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## Interpretive Research Aiming at Theory Building: Adopting and Adapting the Case Study Design

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## Interpretive Research Aiming at Theory Building: Adopting and Adapting the Case Study Design

### Abstract

Although the advantages of case study design are widely recognised, its original positivist underlying assumptions may mislead interpretive researchers aiming at theory building. The paper discusses the limitations of the case study design for theory building and explains how grounded theory systemic process adds to the case study design. The author reflects upon his experience in conducting research on the articulation of both traditional social networks and new virtual networks in six rural communities in Peru, using both case study design and grounded theory in a combined fashion in order to discover an emergent theory.

### Keywords

Case Study, Interpretive Approach, Theory Building, and Grounded Theory

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# Interpretive Research Aiming at Theory Building: Adopting and Adapting the Case Study Design

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## Introduction

Researchers adopting a case study design face a number of challenges in making their argument. Yin (2003) himself warns researchers who adopt a case study design to be conscious that their findings will be challenged and prefaces his book enumerating the alleged weaknesses in the case study; a methodology that downgrades the academic disciplines and lacks sufficient precision, objectivity, and rigour. We should note that those warnings come from an author who operates from a positivist stance throughout his book.

If this warning applies to positivist researchers, then it applies even more so to interpretive researchers aiming at theory building through an inductive thinking process. Commonly, misunderstanding of the logic behind theoretical sampling as opposed to statistical sampling, and theoretical generalisation as opposed to statistical generalisation, can lead to unjustified criticisms of case study based papers. Simply adopting the criteria proposed to overcome the aforementioned criticisms of case study, construct validity, internal validity, external validity, and reliability (Yin, 2003) may not be appropriate under an interpretive approach. Interpretive researchers aiming at theory building need to adapt the case study guidelines. It is at this point that grounded theory (Glaser & Strauss, 1967), which over four decades has evolved from its positivist origins to an interpretive stance (Charmaz, 2006), intersects the case study design.

In this paper, I retrospectively discuss and analyse the challenges in creating a piece of research using both the case study design for the research plan and grounded theory, for data analysis and theory building, in the information systems field. This study, which is summarised at the end of this paper, analyses the mechanisms by which both face-to-face and virtual interactions are created or transformed in the presence of information and communication technology (ICT) tools in underserved rural communities in the northern Peruvian Andes. Case study design and grounded theory systemic process were used in a combined fashion for this research project.

## Theoretical Perspective

An interpretive approach provides a deep insight into “the complex world of lived experience from the point of view of those who live it” (Schwandt, 1994, p. 118). Interpretive research assumes that reality is socially constructed and the researcher becomes the vehicle by which this reality is revealed (Cavana, Delahaye, & Sekaran, 2001; Walsham, 1995a, 1995b). This approach is consistent with the construction of the social world characterised by interaction between the researcher and the participants (Mingers, 2001). The researcher’s interpretations play a key role in this kind of study bringing “such subjectivity to the fore, backed with quality arguments rather than statistical exactness” (Garcia & Quek, 1997, p. 459).

For the particular piece of work under study, I strived to attain an understandable and sincere account of the analysed phenomenon (Mingers, 2001). But at the same time, I admit that “no construction is or can be incontrovertibly right [and researchers] must rely on persuasiveness and utility rather than proof in arguing [their] position” (Guba & Lincoln, 1994, p. 108). In order to understand the social world under study and achieve a convincing explanation, I literally lived with the participants and shared their everyday life during fieldwork over a period of four and a half months.

Having explained the interpretive approach, it is necessary to add a word to make a distinction between qualitative research and an interpretive approach. They are not, by all means, equivalent and interchangeable terms (Klein & Myers, 1999; Neuman, 1997). Interpretive research assumes “that our knowledge of reality is gained only through social constructions such as language, consciousness, shared meanings, documents, tools, and other artifacts” (Klein & Myers, p. 69). Qualitative research is a broader term. In general, it refers to a study process that investigates a social human problem where the researcher conducts the study in a natural setting and builds a whole and complex representation by a rich description and explanation as well as a careful examination of informants’ words and views (Creswell, 1998; Miles & Huberman, 1994; Morgan & Smircich, 1980). As a consequence, “qualitative research may or may not be interpretive depending upon the philosophical assumptions of the researcher” (Klein & Myers, p. 69).

