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Antonio Diaz Andrade

Auckland University of Technology, antonio.diaz@aut.ac.nz

Tiru Arthanari

The University of Auckland, t.arthanari@auckland.ac.nz

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AN UNORTHODOX INTERPRETIVE APPROACH IN INFORMATION SYSTEMS RESEARCH: A PICTURE IS WORTH 1000 WORDS

Completed Research Paper

Antonio Díaz Andrade
Auckland University of Technology
Private Bag 92006
Auckland, New Zealand
antonio.diaz@aut.ac.nz

Tiru Arthanari
The University of Auckland
Private Bag 92019
Auckland, New Zealand
t.arthanari@auckland.ac.nz

Abstract

In this paper we make the case of using photographs as a source of data for interpretive research in the information systems field, especially for ethnographic accounts. We treat photographs as knowledge objects and examine the richness of content and context they offer. Based on experiences from anthropology and sociology, we contend that photographs should be used along with other sources of data, not only during the analysis stage but also be included in the conventional written report. We analyze the researcher's role along three moments of research: during the fieldwork as an image maker, during the analysis stage as an image analyzer and during the writing up as an image presenter. A study on the transmission of information and use of computers in rural communities in Peru is used to explain the use of photographs along these moments of research.

Keywords: Epistemology, interpretive research, ethnography, visual data, photographs

Introduction

An examination of the articles published in the information systems field indicates that most of them include illustrations as part of the written report. For instance, Gregor (2006) presents a figure portraying the interrelationship among five types of information systems theories; Finnegan, Galliers et al. (2003) depict an inter-organizational network configuration schema in their study on business-to-business electronic commerce; Leonardi and Bailey (2008) portray a diagram to show the flow of information in distributed work; Oh and Lucas (2006) show a frequency distribution chart of price changes of computer components sold online; and Dyson (2004) presents print-screens of both a single-column text and a three-column text in her comparative analysis of how different layouts affect reading from screen. The use of photographs, however, seems not to be a common practice in information systems; we have found only a few exceptions. One of them is Miscione's (2007) inclusion of a satellite photograph of a dark world map – "Earth at Night" (p. 404) – to show the existing digital divide between the developed and the developing worlds in a metaphorical introduction to his study of the interplay between telemedicine and traditional medicine in Peru's Amazonian region. Another one comes from Puri's (2007) research on a land management system for the drought-prone district of Anantapur in India; he inserts two photographs: one of them portrays the participatory mapping in progress (p. 368) and the other one depicts the outline of the resource map (p. 369). Similarly, Salvador, Sherry et al. (2005) present a collection of photographs of Internet cafés in Brazil, Ecuador, Peru, South Korea, Spain and the United States. In an action research study on groupware technology adoption in a virtual learning team in a Danish master program, Bjørn, Scupola et al. (2006) use photographs to bring out the nature of interaction with the participants at the different stages.

The landscape described in the previous paragraph reveals that photographs have not been used as a source of data to be analyzed; their use has been limited to illustrations accompanying the text. Paradoxically, the story seems to be somewhat different as regards video recordings. Although they cannot be inserted in the printed text, video recordings offer the opportunity to conduct an in-depth micro-analysis of the interaction between humans and computers in their physical environment (Ruhleder and Jordan 1997; Suchman and Trigg 1991). For instance, an analysis of video recordings of the use of certain computer applications in the workplace made apparent the need for them to be redesigned and customized (Bødker 1995). Hardless, Lindgren et al. (2007) took a different approach; they used video as part of a virtual role-play scenario rather than an element to be analyzed in their design theory process for a technology-mediated learning system in a Swedish project-based organization. We contend that photographs offer as much valuable information as video recordings – or any other piece of collected data – that deserve to be rigorously analyzed. Furthermore, photographs can be inserted in a printed report and help the researcher show the chain of evidence.

