to have emerged in the last decade at a global level. Sustainability takes into consideration environmental, social and economic dimensions and adopts a long-term perspective, based on meeting the needs of the present with social responsibility and without compromising the ability of future generations to meet their needs ([Bruntland, 1987](#)). The increasing importance of sustainability today should be evaluated within the complex context of globalization, deregulation and privatization, where social, environmental, and economic inequalities continue to increase ([United Nations Industrial Development Organization \(UNIDO\), 2011](#)). In light of this, managers need to take into consideration not only increased sales and profits and/or decreased costs, but also sustainable development of the business itself and of the surrounding context. A growing number of companies worldwide have engaged in serious efforts to integrate sustainability into their business practices ([Pozzebon, Arroyo, & Fleury, 2010](#)).

Despite the surge of interest in and concern with sustainable practices, their effective implementation faces serious obstacles and more research is needed to promote theoretical and practical advances in the management and IS fields ([Jenkin, Webster, & McShane, 2011](#)). Although corporate efforts to integrate sustainability into business practices have been reported in an increasing number of publications worldwide, they have been centered mostly in North American and European contexts ([Pozzebon et al., 2010](#)). In addition, when this empirical research was carried out, in 2004–2005, the number of substantive

publications on sustainability and social responsibility, in both management and IS literature, was drastically lower than today. Virtually non-existent were studies focusing on the experiences of firms located in developing regions trying to integrate sustainability into their business practices, particularly in Africa and Latin America.

Our research was motivated by the wish to enhance the place occupied by information and communication technologies (ICT) projects in helping organizations to implement and monitor sustainable business practices. We paid particular attention to one phase of any ICT project: the definition of project requirements, i.e., the phase where indicators, metrics and other relevant information are defined and integrated into monitoring and reporting activities (Moss & Atre, 2003) The purpose of our empirical work was to investigate how to promote effective alignment of information planning and the incorporation of sustainability into business practices, considering the context of companies that operate in Latin America and, specifically, in Brazil, that have excelled in terms of sustainability initiatives.

Keeping in mind our research interest, the main reason that led us to the choice of grounded theory as preferred method involved its emphasis on learning from empirical data instead of from existing theoretical models. Our objective was to avoid starting with a preconceived model but, rather, to produce a model growing out of data collection and analysis. Regarding the scarcity of theoretical models with focus on sustainability-ICT alignment when the empirical work was carried out, particularly in a Latin American context, the contribution of a model generated by grounded theory method seemed worthy of scrutiny. Before describing the process involving the intricate steps of data analysis, we would like to present the emergent theoretical model we have produced, with the aim of making the theoretical building process more understandable. In this essay, we do not report all the material, arguments and results we have developed regarding the substantive area, which was reported elsewhere (Petrini & Pozzebon, 2009).

Grounded in systematic execution of several steps of the adopted methodological approach, the conceptual model presented by Fig. 2 aimed at better understanding of the process of aligning information planning with sustainability integration within corporate business processes. Although it grew out of a Brazilian context, we believe our conceptual model is theoretically transferable to other similar contexts, reinforcing its plausibility in providing sound understanding of the integration of sustainability into business processes. This belief is based on feedback we have received from presentations of these results on a number of occasions in North America and Europe.

The model encompasses three levels: blocks, categories and sub-categories. The two broad and complementary blocks are *Institutional Context* and *Indicators in Perspective*. The first broad block identifies a group of institutional elements (categories) that promote and allow incorporation of sustainability into business strategy and management. The second broad block identifies a structure that integrates socio-environmental indicators with financial indicators, and categorizes them in a way that provides a