## Underlying Philosophical Assumptions

Researchers’ basic beliefs and worldviews lie behind their theoretical perspective. Guba and Lincoln (1994) talk about the need of researchers to make explicit both their ontological and epistemological assumptions before embarking on any research project. Answering the ontological question, “What is the form and nature of reality and, therefore, what is there that can be known about it” (Guba & Lincoln, p. 108) is the first step in the definition of how researchers can approach a research problem. The interpretive researcher’s ontological assumption is that social reality is locally and specifically constructed (Guba & Lincoln) “by humans through their action and interaction” (Orlikowski & Baroudi, 1991, p. 14). Neuman (1997) affirms that “social reality is based on people’s definition of it” (p. 69). From the previous assertions, it is apparent that interpretive researchers do not recognise the existence of an objective world. On the contrary, they see the world strongly bounded by particular time and specific context.

Therefore, the epistemological question, “What is the nature of the relationship between the knower or would-be knower and what can be known” (Guba & Lincoln, 1994, p. 108) must be answered in a consistent way with the ontological view. The interpretive researcher’s epistemological assumption is that “findings are literally created as the investigation proceeds” (Guba & Lincoln, p. 111). Moreover, they explicitly recognise that “understanding social reality requires understanding how practices and meanings are formed and informed by the

language and tacit norms shared by humans working towards some shared goal” (Orlikowski & Baroudi, 1991, p. 14).

Taking into consideration the previously explained philosophical assumptions, I identify myself as an interpretive researcher. Now we can move towards the central point of this paper, using the case study design in a combined fashion with grounded theory under an interpretive approach to theory building.

### **Case Study Design**

The case study is “an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin, 2003, p. 13). Since the case study design is conducted in a natural setting with the intention to comprehend the nature of current processes in a previously little-studied area (Benbasat, Goldstein, & Mead, 1987), it allows the researcher to grasp a holistic understanding of the phenomenon under investigation (Creswell, 1998; Eisenhardt, 1989).

Instead of seeking answers to questions such as “how much” or “how many,” case study design is useful for answering “how” and “why” questions (Benbasat et al., 1987; Yin, 2003). Orlikowski and Baroudi (1991) declare that, in the information systems research field, case study has demonstrated its appropriateness to generate a well-founded interpretive comprehension of human/technology interaction in the natural social setting. Consequently, from an interpretive perspective, the researcher can obtain sufficient material from the selected case(s) for subsequent analysis (Miles & Huberman, 1994).

Siggelkow’s (2007) discussion on persuasiveness provides a compelling argument for the appropriateness of the case study design, even from a single case, to contribute to a deep understanding of the phenomenon being studied. After recounting the case of Phineas Gage, a nineteenth century American railroad construction foreman who survived and continued living for 12 years with a large hole in his head and major destruction to his brain’s frontal lobes, after suffering an accident with an iron rod, Siggelkow argues that any criticism regarding the lack of representativeness and bias in choosing the sample should be rejected simply because of the value of such a rare incident to researchers, even for the most sceptical ones. Missing the opportunity to document, investigate, and explain this kind of phenomena might restrict our knowledge prospects.

Researchers, however, do not come across this kind of unique situation very often. Otherwise, we might be relieved of the burden of giving justification for conducting our research. However, it is not only a matter of justification. Researchers using case studies have the extra burden of convincing their readers of the legitimacy of and drawing conceptual implications from their findings.

### **Interpretive Case Studies**

It is recognised that case studies can follow either quantitative or qualitative approaches (Doolin, 1996; Stake, 1994) or any mix of both (Yin, 2003). Walsham (1995b) goes one step further and highlights the value of interpretive case studies. In qualitative and interpretive case studies the researcher is directly involved in the process of data collection and analysis (Creswell, 1998; Klein & Myers, 1999; Morgan & Smircich, 1980; Morse, 1994); however, in the latter, the researcher, through a close interaction with the actors, becomes a “passionate participant” (Guba & Lincoln, 1994, p. 115). Even though this aspect might be regarded as a pitfall, I contend that it is one of this approach’s advantages. It provides an opportunity to get a deep insight into the problem under study because “[a]n interpretive explanation documents the [participant’s] point of view and translates it into a form that is intelligible to readers”

(Neuman, 1997, p. 72). Indeed, interpretive research makes it possible to present the researcher's own constructions as well as those of all the participants (Guba & Lincoln, 1994; Neuman; Walsham, 1995a). This trait of interpretive case studies, however, puts an additional onus on the researcher, as the scenario described in the next paragraph illustrates.

Let's imagine a scenario at the beach in which a huge wave is approaching the shore. There is an excited surfer on top of the big wave and two scared children in a small inflatable boat right below the colossal wave. On the shore, a girl is admiring her boyfriend's dexterity and the petrified children's mother is watching the looming mass of water approaching the boat. On the adjacent cliff there is a relaxed monk meditating on the infiniteness of the universe, while enjoying the sea breeze and the sound of the sea. If we want to conduct research on what that wave means for beach-goers, our results will depend on who the respondent is. Interviewing one of the participants would give insights from that participant's perspective only, which may be insufficient, or even misleading, because their personal and intimate experiences with the wave are quite different from that of the others. If the interpretive researcher wants to create an integral and persuasive piece of research around this phenomenon, each participant's different perspectives should be included.