Unlike anthropology and sociology, which have developed their own areas of specialization around visual methods (cf. Collier and Collier 1986) – these disciplines even have dedicated journals like *Visual Anthropology*, *Studies in the Anthropology of Visual Communication* and *Visual Sociology* (now *Visual Studies*), among others – research in information systems has taken an almost exclusively word-driven approach. The use of photographs, however, in other areas of business research is gaining momentum. In the management field, Guthey and Jackson (2005) have analyzed the symbolic nature of large corporations' CEO portraits (e.g., Nestlé and Microsoft) and how they are intended to project the authentic presence corporations lack. In tourism studies, Naoi, Airey et al. (2007) have used photographs as stimuli to elicit participants' responses on the features of the historical town of Sanmachi (Japan) in order to understand how visitors evaluate tourist destinations. From the marketing camp, Brace-Govan (2007) discusses the issues raised when participants generate images and provides guidelines for the analysis of those participant-generated images.

We attempt to make the case of the usefulness of photographs in the research process in information systems. To support our argument we explain how photographs were utilized in the different stages of the research process conducted on the use of computers and information transmission in rural communities in a developing country. We divided our work into three moments: fieldwork, analysis and writing up. During the fieldwork, photographs were used for registering the evidence of the phenomenon under study and its context; during the analysis, for eliciting ideas and, during the writing up, for supporting the researcher's descriptions and interpretations. Even though in this paper we highlight the usefulness of visual data, we are far from claiming the need to conduct purely visual research.

Our argument is positioned within the interpretive epistemological paradigm and takes a qualitative approach for the data collection and analysis (Guba and Lincoln 1994). After many years of being dominated by the positivist paradigm, the interpretive research paradigm in the information systems field has become widely accepted after

Orlikowski's (1993) and Lee's (1994) precursor works. Later on, explicit calls and guidelines on how to conduct interpretive research were made (Klein and Myers 1999; Lee and Baskerville 2003; Walsham 1995a; b). We aim at highlighting the potential contribution visual data can make within the interpretive paradigm in information systems research.

This paper is organized into six sections. Following this introduction, after discussing the meaning of photographs in research and the way they have been used in other academic disciplines, the second section introduces the three-moment model we use to make the case for the use of photographs in information systems research. The third section analyzes the first moment: the researcher as image-maker during the fieldwork. The fourth section elaborates on the second moment: the researcher as image analyzer; that is, the interpretation of photographs. The fifth section offers guidelines for the third moment: the researcher as image presenter during the writing up. In the last section, we present the conclusions of this paper.

Words Are Not Enough

Logocentrism – the assumption that written language is the fundamental expression of external reality – pervades academic disciplines. In general, they are “disciplines of words” (Mead 1995, p. 4). Unsurprisingly, Miles and Huberman (1984), two eminent qualitative researchers, point out that qualitative data come in the form of words. Their assertion suggests a marked contrast with quantitative data that largely come in the form of numbers – which, following the convention, are eventually transformed into words. It seems that the prospect of having data in the form of images is not even considered suitable. This logocentric logic informs the approach of the researcher across disciplines and across epistemologies; a logic that Prosser (1998) names as “orthodox word-oriented research” – a label that inspired this paper's title. We maintain that the use of the researcher's own eyes should not be shunned (Silverman and Marvasti 2008) because data also come in the form of images.

We live in a pictorial world of images, where cultural symbols, social interactions and individual actions can be perceived through our vision; certainly, culture can be seen as “an integrated series of symbolic systems” (Ruby 2006, p. 71). We are surrounded by images, and most of our understanding of the world is made through what we have seen. Similarly, researchers get a fair amount of information about the phenomenon under study through their visual sense (Pole 2004); the richness of this sighted content indicates the availability of visual material (Ball 1998). Moreover, during the analytical process researchers evoke images of what they have seen – even if neither a video recorder device nor a photographic camera was used when in the field. Then, during the daunting phase of writing up a report, they bring to mind the same images and translate them into words; it being up to the researcher to include the photographs in their final report. When presenting their results the researcher stands between his/her audience and the phenomenon under investigation, conventionally using texts. However these texts, prepared by the researcher, cause the audience to produce their own mental images. It is a situation where the researcher, through his/her narrative, transports the reader to the field.

Writing a postcard from one of our visited destinations during a pleasant trip, preparing a business report presenting the results for the last quarter, or authoring a manuscript such as this are instances whereby words are put together in order to represent a mental picture. The ultimate goal of such examples is to convey a message to someone who has not had first-hand access to the information that is being transmitted. It brings us to reflect on the researcher's inventiveness when presenting their findings. Every account of the facts of life – e.g., demographic data, transcribed interviews and surveys, among others – involves some invention from the researcher. It is the researcher's intention, skill and integrity that can make these inventions “move an account closer to or farther away from things as they are” (Morris 1999, p. 34).