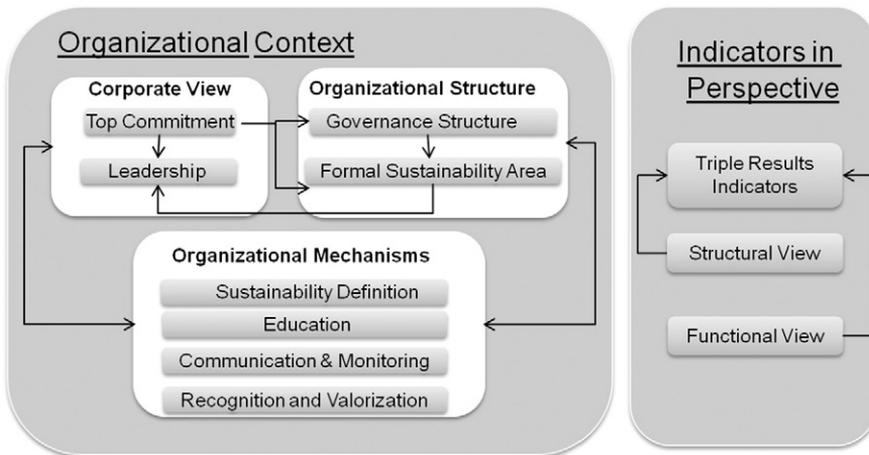


Fig. 2. Emergent theoretical model.

multidimensional perspective on organizational performance. The connection between these two broad blocks seeks alignment between information planning and the integration of sustainability into business practices.

The institutional context block consists of three categories: *corporate view*, *organizational structure* and *organizational mechanisms*. Each category is composed of sub-categories. For example, within the corporate view category we find top-level commitment and leadership. The arrows represent the propositions, that is, the relationships among categories and sub-categories. It is important to emphasize that we are dealing with a process-based model, not a variance-based one, i.e., the arrows do not indicate cause-effect relationships but logical connections among categories and sub-categories.⁵

The second block, *Indicators in Perspective*, rests on a multidimensional structure which seeks to allocate economic, social and environmental indicators considered at the same level of importance. Three views (core categories) of *Indicators in Perspective* emerged from our data analysis: *Triple Results*, *Structural* and *Functional*. The first view, *Triple Results*, corresponds to the well known concept of “triple bottom-line” (Elkington, 1998), and its purpose is to grant equal weight to economic, social and environmental indicators. The second view is called *Structural View*, and is represented by four macro-level dimensions used to assess business performance via indicators: business strategy, stakeholders, processes, and training and education. Although these four properties have emerged inductively from systematic data collection/analysis as prescribed by the grounded theory approach, they are comparable to the four dimensions set out in the balanced score card: finance, customers, process, and learning and growing. Finally, the third view, the *Functional View*, offers an analysis closely related to business operations and concrete business practices by function or area. The goal is to evaluate a company's performance based on indicators that measure actions developed in each of the company's areas or departments, following strategic guidelines.

Having presented the final model that emerged from a systematic application of grounded theory, we now return to the description of its construction. In addition to a detailed description of phases and steps, we outline the most important learned lessons in the form of suggestions and insights for future IS users of grounded theory.

3.1. Applying grounded theory – phases and steps

A work promoting a Straussian version of grounded theory that is widely referred to in both management and IS literature is that of Pandit (1996). Searching in databases such as ABI Inform, Emerald, Science Direct and JSTOR from 1996, we found 38 references to Pandit's work, some of them in IS journals (e.g., Matsumoto, 2005; Nasirin & Birks, 2003; Petrini & Pozzebon, 2009). As in the widely cited work of Eisenhardt (1989) on building theories from case studies, the appeal of Pandit's paper is the clear and systematized way he presents a step-by-step version of building grounded theories in detailed phases and activities that are close to Strauss and Corbin's (1990) work.