### **Case Study for Theory Building**

So far, the conditions that make conducting an interpretive case study a suitable option have been discussed. However, the issue of theory building has not been addressed yet. Eisenhardt (1989) and Eisenhardt and Graebner (2007), from a positivistic perspective, affirm the usefulness of the case study approach for building theory, which is expected to be strongly attached to empirical reality. This claim is also applicable for interpretive researchers; the resultant theory should emerge from the data. This inductive thinking process is more than simply generating hypotheses, of which the alleged "goal is not to conclude a study but to develop ideas for further study" (Yin, 2003, p. 120). This assertion hints that theory building is subordinated to theory testing. It is not.

Yet the case study design is suitable for assisting the researcher in the definition of the unit of analysis to be studied, the "bounded system... by time and place" (Creswell, 1998, p. 61). This is the main contribution of case study design. However, interpretive researchers aiming at theory building may find case study guidelines insufficient, not only because of its reduced length (no more than three pages including a one-page exhibit), but also for the lack of a detailed procedure, cf. Yin's (2003, p. 120) "explanation building." It is at this point that I propose to apply grounded theory as a systemic process conducive to theory building in a combined fashion with case study design. I emphasise the complementary nature of grounded theory and case study, while the latter assists the researcher in defining the boundaries of the study, unit of analysis, the former focuses on the existing processes from which theory will be ultimately constructed.

### **Grounded Theory**

Grounded theory, "the discovery of theory from data" (Glaser & Strauss, 1967, p. 1), provides the opportunity for the researcher to theorise from evidence existing in the data. Through the correct application of this systemic process, the researcher can produce either substantive theory, which is generated from within a specific area of enquiry (Urquhart, Lehmann, & Myers, 2006, p. 7) or formal theory, which is focused on conceptual entities (Strauss, 1987). Although one can blend into the other (Glaser, 1978), both substantive and formal theories are conclusive theories, they stand by themselves and are well grounded on the data.

The major advantage of grounded theory is its inductive, contextual, and process-based nature (Charmaz, 2006; Orlikowski, 1993; Strauss & Corbin, 1990). These characteristics prove to be particularly useful for interpretive researchers. It does not mean that grounded theory is an approach exclusively appropriate for interpretive researchers. Indeed, it is a neutral analytical process that fits well within either the positivist or interpretive approach (Charmaz, Urquhart & Fernández, 2006).

### **The Theory Building Exercise**

Researchers can take their previous knowledge into account, either from the existing literature or from their previous experience. It assists them in forming a theoretical basis for the approach to the issue to be studied (Eisenhardt, 1989; Walsham, 1995b). Although some researchers might erroneously assume that grounded theory implies going into the fieldwork without having reviewed the literature, it is a serious misunderstanding of the technique (Urquhart, 2001, 2007; Urquhart & Fernández, 2006; Urquhart et al., 2006). Siggelkow (2007, p. 21) explains that “our observations [are] guided and influenced by some initial hunches and frames of reference” and emphasises that “an open mind is good; an empty mind is not.” The literature review should not make the researchers simply impose previous theories when analysing the data instead of generating original categories; it informs the researchers’ ideas and helps them to produce a preliminary theoretical framework that should be regarded as a “sensitizing device” (Klein & Myers, 1999, p. 75), only which could be modified according to the actual findings; that might result in a serendipitous discovery.

Interpretive researchers should not lose theoretical sensitivity (Glaser, 1978). Strauss and Corbin (1990, p. 41) describe theoretical sensitivity as the “awareness of the subtleties of meaning of data” and elaborate that “one can come to a research situation with varying degrees of sensitivity depending upon previous reading and experience with or relevant to that area.” Ultimately, the researcher has to evaluate the relevance of their preliminary theoretical framework vis-à-vis the actual findings (Urquhart, 2001, 2007). Urquhart and Fernández (2006, p. 5) stress that the “preliminary literature review is conducted on the understanding that it is the generated theory that will determine the relevance of the literature,” which must be revisited and contrasted to the emergent theory from the data.

### **Integrating the Case Study Design and Grounded Theory**

Having described the foundation elements of both case study design and grounded theory, we now move forward to the central argument of this paper. Let us bring these two approaches together and explain how interpretive researchers aiming at theory building can exploit them, while avoiding the pitfalls that a rigid application of the case study might produce.