These pieces of information can be transmitted not only by written words but also by images. In particular, photographs should prove to be especially useful when the researcher takes an ethnographic approach during their fieldwork since they turn out to be visual texts (Pink 2007).

Fieldwork, Ethnography and Images

The practice of conducting fieldwork has its origins in the discipline of anthropology and goes back to Alfred C. Haddon's two expeditions to Torres Island (Australia) back in 1888 and 1898. Before him, it was possible to document and analyze a cultural phenomenon just from someone else's account, mostly explorers and traders, without even visiting the research site – a case in point is Sir James G. Frazer (1854-1941), who never traveled

beyond the European continent, yet produced seminal work on myth and religion mainly from ancient texts and questionnaires he posted to missionaries and officials commissioned all over the British Empire. Haddon's intention to conduct an in situ anthropological study was inspired by the then predominant naturalistic research and positivistic approach. Since then, fieldwork became an inherent component of ethnographic research. The convention today is that the researcher conducts the fieldwork by himself/herself.

Some years later, Bronislaw K. Malinowski, the originator of participant observation, conducted research in the Trobriand Islands (Papua New Guinea) in 1914, which granted full *scientific* credentials to ethnography in terms of both data collection technique and research product. At the core of ethnographic research is the close and prolonged interaction between the researcher and the participants, which allows the former to produce a thorough description and deep interpretation of a social group, bringing into play both the researcher's etic and the actors' emic (Crotty 1998). Nowadays, ethnography – and its fieldwork component – is a widely accepted method for qualitative researchers in different social disciplines; in the information systems field, ethnography has been recognized for the deep understanding of the particular problem under study it affords (Myers 1999).

During the last few years many information systems studies have been informed by an ethnographic approach and involved the researcher conducting the fieldwork. We will just mention a few examples here: McBride's (2008) study of the cultural issues in the development of software quality procedures by making explicit the researcher's experience (autoethnography); Bergman, Lyytinen et al.'s (2007) ethnographic fieldwork to understand the ecology of systems development and design in an aerospace organization; Schultze's (2000) ethnographic analysis of the production of informational objects as part of a knowledge management technology; and Myers and Young's (1997) ethnography to discover the "colonizing tendencies" embedded in the development of a mental health information system.

We would like now to go back to the initial stages of fieldwork and ethnography, which will assist us to highlight the central argument of this paper. Haddon and Malinowski were not only precursors in the practice of fieldwork and ethnography; they pioneered the collection and use of visual data. The former produced a film (of his second expedition), while the latter generated a large number of photographs. Their intention, perhaps influenced by the positivistic approach, was to gather objective data that would allow them to present in due course incontrovertible evidence supporting their findings. They might have been attempting to achieve authenticity by what Sekula (1975, cited by Ball and Smith 2006) called "the myth of photographic truth" (p. 14).

The Meaning of Photographs

While photographs, especially the documentary ones, may provide a precise record and confer authenticity, our perspective on the use of photographs is different from Haddon's and Malinowski's intention to include images as an output of their researches – the purpose of their images was to present objective records produced during their fieldwork. We do not plan to use photographs to present evidence informed by a positivistic paradigm; we are well positioned in the interpretivist realm. Paradoxically, photographs show dual qualities since not only do they represent a tangible record of a specific situation in space and time of the world itself but also a construction of the world as seen by the image maker (Harper 2006b). Despite the fact that an image represents a material object, a photograph cannot represent a social reality; at the best, we can only observe some material traits of the existing social life through visual accounts, but not the intangible elements of social life. Indeed, visibility and reality are not synonyms; what is visible represents reality, but the whole reality cannot be represented in an image (Pink 2007). Photographs are only proxy representations of reality (Banks 1995); they can only selectively and partially capture reality, which nonetheless needs to be interpreted and put into context to make it understandable – cf. Pink's (2007) "ethnographicness of photography" (p. 66).