⁵ The identification of the emergent model as a process-based model was mainly influenced by the following assumptions proposed by Langley (1999: 692): (a) a process research is concerned with understanding how things evolve over time and why they evolve in this way; (b) process data consist largely of stories about what happened and who did what when – that is, events, activities, and choices ordered over time; (c) the analysis of process data requires a means of conceptualizing events and of detecting patterns among them; (d) patterns are sequences of “phases” that occur over time to produce a given result. We believe our process model fits with the above assumptions, as: (a) we tried to understand how things evolve over time in firms that excelled in terms of their sustainability practices; (b) our data analysis was based on stories about what happened in those firms, and what choices managers made to achieve certain results; (c) we conceptualized events and detected patterns among them; (d) those patterns gave rise to connections among categories, which have a logical sequence. Van de Ven (1992: 169) identifies three meanings of process: (a) a logic that explains a causal relationship between independent and dependent variables; (b) a category of concepts or variables that refers to actions of individuals or organizations and (c) a sequence of events that describes how things change over time (developmental model). Our process model could be identified with the last one, as it does not establish a necessary cause-effect relationship among concepts or variables, because one event does not necessarily provoke the next, but creates the conditions for the emergence of the next. For example, “top commitment” does not necessarily lead to changes in the “governance structure”, but it creates the conditions for changes in the governance structure towards finding a place for sustainability in the governance structure. The temporal relationship among our categories is not offered in a deterministic but, rather, a plausible way: one event provides the conditions for the possible emergence of the next. In sum, our process model proposes a developmental perspective, focusing on the sequence of events that unfold over the duration of a central subject. This process model was “developed inductively based on cross-sectional observations or retrospective histories in a variety of companies” (Van de Ven, 1992: 172).

Table 1 shows a version adapted from Pandit's (1996), which encompasses five phases: designing the research, collecting data, ordering data, analyzing data and comparing emergent theory with literature. Within these phases, nine steps are integrated, along with their related activities.

We call this version "adapted" due to one adjustment we propose to Pandit's version with regard to step 7 of the data analysis phase: theoretical sampling. Pandit (1996) suggests that selection of cases occurs as the data analysis evolves. For instance, researchers start with a first case, analyze the collected data in that case and, based on the nature of resultant categories and insights, select a second case, returning to step 2 and proceeding with a second iteration of data collection and analysis. All the subsequent cases will be selected in that manner, until theoretical saturation is reached. The adaptation we propose is to allow the researcher the possibility of returning to step 4 instead of step 2. The implication of this change is that researchers will select the cases to be included in the research design beforehand, using well-defined criteria and adhering to the research question under investigation. The theoretical sampling that follows will concern only the selection of new interviewees and new documents *within* the pre-selected cases, and not forcing the selection of new cases. The main premise of theoretical sampling is maintained, wherein researchers collect and analyze data dynamically and iteratively, deciding in the long run what additional data should be collected regarding themes and insights in emergence.

3.1.1. The research design phase

The *research design phase* consists of two steps: *review of literature* and *selection of cases*. Quite often we find claims in the literature that studies using grounded theory do not have a literature review section because the primary justification of using grounded theory is that the subject being investigated should be characterized by few, if any, published studies and that no theoretical models or related theory exist. Such a lack of existing theory would justify the choice of grounded theory and the absence of a literature review section, and would be more in line with Glaser's writings. A second current espouses a different position: even if there exist theoretical models of theories about a phenomenon of interest, the researcher has the choice of trying to produce a new theory or framework, or offering a different angle on or new interpretation of a phenomenon already investigated. This is more in line with Strauss and Corbin (1990) and their rationale of mobilizing reviews of literature as a source of theoretical sensitization. As outlined by Urquhart (2007), the preliminary literature review functions as an orientation, not as an attempt to define a framework.