## Criteria for Interpretive Case Studies Aiming at Theory Building

Table 1

### *Criteria for Interpretive Case Study Aiming at Theory Building*

<b>Criterion</b>	<b>Definition</b>	<b>Specific case study tactic</b>	<b>Grounded theory principles</b>
Construct validity	Establishing correct operational measures for the concepts being studied	<ul style="list-style-type: none"> <li>• Use multiple sources of evidence</li> <li>• Establish chain of evidence</li> <li>• Have key informants review draft case study report</li> </ul>	<ul style="list-style-type: none"> <li>• Corroboration</li> <li>• Theoretical sufficiency</li> </ul>
Internal validity	Establishing causal relationship as distinguished from spurious relationships	<ul style="list-style-type: none"> <li>• Do pattern-matching</li> <li>• Do explanation-building</li> <li>• Address rival explanations</li> <li>• Use logic models</li> </ul>	<ul style="list-style-type: none"> <li>• Theoretical coding</li> </ul>
External validity	Establishing the domain to which a study's findings can be generalized	<ul style="list-style-type: none"> <li>• Use theory in single-case studies</li> <li>• Use replication logic in multiple-case studies</li> </ul>	<ul style="list-style-type: none"> <li>• Theoretical generalisation</li> </ul>
Reliability	Demonstrating that a study can be repeated with the same results	<ul style="list-style-type: none"> <li>• Use case study protocol</li> <li>• Develop case study database</li> </ul>	<ul style="list-style-type: none"> <li>• Chain of evidence as afforded by grounded theory method</li> </ul>

Case study methodology criteria (Yin, 2003, p. 34)

I argue that the four criteria and their specific tactics suggested by Yin (2003) to establish the quality of case studies, and to address the criticisms cast on case studies, are insufficient for interpretive researchers aiming at theory building. Grounded theory provides better tools for this purpose. The first three columns in Table 1 come from case study design (Yin); the fourth one summarises grounded theory principles.

As will be explained next, examination of the case study criteria reveals a strong positivist approach. The intention is not to criticise the positivist perspective nor by any means to rank the different philosophical stances. It suffices to say that grounded theory has evolved from a post-positivist stance to a constructivist/interpretive position (Anells, 1996; Charmaz, 2006; Mills, Bonner, & Francis, 2006; Urquhart, 2007). I contend that grounded theorists should carefully reflect on their ontological and epistemological assumptions before applying the case study design criteria and their specific tactics shown in Table 1. They can adapt or abandon them in their objective to develop theory from case study from an interpretive standpoint.

### **Construct Validity**

The case study design recognises the problematic nature of defining a correct “operational set of measures” (Yin, 2003, p. 35), but does not discard it at all. Instead, the case study design proposes using multiple sources of evidence in a triangulation fashion to contribute to addressing any potential problem: “data triangulation... essentially provide[s] multiple measures of the same phenomenon” (Yin, 2003, p. 99). As a replacement for the word triangulation, interpretive researchers should prefer, and feel more comfortable with, the term



corroboration, which denotes “the act of strengthening [an argument] by additional evidence” (Hayward & Sparkes, 1975, p. 253).

I strongly advocate for maintaining the chain of evidence, which is essential for achieving a persuasive account in theory building studies (Charmaz, 2006; Eisenhardt & Graebner, 2007; Strauss, 1987). Eventually, participants reviewing the report (member checking) might disagree with the researcher’s conclusions, but they ideally should not dispute the factual account presented by the researcher (Neuman, 1997; Yin, 2003). Furthermore, considering on the previous argument of operational measures, we cannot assume that even in the situation where all the participants agree with the researcher’s conclusions we have achieved construct validity. Participants’ agreement is not an indicator of the appropriateness of the operational measures: Theoretical; theoretical meaning is what confers construct validity (Straub, Boudreau, & Gefen, 2004).

Instead of construct validity as is defined by the case study design (Yin, 2003), “theoretical sufficiency” (Dey, 1999, p. 117) should allow interpretive researchers to build up and work upon constructs which emerge from the problem under investigation. I prefer to use the term “theoretical sufficiency” instead of “theoretical saturation” (Glaser & Strauss, 1967, p. 61). While both indicate that the data have been properly analysed, the latter turns out to be an inflexible expression because it “has connotations of completion [and] seems to imply that the process of generating categories (and their properties and relations) has been exhaustive” (Dey, pp. 116-117).

### **Internal Validity**

Pattern-matching, by which the researcher compares an observed pattern against a predicted one, is regarded as a valuable tactic for case study analysis, while explanation building is considered as a special type of pattern matching (Yin, 2003). However, as was explained earlier, in an attempt to achieve internal validity according to the precepts of the case study design, interpretive researchers may downgrade the essence of theory building. Once again, theory-building studies can produce conclusive theories and are useful not simply for the generation of hypotheses.