Although visual material does contribute to our understanding of the social world (Latour 1986), photographs are subject not only to the viewer's interpretation but also to the photographer's intention when producing them and the photographer's representation of reality (Goldstein 2007). Indeed, assuming that social reality is recordable is a problematic oversimplification, since the photographer selects the instances to be captured; photographs are "the result of an arbitrary selection" (Bourdieu 1990, p. 73) representing "discrete slices of time" (Harper 2006b, p. 88) that are no more than a collection of "systematic exclusions" (Pink 2007, p. 10) of the real world. In summary, photographs are just incomplete representations of reality (Stanczak 2007). A photograph, while having the capability of capturing a concrete instance, also makes it difficult to understand the abstract (Harper 2006a). Thus, graphic records of the field should be treated equally as any other piece of information collected – e.g., interview

transcripts, surveys, field notes, etc. They all assist the researcher in eliciting ideas during the interpretation of data and might be used to present snippets of what have been found in the field in order to make it easier to convey the message to the audience.

It may be argued that the ultimate interpretation of the photographs is up to the viewer; the same set of images can render different interpretations depending on the viewers' system of values. For instance, Pink (2007) explains how the images she produced as part of her research on the bullfighting culture in Spain received radically conflicting interpretations from two strongly opposed groups: the bullfight enthusiasts and the animal rights advocates. This may be the case if the researcher just presents a set of images without any explanation at all, which is not the approach we are supporting in this paper. We assert that the researcher can still influence the viewer's interpretation by providing a textual explanation of the content and context of the images (Goldstein 2007) which we develop further later on.

The Researcher Producing, Analyzing and Presenting Photographs

From an epistemological point of view, Harper (2006b) classifies the use of visual material in ethnographic research into four major categories. The first one, *scientific*, assumes that photographs are objective records of a specific instance in time and space. The second one, *reflexive*, prompts the participant's interpretation from photographs taken by the researcher. The third typology, *phenomenological*, explores the most subjective aspects of research and invites the viewer to experience the process of research. The fourth approach is the *narrative* one; it enmeshes visual data in a sequence not necessarily arranged by the time succession of the events captured in the photographs. The use of photographs in our research falls within the latter category; the collected visual material has been thematically organized.

An alternative classification – although showing some overlapping with the previous one – is based on who the producer of the photographs is. According to Banks (1995), any of the following three options is possible: the researcher producing images to study a phenomenon, the researcher analyzing images produced by the participants themselves who are involved in the phenomenon under investigation (cf. Hyerle's (2009) study on education; Ruby's (2006) study on anthropology) and the researcher collaborating with the participants in the production of images of the phenomenon under study (Turner 1992 documents how Amazonian Indians in Brazil used the video technology provided by him). Our discussion is neither about the examination of images produced by others nor about the collaborative production of images between the researcher and the participants. Our focus is on the use of photographs produced by the researcher during his/her data collection for subsequent analysis and ultimate presentations of the findings.

In summary, we trace the non-participant researcher's journey from the shooting through the analysis to the presentation of photographs as shown in Figure 1.

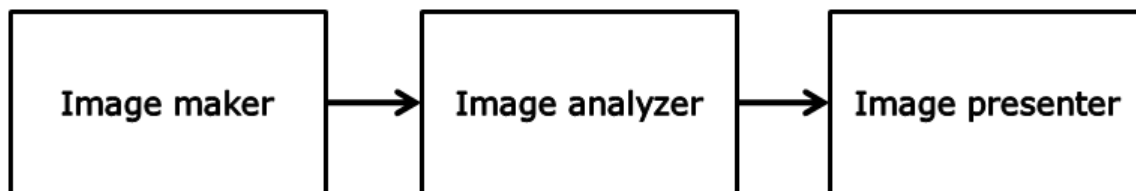


Figure 1: The researcher's role in producing, analyzing and presenting photographs

In this paper, we are treating photographs neither as art pieces, which are regarded as aesthetic objects – like the ones that we can find at any art gallery – nor as documentary photographs, which claim to be telling the truth – like the ones that we can see in the issues of the National Geographic publication. Neither are we treating them as personal objects, which might evoke intimate remembrances – such as the ones that we may have in our family album. Although these categories are not necessarily mutually exclusive, we are particularly interested in the use of researcher-generated photographs during the fieldwork for the creation of new knowledge, which is primarily oriented to an academic community (Wagner 2007). The process of producing, interpreting and presenting photos not only strengthens the chain of evidence but also entails a knowledge creation exercise (Pink 2007).