We carried out a comprehensive review of literature (step 1), which allowed us to confirm that, in the IS field, research concern with sustainability was virtually absent in 2005–2006. Our preoccupation with

Table 1
Grounded theory phases and steps (adapted from Pandit, 1996).

| | | |
|------------------------------------|--|---|
| <i>Research design phase</i> | | |
| Step 1 | Reviewing literature | Definition, justification and refinement of the research question. |
| Step 2 | Selecting case(s) | Theoretical, not random, sampling. |
| <i>Data collection phase</i> | | |
| Step 3 | Developing a research protocol | Defining themes that delineate the boundaries of the research question; Building an initial guide for interviews. |
| Step 4 | Data collection | Flexible and opportunistic data collection. |
| <i>Data ordering phase</i> | | |
| Step 5 | Data ordering | Placing collected data in a chronological order. |
| <i>Data analysis phase</i> | | |
| Step 6 | Coding data | Use coding and memo concepts. |
| Step 7 | Theoretical sampling | Theoretical replication across cases; Return to step 2 or 4 (until theoretical saturation). |
| Step 8 | Reaching closure | Theoretical saturation when possible. |
| <i>Literature comparison phase</i> | | |
| Step 9 | Compare emergent theory with extant literature | Comparisons with conflicting and/or similar frameworks. |

the alignment of information planning – a crucial step in the development of information systems that support business practices – and with the integration of sustainability was echoed in accounting and general management literature, but absent from IS literature. Such an initial review helped us to justify our research object and to refine it in the form of a research question.

Suggestion 1: The review of literature, source of theoretical sensitization, should be carried out as a first step of a grounded theory method. The better researchers are informed about what has been already published regarding the subject under examination, the better they will be able to justify their analytical choices and support their arguments in providing an original contribution.

The second step of the research design phase is the case selection. Our cases were selected according to a set of criteria to assure the quality and relevance of the data collected. With this goal in mind, we established three criteria for selecting outstanding Brazilian firms in terms of their corporate sustainability agenda: (1) the company should be an advocate of or signatory to at least one of the various principles, norms, certifications or reports related to sustainability (for example, the widely known GRI or ISO 14001); (2) the company should be indexed by the Dow Jones Sustainability Index and/or the Bovespa Sustainable Business Index (Brazilian index similar to Dow Jones); (3) the company should have received awards or public recognition for actions related to sustainability. Based on those criteria, five large companies recognized as Brazilian leaders in sustainability practices were selected, denominated as FIN1, FIN2, FIN3, IND1 and COS1 (Table 2). FIN1, FIN2 and FIN3 are banks, and IND1 and COS1 are manufacturers of plastic pipe and cosmetics, respectively.

Suggestion 2: Researchers should adopt a non-random theoretical sampling procedure, identifying clear criteria – based on the research question – to guide and justify the case selection.

3.1.2. Data collection phase

The data collection phase consists of two steps: *developing a research protocol* and *entering the field*. Table 2 provides a summary of the interviews. In the first round, we conducted 16 interviews and in the second round five interviews, totaling 21 interviews. The interviewees were basically selected for their deep knowledge of the firms' sustainability processes and practices, including all phases: planning,

Table 2
Summary of data collection strategy.

| Firm | First round (March–August 2006) | | Second round (August–September 2006) | |
|-------|---|----------------|---|----------------|
| | Function of respondents | Duration | Function of respondents | Duration |
| FIN1 | (a) Business manager1 (b) Executive planning manager1 (c) Senior planning analyst | 1 ½ hours each | (a) Business manager1 (b) Business manager5 | 1 hour each |
| FIN2 | (a) Sustainability senior analyst (b) Sustainability executive manager (c) Business manager2 (d) Business manager3 | 2 hours each | (a) Sustainability senior analyst | 1 ½ hours |
| FIN3 | (a) Sustainability coordinator1 (b) Business manager4 (c) Support area manager | 1 ½ hours each | – | – |
| COS1 | (a) Sustainability coordinator2 | 4 ½ hours | (a) Executive planning manager2 (b) systems analyst3 | 1 ½ hours each |
| IND1 | (a) Quality control and environment director (b) Social communication director (c) IT manager (d) Systems analyst1 (e) Systems analyst2 | 2 hours each | – | – |
| Total | 16 interviews | 31 ½ hours | 5 interviews | 6 ½ hours |

operationalization and evaluation. All the interviews were recorded and incorporated into a database. All interviews were individual, and took place between March 2006 and September 2006.