In addition, looking for rival explanations, other than the posed theoretical propositions, is a principle that is not exclusive for positivist researchers using the case study design. Searching alternative reasons for the occurrence of a phenomenon is a task that adds rigour to the piece of research. This is particularly true for interpretive researchers, who must keep an open mind when looking for any cause-effect relationship that can offer a plausible explanation of the phenomenon under study. This exercise adds to the credibility of the analysis and findings (Guba & Lincoln, 1994).

The coding procedure assists interpretive researchers in establishing the causal relationships that ultimately produce theory. Notwithstanding the major divergence between Glaser and Strauss on the correct application of grounded theory, Glaser (1978; 1992) defends the emergent nature of selective coding, while Strauss (1987) proposes doing axial coding under the coding paradigm (cf. Kendall, 1999), they both concur on one point: coding is an essential step in grounded theory. During the coding procedure the researcher advances “creating and assigning categories, continue[s] by exploring connections between them, and conclude[s] by focusing on an integrating core” (Dey, 1999, pp. 146-147). Indeed, interpretive researchers aiming at theory building strive to detect the existence of conceptual links among codes that generates theory, which in broad terms denotes “conjectures models, frameworks, or body of knowledge” (Gregor, 2006, p. 614).

## **External Validity**

External validity refers to the extent that the findings from a particular study are able to be generalised. However, the term should not be restricted to a statistical definition based on generalisations to the population from the sample. Lee and Baskerville (2003, p. 232) convincingly argue that generalising implies going “from particular instances to general notions.” Interpretive researchers should include the temporal and spatial dimensions of the phenomenon under study in their analysis in order to produce theoretical generalisations (Walsham, 1995a). These dimensions can yield important explanations of past data in particular contexts that could be useful to other settings in the future.

Interpretive researchers may or may not agree with the suggestion to test the emergent theory from one case to a second one and so on under the “replication logic” (Yin, 2003, p. 47). This approach returns us to a hypothesis-testing exercise, and although a correct approach from a positivistic perspective, it diverts the interpretive researchers aiming at theory building away from their main objective. Either from one case or from multiple cases, they intend to produce theoretical generalisations instead of testing theory.

## **Reliability**

Using a case study protocol and developing a case study database (Yin, 2003) assists in organising data during the research process. However, from an interpretive approach, the purpose in doing so is not to guarantee that a second researcher will arrive at exactly the same conclusions as the first one might have; the second researcher can use the same data and give a different interpretation based on her/his own beliefs and abilities to grasp the essence of the emotional context; i.e., “empathetic or appreciative accuracy” (Max Weber cited by Neuman, 1997, p. 72). Rather than presenting a completely different picture, the second researcher might discover a different angle to the problem at hand. Presenting the chain of evidence contributes to the trustworthiness of the analysis. Indeed, reliability for qualitative research “means producing results that can be trusted and establishing findings that are meaningful and interesting to the reader” (Trauth, 1997, p. 242) instead of showing consistent results by repeated analyses.

## **Applying the Case Study Design for Theory Building under the Interpretive Approach**

To illustrate how I adopted and adapted the case study design for theory building, I bring into play my doctoral research as an example. The research objective was to uncover the patterns of information and communication technology (ICT) use, and how it might be transforming the ways rural inhabitants interact with one another based on the ICT-mediated information now available in six communities in the Cajamarca region, in the northern Peruvian Andes, one of the poorest in the country. A group of non- governmental organisations and international donors sponsored a project that sought to provide information to local people in order to build capabilities for local development. For that purpose, computers connected to the Internet through satellite phones were installed at the local infocentros (the Spanish name for telecentres) in 2003. The installation of the infocentros in the communities of Chanta Alta, Huanico, La Encañada, Llacanora, Puruay Alto, and San Marcos gave me the opportunity to examine the dynamics generated by the ICT intervention within the social relationships among the local people.

I was an independent researcher: I had had no previous relationship either with the sponsors or with the local people. It was a web search on ICT initiatives in Peru that led me to the project. Soon after, its sponsors kindly agreed to give me access for conducting my research.

During the fieldwork, I spent approximately 10 days collecting data in each community. During the first few days, I simply observed everyday life, especially computer usage patterns; meanwhile, I established a rapport with the local people to reduce my level of unfamiliarity before them and gain access to my participants. Simultaneously, I maintained a degree of detachment that helped me to be conscious of things that local people generally took for granted. Even; even though I spent a long period with the participants, I always was an outside observer (Trauth, 1997; Walsham, 1995a).

Given that this study was in the “analytical borderlands,” the realm between the electronic space and users, where cultural values define the way of using computers (Sassen, 2004), I adopted an interpretive case study approach. This approach is appropriate for generating a well-founded comprehension of the complex interaction between humans and computers within their social settings (Ciborra, 2004; Myers, 1997; Orlikowski & Baroudi, 1991; Walsham, 1995a, 1995b).