Before moving to the explanation of how we treated visual data in our research, we feel compelled to let the reader (and the conference organizers) know that we have not disregarded the advice “to refrain from using colors [since] not everyone has access to color printers”. Including them in black-and-white, we believe, would have significantly reduced the chances of conveying the message; we do hope that the readers of this paper can appreciate the photographs presented here in full on any color monitor, which are widely accessible these days.

Using Photographs in Ethnographic Research

In the following sections, we reflect upon the use of photographs along the three moments of the research process: from the fieldwork through the analysis to the writing up stages as represented in Figure 1. We admit that the decision as to whether to insert some photographs under one heading or the other is rather arbitrary since they all need to be seen in a holistic fashion. Our intention in doing so is to demonstrate the so-far ignored usefulness of visual material in information systems research. In order to attain this objective, we reflect upon an ethnographic research project conducted in six rural communities in the northern Peruvian Andes between July and November 2005. In order to put the analysis into perspective, the objective of that research was to understand the role certain individuals, named as “activators of information”, played in the dissemination of computer-mediated information through the existing social networks (cf. Díaz Andrade and Urquhart 2009).

The Researcher as Image Maker: During the Fieldwork

We presume that the average information systems researcher is not, as we are not, a qualified photographer – maybe not even an amateur – who is not necessarily aware of technicalities like focus, intensity, grain and composition when producing photographs. Similarly, the camera used for this research was not a sophisticated one; it was a cheap one. Our assumption is that the researcher uses a camera to capture the evidence of what he/she finds during the data collection stage to substantiate his/her findings, support his/her arguments and, most importantly, show the chain of evidence (Yin 2003) in the subsequent analysis.

Since the research was conducted to understand the social implications of information systems, it can be labeled as an *empirical social inquiry*, the “effort to generate new knowledge of culture and social life through the systematic collection and analysis of sensory evidence and other forms of real-world data” (Wagner 2007, p. 26). This definition makes explicit the use of the researcher’s senses for gathering data while in the field. Whereas in the field the researcher perceives a visual world of colors, shapes, symbols, places and arrangements, later on, when trying to make sense of the collected information, the researcher resorts to his/her memory and photographs are entirely apt to support these “two psychological meanings: perception and memory” (Milgram 1977, p. 50).

During the fieldwork, the main challenge lies in how to represent social aspects in a photograph – it is apparent that representing material objects becomes a much easier endeavor (Banks 2001). We know, however, that “the culturally fashioned built environment, including items of material culture, persons and social actions, all are visually available and symbolically significant when making visual sense of the seen world” (Ball 1998, p. 135). Thus, it is up to the researcher to capture this visual cultural environment; a photograph, we claim, can assist the researcher in producing an account of the available visual material. Photographs are closer to a *visual diary* rather than a *visual record*; the latter has an objectivist connotation, the former recognizes the researcher’s reflexivity during the fieldwork. The content of the photograph is dictated by what the researcher considers relevant at a specific space and time (Prosser and Schwartz 1998). While the photographs produced by one of the authors of this paper involved in the fieldwork were not randomly taken, they were not part of a predefined photographic plan.

Caveats

One of the major concerns is about the researcher’s ability to graphically represent subjects and objects from a different background (Goldstein 2007). Addressing this issue requires a conscious involvement of the researcher into the participants’ world to be able to capture instances of social life. Suchar (2006) puts forward the “interrogative principle of photography” (p. 212), so the research problem leads the production of images. Unlike Suchar (2006), who assumes photographic material as the unique source of data – his research on the living styles in London is purely based on photographs – we prefer to stick to the broader idea of using the researcher’s senses and not only vision. Neither do we grant visual data a higher status vis-à-vis other types of data; we propose the use of photographs as another source of data. In our research, besides the photographs, we also conducted 36 in-depth

interviews and produced over 200 pages of hand written field notes as primary sources of data; the secondary sources of data came in the form of demographic data and reports.