Step 3 prescribes the development of a rigorous data collection protocol. A semi-structured interview protocol was developed to guide interaction with respondents, organized initially around broad themes such as organizational context (structure and culture), strategic planning, information planning, sustainability issues and accountability. As the research evolved, new themes – arising partially from data analysis and partially from researchers' insights, such as organizational leadership and corporate governance – were integrated into the protocol. It is important to recall that these broad themes do not correspond to any theoretical framework, which is precluded as a starting point by the grounded theory approach, but were defined in order to set the boundaries of the research question and to guide the work of the researcher in the field. In addition to interviews, documents like annual reports, social balance sheets, Web sites and media articles were important in closely assessing firms' contexts.

Suggestion 3: The development of a data collection protocol should be rigorous but should evolve in tandem with the data collection and analysis: the interview guide started with broader questions and became more specific as the conceptual model gradually emerged.

Step 4 focuses on the overlapping of data collection and analysis, which ensures that data are collected opportunistically and are analyzed iteratively. This overlapping allowed for adjustments to be made as creativity came into play and insights began to emerge, maintaining flexibility in data collection methods. In our field work, in the initial stages some of the emerging themes ended by decreasing in importance and disappearing, while others were gradually transformed into categories, undergoing further elaboration as the data collection and analysis evolved. Here is one of the several places where the combination of strong inductive logic with researchers' choices and imagination is clear.

Suggestion 4: Overlapping data collection and analysis improves researchers' ability to adjust their choices opportunistically and to open more occasions for creativity and imagination to come into play, once different paths of theory building can be extrapolated from the very same set of data.

Another consequence of overlapping data collection and analysis was a more purposive selection of new respondents. As the preliminary categories emerged, we could identify those requiring deeper understanding and we planned additional interviews with new respondents to address those categories as well as second interviews with previous respondents.

3.1.3. Data ordering phase

The *data ordering phase* has one unique step, of the same name. In step 5, data were organized in chronological sequence. For each case, in order to better understand the alignment of information planning with integration of sustainability into business processes, relevant events reported by the interviewees and in documents were chronologically ordered, starting from the time the firms first evinced concern with sustainability, and including changes with regard to the scope and monitoring of the social and environmental goals and indicators, the evolution in organizational structure and culture, etc. This chronological ordering process provided evidence of changes in nomenclature, as with *social* and *environmental responsibility* becoming *corporate social responsibility*, and then *sustainability*. It was also interesting to note, for example, that the first initiatives were directed more towards philanthropic projects, and that the commitment of the firm evolved to integrate sustainability in a more strategic way. We reached a better understanding of the history of the integration of sustainability in the five selected firms.

Here we make a connection between the data ordering phase and the production of our developmental process model, i.e., a model where a sequence of events or activities unfolds over time (Van de Ven, 1992). The chronological data analysis of five outstanding “green” firms facilitates the identification of the logical, temporal connections among the core categories. “Top commitment” to sustainability and the emergence of “leadership” create the conditions for changes in the “organizational structure” (mainly “governance” and the institutionalization of a “formal sustainability area”). These two blocks create the conditions for

putting in place a set of “organizational mechanisms”. Among those mechanisms, “monitoring” is linked to “information planning”, in other words, the alignment we were looking for.

Suggestion 5: Data ordering, a step often ignored in grounded theory papers, is a core step that allows researchers not only to deepen their comprehension of the context of their research subject but also to identify temporal connections among core categories, thereby favoring theorizing from the point when process data come into play.

3.1.4. Data analysis phase

The *data analysis phase* consists of three steps from applying various techniques of data analysis: *coding data*, *theoretical sampling* and *reaching closure*. From this point, a detailed codification of interviews and documents began. We mobilized the three types of coding – *open*, *axial* and *selective*. For each interview and each document selected, entire paragraphs were read and slices of them were coded according to concepts suggested by the data themselves. Background, experience, creativity and imagination started to play an important role. As noted by (Alvesson & Sköldbberg, 2000: 250): “the researcher's repertoire of interpretations limits the possibilities of making certain interpretations”.