### **The Unit of Analysis and Theoretical Sampling**

The case study design helped me in defining the time and spatial boundaries of the research. Since case studies are precise and delimited instances of a phenomenon selected for scrutiny (Schwandt, 2001), the first step was to define the unit of analysis. Each community was considered as a single sub-unit of analysis under a holistic multiple-case study design (Yin, 2003).

The holistic multiple-case study design does not mean that I adopted the replication logic, neither literal, for predicting similar results, nor theoretical, for predicting contrasting results as is suggested by Yin (2003). I was not testing any hypothesis or theoretical framework. The proposed multiple-case study design, nevertheless, contributed to a deeper understanding and explanation of the research problem at hand.

I was looking for the major themes that could assist me in disentangling the complex problem and shed light over its hidden dimensions. After obtaining the ethics approval from the University of Auckland (New Zealand), I initiated the fieldwork in July 2005, which continued until November 2005 in Peru. It is worth mentioning that unforeseen circumstances during the fieldwork required me to change my planned itinerary and sequence for the data collection. Indeed, a self-imposed condition for this fieldwork was to be open enough to follow the data wherever they could be in terms of both participants' geographical location and data availability; in other words, being flexible and adaptive (Eisenhardt, 1989; Trauth, 1997; Yin, 2003).

Although identifying participants for this research imposed some challenges, finding the individuals to be included in the research in small communities such as those where the fieldwork took place was not an insurmountable task. The fact that I am a Peruvian made things much easier. When I negotiated the access to the project with its sponsors, they gave me the names of the people in charge of the infocentros. They were my first points of contact in each community and acted as key informants who, through a snowball sampling, put me in touch with computer enthusiasts. My everyday interaction with local people allowed me to identify other participants.

The notion of theoretical sampling was put in practice during the fieldwork. It implies “being flexible to determine... individuals to be included in the research, those which provide appropriate comparable data [and might prove valuable] for generating categories” (Dey, 1999, p. 5). Morse (1994, p. 228) defines the good participant as the “one who has the knowledge and experience the researcher requires, has the ability to reflect, is articulate, has the time to be interviewed, and is willing to participate in the study.” It has to be said that evaluating the significance of participants' insights for the research problem could only be assessed after the

data was collected: I came across a few instances where the participants did not provide me with enough material to analyse.

### **Corroboration and the Chain of Evidence**

In this research, I used both primary and secondary sources of data. Focused in-depth interviews, field notes, and photographs are among the primary sources of data, while the secondary sources of data entailed ICT media content as well as published information material.

The focused in-depth interviews assisted me in uncovering understandings, meanings, stories and experiences, and feelings and motivations (Collis & Hussey, 2003; Tacchi, Slater, & Hearn, 2003; Walsham, 1995a; Yin, 2003) around the problem at hand. Thirty-eight in-depth interviews were conducted in Spanish, the mother tongue of both the researcher and the participants, which were, audio-taped and transcribed. Eight of the interviews were with the project sponsors and the remaining 30 with the intended beneficiaries of the project. The field notes (more than 200 pages of hand-written annotations), which were written on a daily basis during the fieldwork, contain detailed descriptions and explanations of the observed phenomenon during the fieldwork. The field notes proved to be useful, especially when the participants were monosyllabic in their answers. To some extent, the field notes reflected some analysis because they contained not only factual accounts, but also my interpretations of the observed phenomenon and somewhat “overlap data analysis with data collection” (Eisenhardt, 1989, p. 539). The purpose of the photographs was to provide graphical and vivid testimony of the context where the research was carried out and support my annotations (Cook, 2005). The over 100 photographs were demonstrated to be particularly useful during the analysis process. They provide substantiations of the events I observed, and through a reflective process helped me to elicit explanations of the social context.

Among the secondary sources of data, I analysed ICT media content (i.e., the local radio broadcasting stations, and the project website), and published information (demographic data, maps, and project reports). The former allowed me to understand what kind of information the project was offering; the latter gave me background information on which the research was taking place.

Every new accumulated source of evidence was recorded, organised, and carefully analysed. They helped me to corroborate my findings. The case study database was produced using NVivo® software package. The intention of producing the case study database was not to achieve reliability in positivist terms; it was to document the data in order to maintain the chain of evidence, at the end of the day data constitute the first link of the chain.

### **Theoretical Coding, Theoretical Sufficiency, and Theoretical Generalisation**

Having collected the data, the inductive thinking exercise started with theoretical coding, which involves initial codes, focused codes, categories, and themes, until theoretical sufficiency has been achieved, which led to theoretical generalisations. It must be noted that the end result of grounded theory is not just to code the collected data; it is to produce theory. Similarly, this theory must emerge from data, and not from any preconceived hypothesis along a conceptualisation progression.