When doing ethnography, the researcher as an outsider has the advantage of seeing what the participants take for granted, but the researcher going into protected domains may be problematic; building rapport with participants becomes a major component of the ethnographer's fieldwork. It is not an easy venture and takes time to build trust with participants who might perceive the researcher as an intruder who is trying to pry into their culture and habits. If we introduce the use of a camera, we are adding a mechanical device that can be seen as a threat in the usually fragile researcher-participant relationship (Prosser and Schwartz 2006). The simple fact of shooting may inhibit some participants; however, the same argument can be said about using an audio tape recorder during an interview. Incidentally, through informal interactions with the would-be participants during the fieldwork, we identified very communicative individuals who made clear their interest in contributing to the research; however, as soon as the *formal* audio taped interview started – with the participant's explicit consent, the same individuals who were very eloquent in expressing their views turned out to be monosyllabic in their answers. Three out of the 36 audio taped interviews barely produced usable data for the research. It was in these cases where the photographs became of extreme value, since the intention was not to capture images of the participants but rather additional data that complemented what the participants did not say.

Unless photographs are taken a long distance from the object, they are not unobtrusive sources of data (Adelman 1998). The photographs shown in Figure 2 are unobtrusive since they were taken from the hills surrounding each of the communities where the research was conducted: Chanta Alta, Huanico, San Marcos, Puruay Alto, Llacanora and La Encañada. The purpose of taking these photographs was to capture the spatial and physical differences among the different sites – e.g., Puruay Alto is a hamlet whose dwellings are spread over a vast mountainous area and La Encañada is a compact small town in an Andean valley.



Figure 2: Representation of the spatial and physical environment

Whereas some of the photographs were about buildings and public spaces representing the cultural visual environment of those communities, we also produced photographs of local people. In these cases, the researcher needs to make a decision whether the photograph should be overtly or covertly taken (Prosser and Schwartz 1998).

In Figure 3 we show photographs overtly taken, where the presence of the researcher when shooting was not unnoticed by the participants. These photographs illustrate the use of the facilities available at the local information centers (known as *infocentros* by local people). The one at the left hand side (a) shows the Llacanora infocentro manager teaching a local girl how to use MS Word®. The photograph at the right (b) depicts a group of La Encañada students, who were not admitted to the local school that day because their haircut was not short enough according to the institution standards, watching the movie *Rambo III* rented from the infocentro manager. These two photographs convey rich information that is going to be analyzed in the next section in order to be consistent with the headings we are using in this paper.



Figure 3: Different uses of the infocentro: a. The Llacanora infocentro manager teaching MS Word® to a local girl. b. La Encañada schoolboys watching the movie *Rambo III*.

The issues just discussed raise ethical considerations. The photographs shown in Figure 3 were shot from a short distance and it was obvious to the participants they were being photographed. In this case, their permission to photograph was sought in advance. Independently of whether the photograph was taken from a short or a long distance, we made a deliberate effort to protect the subject's anonymity. It should be noted that in Figure 3, the participants' faces, even though the photographs were shot from a short distance, are not recognizable.

At this point, the reader should have already realized that the simple description of the location of the infocentro and its manager gives enough information about the participant that we can no longer guarantee his/her anonymity, but we also note that the participants' identification has been made through a textual explanation, not through the photograph. Our point is that photographs do not expose participants any more than texts do. We highlight that we were not interested in identifying individuals but in uncovering aspects of everyday life related to the transmission of information and the use of computers in rural communities. In addition, we point out that none of the photographs recorded during the fieldwork were rehearsed; doing this would have jeopardized the genuineness of the instances represented in the visual material.

The Researcher as Image Analyzer: During the Analysis

After the four-and-half months, the author who conducted the fieldwork was back in his office – in a completely different context – thousands of kilometers away with no possibility of going back to the field. Although taking photographs during the fieldwork had been considered in advance, the original intention was to have photographs simply as a personal record of what he found during his time in the field – not as a source of data. It was during the data analysis stage that he instinctively started going back to the more than 110 photographs, both to improve his recollection of the facts he found in the field and to literally see what the situation he was trying to interpret was. At that point, he realized that they contained valuable information that could be useful in the analysis. Therefore, he decided to make the photographs part of the data to be analyzed and they were uploaded onto NVivo® software package along with the other collected sources of data.