During the *open coding process*, for each slice of data, we asked ourselves diverse questions related to the phenomenon being investigated – *what is this, what does this mean?* Formulation of these inquiries requires certain skills: ability to observe, curiosity and capacity to name and contextualize the answers that emerge. This use of open coding allowed us to begin identifying a large number of concepts, and these concepts that emerged from analysis were grouped into sub-categories. For instance, sub-categories like *leadership* and *top commitment* emerged very early as important sets of concepts. Then sub-categories gave rise to categories. This allowed us to clearly recognize the importance of researchers' experience and their capacity to deal with a variety of themes that often overlap. The refinement of sub-categories, the generation of new categories, the grouping of sub-categories within a more encompassing category, and selection of names (labels) were all mobilized by experience, but also by creativity and imagination.

Suggestion 6: Although creativity and imagination play a fundamental role in the open coding process, researchers should also mobilize their experience and background, particularly in the task we call “naming”: the search for the most meaningful concept, the one that best expresses the diversity of possible names emerging from each moment of data analysis.

During the process of *axial coding*, which is a subsequent phase of open coding, the identified categories and sub-categories are revisited for the purpose of finding relationships among them. As stated by Weick (2006), imagination is crucial in order to unify and give meaning to those “fragments”, and those fragments come mainly from previous experience. In order to provide a clear illustration of this, after several iterations in our analysis we identified a close relationship between *top commitment* and *leadership*, and grasped that these two sub-categories were related to something broader, a core category that we termed *corporate view*. We might suggest that the “discovery” of the relationship between those sub-categories – *top commitment* and *leadership* – was corroborated by the authors' extensive experience in management consulting and the functioning of their imagination in making plausible connections between emerging concepts. Could a junior researcher carrying out a grounded theory method produce similar insights from the very same data? That question is difficult to answer.

Suggestion 7: The combination of open and axial coding improves researchers' abilities to identify meaningful relationships among categories.

After all the data had been analyzed, a structure of categories, sub-categories and properties became increasingly stable, indicating that *theoretical saturation* was starting to be achieved. The data were then re-examined and re-coded, using the scheme of categories and properties that had been identified, in accordance with the *constant comparison* method. At this point, when the data were re-examined, new concepts emerged that did not fit into the preliminary and emergent scheme of categories and properties. This raised questions with regard to the model, leading to new interviews in some of the firms in an attempt to obtain a better understanding and to develop a consistent set of categories and their relationships. This

search for a better understanding of new questions arising during data analysis somehow represented a disruption in the building of a consistent conceptual model. This forced us to return to Step 4 in the data collection phase so as to select new respondents, with the possible eventuality of seeking selection of a new case (although this did not happen). These decisions are clear examples of the constant role of researchers' background and imagination in the process of theory building: as researchers look for new data, they have to imagine where the data most conducive to model improvement is. Researchers' choices act on the "emergence" of concepts, categories, relationships, and new questions leading to new concepts and categories or the judgment that saturation is being achieved. Researchers' knowledge of the context serves as a source of data to judge whether emergent concepts or new questions make sense or not. In our empirical work, we believe that the previous experience of both researchers with business intelligence systems and with sustainability had a strong influence on the choices they made using grounded theory techniques.

In sum, constant comparison, overlapping data collection and analysis, theoretical sampling and different types of coding are all procedures that lead to refining of the preliminary conceptual model (i.e., selective coding), where categories evolve and relationships among categories are enhanced by new confrontations of the emergent model with data already examined but now re-examined and re-coded, as well as by new collected data. We see that this persistence in re-examining and continually confronting emergent categories in the light of new data and new analysis is one of the bases of grounded theory. The interaction between data and concepts came to an end when our analyses led to the appearance of no further categories or sub-categories or questions with regard to those already existing, indicating that at this point we had achieved theoretical saturation. Again, however, this judgment that the conceptual model has achieved theoretical saturation depends on researchers' decisions.