Having a holistic-multiple case study in hand, I decided to initiate the coding procedure on a case-by-case approach by being mentally immersed in each community when examining the data. I went from descriptive codes with little interpretation towards pattern codes at a higher level of abstraction with more inference power, in order to differentiate and combine the gathered data. It must be noted, however, that codes assigned at one moment of the analysis

were not immovable, since they could be changed along the analysis process in order to attain refinement (Miles & Huberman, 1994; Urquhart, 2001). Alongside the coding procedure, analytic memos became useful in order to build theoretical ideas around the identified codes (Charmaz, 2006; Dey, 1999; Glaser, 1978, 1992; Strauss, 1987; Strauss & Corbin, 1990; Urquhart, 2001). Appendix A shows an example of the analytical memos produced together with the coding procedure. Asking the questions suggested by Glaser (1978; 1992) and Strauss (1987) helped me to make the codes emerge. First I asked, “What is this data a study of” in order to be aware of the possibility of an alternative subject from the one I thought I was going to study, I let the data speak for themselves. Second, I asked, “What category or property of a category does this incident [piece of data] indicate” in order to find the connection between the data and the emergent codes as well as the connection among the emergent codes, I was looking for the conceptual links within the massive amount of non-structured data. Finally, I asked, “What is actually happening in the data” in order to find the discovery path of the core theme, I was trying to understand the underlying meaning in order to find an explanation to the research problem.

For the initial coding, I broke “the data analytically” (Strauss, 1987; Strauss & Corbin, 1990) and ran “the data open” (Glaser, 1978, 1992), while seeing “actions in each segment of data” (Charmaz, 2006). I adopted the criterion to identify codes when complete ideas or concepts within the data emerged. The process of constant comparison of instances of data was an iterative one that involved going back to the transcripts very often to assure the participants’ views were allocated to the appropriate codes. At the end of this stage, 165 initial codes were produced (see the Appendix B).

Once the initial coding was completed, I moved to the focused codes, which emerged from the most significant initial codes (Charmaz, 2006). I put the already fractured data back together in order to delimit the focus of analysis around some significant variables that lead to a parsimonious model (Glaser, 1978, 1992; Strauss, 1987; Strauss & Corbin, 1990). I always made comparisons, asked constantly, built on ideas, and looked for fresh possibilities (Charmaz, 2006; Glaser, 1978) to refine the emergent focused codes. Eventually, 16 focused codes emerged (see Appendix B). During the bottom-up coding technique, I brought my previous knowledge, experiences and associated ideas to be theoretically sensible (Glaser, 1978).

Then, I identified the salient focused codes “in terms of how well-founded they are in prior experience [and at the same time recognising] the value of holistic understandings” (Dey, 1999, p. 147). I continued applying the concept-indicator model (Glaser, 1978) by comparing the codes to each other, looking for similarities and differences among them in order to discover the emergent categories, the boundaries of which were frequently fuzzy. As a result, five categories have been identified (see Appendix B).

I stopped coding and categorising data when I attained theoretical sufficiency. At that point, two core themes, which represent the underlying meaning or patterns found in the categories (Charmaz, 2006), emerged (see Appendix B). The two core themes allowed me to reflect upon and explain the problem at hand, and produce the theoretical generalisations. The theory that I have produced was a theory for analysing “the what is” and a theory for explaining “the how is” (Gregor, 2006), the interaction between the ICT intervention and the existing social fabric in the six rural communities. The findings themselves are beyond the scope of this article’s objective and would distract the reader from the central argument of this paper (interested readers may refer to Díaz Andrade & Urquhart, 2009).

## **Conclusion**

This is a paper on how to build theory from an interpretive research approach through adopting and adapting a case study design. Likewise, this paper contributes to recognising both the advantages and limitations of case study design for interpretive researchers aiming at theory building. Although the case study design helps in defining the line of action and delineating the boundaries of the research, it does not provide enough guidelines to produce theory. Grounded theory is a rigorous systemic process for theory building that expands on “explanation building” (Yin, 2003, p. 120). Case study design and grounded theory complement each other and can be used in a combined fashion by interpretive researchers aiming at theory building.