The analysis was informed by the Glaserian version (1992) – as opposed to the coding paradigm proposed by Strauss (1987) – of grounded theory (Glaser and Strauss 1967) under an interpretive approach (Charmaz 2006). The photographs were analyzed in the same way as the other sources of data; that is, following an inductive approach from concrete pieces of data to categories at a higher level of abstraction. Since this is not a paper on grounded theory method, we do not show here the complete grounded theory analysis, but we do show some open codes to illustrate how photographs can be coded in the same way as other sources of data. It is the analytical material contained in the photographs – not their quality – that is the essential element for the analysis (Wagner 2007); the researcher can render a plausible interpretation even from average photographs.

Given that photographs contain material germane to the subject matter, which make possible the dialectic process between themselves and the researcher, they are treated as “epistemic objects” (Ewenstein and Whyte 2009). Before embarking on this dialectic process the researcher must be aware of the context where the research was conducted. During the analysis stage, the researcher needs to interpret both the photograph’s internal narrative – the content of the picture itself – and its external narrative – the context in which the image was produced (Banks 2001). Since photographs are visual representations of specific locations and instants in time, the exercise of interpreting them is tantamount to constructing representations of representations (Harper 2006a). Research awareness of the context, therefore, becomes a hallmark during the interpretation process.

Silverman and Masvarti (2008) recognizes the methodological and theoretical issues when analyzing visual material. The use of visual data has been mainly criticized for the subjectivity when analyzing the images, unrepresentativeness of the collected material and specificity in data collection (Pink 2007). On the issue of subjectivity, we reiterate that we are positioned under the interpretive paradigm, where being subjective in the analysis not only is allowed but also is a basic assumption (Guba and Lincoln 1994). Interpreting a photograph should not be different from interpreting an interview; the researcher must know the context and understand the subject matter in order to produce a plausible interpretation. We stretch the issue of subjectivity even to a quantitative researcher; for instance, a researcher conducting factor analysis needs to make an informed decision on the number of factors and how to label them depending on the context of the research and his/her knowledge of the topic. On the issue of unrepresentativeness, data sampling for interpretive researchers is informed by theoretical sampling (Charmaz 2006) – collecting the pieces of data that can provide deeper insights into the phenomenon under study and not by random sampling at all. On the issue of specificity, the researcher needs to put into practice the hermeneutic principle – the understanding the whole to make sense of the parts – as much as comprehending the parts to grasp the whole (Klein and Myers 1999).

Eliciting Themes from Photographs

Although photographs do not have the grammar structure of language, they do embody a powerful symbolism (Harper 2006a) and provide the visual availability (Ball 1998) that helps in the analysis stage. However, as we explained earlier on this paper, photographs are not unambiguous representations of reality; the researcher – fully aware of the context of the research – must unpack their meaning during the interpretive exercise. Looking at the images facilitates the researcher’s reflections upon his/her experiences during the fieldwork and elicits ideas and concepts, which should be interpreted in a holistic manner vis-à-vis the other sources of data.

At this point, the researcher becomes an interpreter of images. Reflexivity should not be conceived as an antidote to subjectivity but as a central aspect of producing knowledge through an interpretive exercise (Pink 2007). Reflexivity entails the researcher’s consciousness of his/her own position in the research process while interacting with the participants: “the most trivial photograph expresses, apart from the explicit intentions of the photographer, the system of schemes of perception, thought and appreciation common to a whole group” (Bourdieu 1990, p. 6). For instance, we had explained that in Figure 3.a, the Llacanora infocentro manager was teaching MS Word[®] to a local girl; at least, that was they both said when they were asked what they were doing while the researcher was observing the usual activities at the infocentro. Now, in the analysis stage, we notice that the photograph clearly reveals that it is the infocentro manager who is taking an active stance in using the computer: he is sitting right in front of the monitor and has control over the keyboard; the girl is sitting next to him just staring at the screen, where the effects of his actions are reflected. The physical arrangement of the subjects and their actions suggest that instead of learning-by-doing she is learning-by-watching. In line with the coding procedure of grounded theory, the analysis of this photograph, along with the other sources of data, generated the open code *learning to use computers by watching*. Figure 3.b is specially revealing. We can infer that there is a strict directive in place regarding haircuts at the school – some viewers even judge that the portrayed students’ hairdos are short enough and some others may

even disagree with the rule of not allowing the attendance at classes for those students whose hairstyle is not according to the school standards. While the observation on the haircut assisted the researcher in understanding the existing conventions in the educational environment in La Encañada, the photograph – in conjunction with other sources data – provided additional information related to the infocentro and its operation. The fact that the students turned out in droves to watch a 1988 movie at the infocentro was twofold: the infocentro fulfills an entertainment function in the community (open coded as *infocentro as a leisure center*) and the infocentro manager makes some money by renting the DVDs – most of them illegal copies – he had acquired to support the infocentro operation (open coded as *financially fragile operation*).