Suggestion 8: Although the judgment that theoretical saturation was achieved is somewhat arbitrary, the systematic application of grounded theory's set of techniques (mainly theoretical sampling, overlapping coding modalities and analysis, and constant comparison) helps to discipline imagination and creativity, and to aid researchers in their decisions.

3.1.5. Literature comparison phase

In the last phase, step 9, we compared the model that emerged from the analysis phase with the result of the literature review previously carried out. We found some similarities and reinforcements that helped corroborate some of our categories and connections among the categories. For instance, some core categories like *corporate vision* and *organizational mechanisms* are corroborated by authors like [Carroll \(1979\)](#), [Wartick and Cochran \(1985\)](#) and [Wood \(1991\)](#) and quite often referred to as important "motivators" of corporate sustainability. However, these authors have not proposed *how* to organize these motivators as proposed in our model by the relationships among categories and properties, which can thereby be seen as an original contribution.

4. Discussion – grounded theorizing through "disciplined imagination"

The constant comparison technique was crucial for our learning process regarding how imagination is blended into inductive logic. First, we perceived the non-linearity of the numerous iterations between data and theory building, the richest phase involving researchers' insights. Although the concepts (the what) making up the model strongly emerged from the data, the connections among the concepts (the how) and the holistic view that explains the rationale of the model (the why) grew out of the imagination and background of the researcher trying to make sense of them. While grounded theory procedures are well defined for conducting the analysis with rigor and precision, they allow and stimulate the creativity required to lead to the emergence of a basic principle of theory building: data contextualization and sound interpretation.

Creativity and background support theoretical sensitivity, i.e., the capacity to make sense of data and to stimulate the formulation of questions, which is fundamental to the constant comparison procedure. At the one hand, researchers' creativity and choices create the window for challenging their own assumptions, for enriching their experience and for seeing beyond the data. At the other hand, researchers should be well-grounded in literature from personal and professional experience, in order to fully demonstrate

theoretical sensitivity (Purao, Rossi, & Bush, 2002). Theoretical sensitivity facilitates the recognition of the relevance of raw data to the theoretical understanding under construction (Strauss & Corbin, 1990). As expressed by Chakraborty et al. (2010), without theoretical sensitivity the researcher may end up focusing on description rather than on abstraction.

If we track the path of the identification of the “names” (labels, codes) of each concept (i.e., *top commitment*, *leadership*, *governance structure*) integrating the final model, they emerged from the data, but not “literally”. For instance, some interviewees talked about the leaders' vision, others about the engagement of the leaders, others about the top direction view, or the top-down view, and so on. The analysis of standards, commonalities, and convergences in the interviews' discourses stimulated the researchers' imagination in finding a comprehensive and significant term – *top commitment* – to express those common ideas emerging from the data in different forms. The “signification” of the term – *top commitment* – emerged closely, but not literally, from the data.

Our final model articulates two blocks and, in each block, three core categories. Why three rather than four, or two? Among the four sub-categories integrated within the core category *organizational mechanisms*, for example, three of them (*education*, *communication and monitoring*, and *recognition and valorization*) are directly related to the human resources area. Our final presentation of the model could have a single sub-category category – *people* – embedding these three sub-categories and the fourth sub-category – *definition of sustainability* – could be integrated within the core category *organizational structure*. The final structure does not emerge solely from the data analysis, but it is strongly influenced by the researcher's choices, and those choices are mobilized at different stages – during the interviews, during the coding, and particularly during the theorizing phase. Our choice of creating a core category called *organizational mechanisms*, grouping the four sub-categories, was triggered by the researchers' clear understanding that those concepts taken together are mechanisms that provide the business with a basis for integrating sustainability in its strategy. The sub-category *definition of sustainability* is not part of a structure but helps to set a common understanding for legitimating sustainability at the corporate level. The core category *organizational structure* is the road; the core category *organizational mechanisms* is the means of transportation that handles sustainability in day-to-day organizational life.