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## Appendix A

### Example of an Analytical Memo

<b>Analytical Memo Summary</b>
<ul style="list-style-type: none"> <li>- Education is perceived as a springboard for empowering people and providing better opportunities in life; family plays a crucial role in children's education achievements.</li> <li>- Except for some outstanding exceptions, a poor reading level prevails.</li> <li>- Computer literates, and those who foresee computers' potential, regard computers as valuable personal assets because they open new opportunities.</li> <li>- It is a relatively small environment where everybody knows everybody.</li> <li>- Individuals who have been exposed to other environments try to emulate the experiences they learned.</li> <li>- Creativity, innovativeness and entrepreneurship are salient characteristics of the most resolute villagers; they become natural leaders.</li> <li>- There are change-agents, mostly the most respected who are those exposed to other environments and act as leaders, that counteract the resistance to change.</li> <li>- People enjoy face-to-face interactions.</li> <li>- Rules of reciprocity are institutionalised.</li> <li>- There are recognised information brokers, who perceive their role as a contribution to the community.</li> <li>- Some individuals are keen on engaging in a virtual interaction through computers, both with acquaintances and 'new' mates if any advantage is perceived.</li> <li>- Computers are used for problem solving: from completing school assignments to getting information about farming and stockbreeding techniques.</li> <li>- People recognise the computers' advantage for storing and organising documents.</li> <li>- The infocentro manager tries to legitimate it by involving communal leaders from surrounding hamlets.</li> <li>- Infocentro sustainability is a major concern.</li> </ul>

## Appendix B

### Inductive Thinking Procedure

#### Theme 1: Individuals' exploitation of ICT

<b>Initial codes</b>	<b>Focused codes</b>	<b>Categories</b>
Less valued for women, long-term relevance of education, family education expectations, non-relevance of education, comparing quality of education, education commitment, teacher apathy, education for empowering, uncertainty of achieving educational goals, limited opportunities for uneducated persons, illiteracy in the countryside, difference between formal education and intrinsic abilities	Views on education	Individual capacities
School-based reading, general reading, specialized reading, functional illiteracy, non take up of reading, religious reading	Reading habits	
Computer enthusiasm, formal training, informal training, computer relegation, novelty value, lack of training program, compulsory training, apprehension to newness, awareness of computers, generational attitudes towards computers, computer as a tool for progress, sponsored courses, computer ownership	Learning computers	
Being well-known, standing out for computer abilities, being respected, influential families, respected figure opposed to computers, political connections	Recognisable characters	Individual attitudes
Representative role, organizing activities, guiding role, setting goals, natural leader, official delegate, distant representation, influential organization	Communal leadership	
Personal purposes, acting as a delegate, professional purposes, business purposes, educated elsewhere, extreme isolation, travel risks, social links everywhere, educational trip, engagement in faraway organizations, provincialism	Urban exposure	
Bringing initiatives, looking for better opportunities, can-do attitude, innovation, fatalism, feeling of inferiority, culture of dependence	Degree of initiative	
Some experimentation, not perceiving the benefits, acting as change agents, rural values, open-mindedness, computers for agriculture, misunderstanding of computers, different priorities in rural environments	Acceptance of modernity	

## Theme 2: Complementing existing social networks through ICT

<b>Initial codes</b>	<b>Focused codes</b>	<b>Categories</b>
Benefit from relations, family support, face-to-face interaction, market as a meeting point, business network, long-lasting contacts, limited network	Customary interaction	Communal life
Accepted institutions, reciprocity, being part of the community, trusting each other, urban-rural divide, centralized government, defunct institution, voluntary communal organizations, community pride, charitable work, political organization, collective protection, non-confidence in formal authorities, institutionalized apathy	Communal commitment	
Informal channels, formal channels, generational attitude towards information, radio broadcasting, information brokering, reliance on external sources, billboards, need of specific information, actively seeking information, written transmission, need to cater for peasants, performances conveying information	Sharing information	
Expanding the network of contacts, e-mail for communication, preserving existing contacts, everyday communications, chat for communication, professional communications, problem-solving communications, cheaper option for communication, business communications, infocentros managers' interaction, job opportunities, bringing people closer, learning from each other, quick communication, communication tool, pastime, academic communications	Virtual networking	Using Computers
Complementing traditional sources, Internet as an unlimited source of information, keeping informed, getting specialized information, assessing information appropriateness, using computers for progress, information for empowering, information value, information for education, quick access, free information	Seeking information	
Neat presentation, easy production, a new tool for paper-based communications, personal diary	Preparing documents	
Information supplier, training centre, phone communication, public communication tool, appreciated by young people, intrinsic value, leisure space, infocentro as time and money saver, gradual recognition, venue for workshops, symbol of progress, communication centre, prompting interest in computers	Contribution	Perceptions of the infocentro
Slow connection speed, personal grudges, restricted utility, misallocation of the infocentro's equipment, poor service, unaffordable fee, volunteer staffing, lack of privacy, sustainability concerns, lack of sponsorship, use of the computer by an elite group, non take up of the infocentro, undifferentiated from cabinas públicas, unfulfilled promise, unknown purpose, unheard voices	Disenchantment	

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