In short, imagination and creativity were revealed to be important in phases like structuring and naming categories. However, they were even more important in establishing propositions that indicate relationships among those categories. When we talk about the arrangement, the relationship of different categories – the formulation of different propositions – we claim that imagination and creativity played a stronger role. Analogously to Weick's (1989) seminal claims about theory construction, we conclude that grounded theory involves creativity and imagination disciplined by the processes of collecting, fractioning and coding, reassembling and connecting, representing and interpreting until the “emergence” of some provisional and plausible set of assertions, hopefully a theory, a conceptual model or just a framework.

5. Concluding remarks

In any type of empirical work, the researcher always faces difficult choices. In this article we have reported some of the choices we made in applying grounded theory. One of the significant choices we made concerned the adaptation of Pandit's (1996) step-by-step version of grounded theory. This adaptation was opportunistic, given the fact that, from the very beginning of our work, we could recognize outstanding firms that excel in sustainability practices in Brazil and from whom we believed we could learn about conditions facilitating or promoting the alignment of information planning and sustainability with organizational practices. Stake (2005) would term this an instrumental choice. Pandit (1996) did not recommend prior selection of cases, except for the first case. On the contrary, according to him, the selection of cases should occur as data collection and analysis evolved. We decided to make an adaptation of this criterion and we believe that the results are very positive, showing that the most important characteristic of grounded theory, and the one most worth preserving, lies in the systematic and iterative manner of overlapping data collection and analysis. In other words, grounded theory provides a well-structured frame, but allows space for some flexibility (Calloway and Knapp, 2005; Strauss & Corbin, 1990). Researchers should use this space in creative fashion in order to improve the relevance of the theoretical framework they develop.

One of the objectives of this article was to illustrate the potential of grounded theory as a research methodology for building models from the reality being investigated. The method allowed us to produce an original model emerging from the practices of Brazilian firms recognized for solid accomplishment in terms of sustainability. However, in line with the goal of most researchers, we believe the proposed model exhibits a precious attribute – plausibility – which increases its potential for external transferability. The experience of one of the authors in the North American business context suggests that the categories, properties and relationships proposed by the conceptual model are relevant not only to the Brazilian context but to firms located in other Occidental countries, in the Americas and Europe, which could also learn from it.

Development of theory is a sensemaking process. We bring into discussion the importance of the researcher's background and imagination in making choices, particularly when the logic guiding the empirical work is of a purely inductive nature. In our field work, creativity and imagination played a less important role in the generation of sub-categories and a more important role in the establishment of relationships among them and in the creation of categories of a higher level of abstraction: from sub-categories to categories and from categories to blocks. There is no guarantee that systematic and iterative use of techniques like constant comparison will allow the researcher to “discover” (produce) a new theory. From our point of view, theory building is always an interpretive exercise, where researchers' subjectivity, background, creativity and imagination, even if disciplined, have an important influence on the nature and content of the theory being built. Likewise, readers' subjectivity and background will also play a role in accepting and legitimating a proposed new theory.

Finally, this article seeks to provide evidence of the richness of combining induction, a bit of deduction and inspiration, as suggested by Langley (1999). Although mobilizing, in the first stages, an inductive logic for building the first draft of a new framework model, the grounded approach adopted here did not neglect existing literature, which is mobilized at two points: at the very beginning, to help better define the boundaries of the research question, and at the end of the data analysis, being integrated into the final step of constant comparison, in order to challenge and enrich the theoretical model being built. In addition, generous portions of inspiration are necessary in many situations of collection and analysis, where researchers decide which ideas will survive and which will be discarded in the explanation they are building, “discovering” from empirical data, but also from their experience, knowledge, preferences, creativity and, sometimes, even the lack thereof.

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