It happens that once at home, on calm reflection, away from the demands of the fieldwork, the researcher may well discover things which might have been unnoticed during the fieldwork (Strecker 1997). For instance, in Figure 4 we present two photographs containing information that would also have been ignored in the field, but a closer inspection allows the discovery of some revealing details. The photograph at the left hand side (a) portrays a woman (dressed in red) and her child waiting for a phone call outside the Huanico infocentro. When the photograph was produced, the intention was to have an image of how people use the phone service at the infocentro. A second look at the photograph reveals the loudspeaker (just under the eaves to the left of the yellow sign indicating the infocentro location), which was frequently used to announce the incoming calls – after an initial call the caller would ring again in ten minutes or so to allow the addressee time to get to the infocentro. This was a common practice that reflected the value local people gave to the local infocentros, especially in those where, other than at the infocentros, telephones were not available – i.e., Chanta Alta, Huanico and Puruay Alto. Two open codes were produced from this photograph: *phone communication* and *loudspeaker as a communication tool*.

The photograph at the right (b) is even more informative on how photographs can assist the researcher in the analysis. It was taken to document the price list of the services offered at the Puruay Alto infocentro. A careful inspection makes evident that some Spanish words had been misspelled – to some extent, a predictable finding since the available demographic information indicates the low level of education in the region. However, it also shows that the misspelled words “servisios” (sic), “telefono” (sic) and “targeta” (sic) had been corrected in red; they read now “servicios”, “teléfono” and “tarjeta”. This observation denotes that local people, presumably the schoolteachers, do care about the infocentro and had corrected, or told the infocentro manager to correct, the misspellings (open coded as *illiteracy in the countryside* and *being part of the community*). The photograph also suggests the paucity of resources of the infocentro; instead of preparing a new poster, the original one was amended – the same poster was still there during a subsequent visit to the infocentro in mid October 2005 (as can be seen, the photograph was taken on August 5, 2005).



Figure 4: The unnoticed information during the fieldwork. a. Huanico infocentro’s loudspeaker (circled). b. Misspellings (and subsequent amendments) in the list price poster at Puruay Alto infocentro.

In Figure 5, we show two photographs taken to represent how people share information in rural societies. The left-hand one (a) depicts the milk truck in one of its stopovers for milk collection as part of a 19-hour round journey from and back to Cajamarca, the main city in the region. The truck driver acts as a messenger when local people ask

him to pass messages like “Tell my uncle in Malat [one of the stopovers] that I am going to visit him on Saturday” or to deliver sacks of potatoes to someone else. The one at the right (b) portrays the Saturday open market in Chanta Alta main square, where people from the surrounding hamlets and villages gather not only to trade produce and dairy products but also to exchange information. These photographs produced the open code *information brokering through face-to-face contacts*. They are explicit reminders and important pieces of evidence supporting one of the main findings of the research: that computer-mediated information is accessed by just a few computer enthusiastic individuals and is distributed through the existing face-to-face social networks.



Figure 5: Information sharing through face-to-face contacts. a. The milk truck in one of its stopovers. b. Chanta Alta's Saturday open air market.

The examples shown so far represent the contextually bound characteristics and aspects of social life that are visually available (Ball 1998) and can be captured in a photograph. We emphasize, however, that the interpretation of visual material needs to be informed by the research problem, which helps the researcher in making sense of and classifying the photographs (Prosser and Schwarts 1998).

The Researcher as Image Presenter: During the Writing Up

Although the heading of this section may sound contradictory, it makes explicit that the final output of the research process is a report, which by definition comes in textual form. Indeed, when presenting the evidence, the researcher uses written language to describe and interpret the data collected during the fieldwork and scrutinized during the analysis stage. The written word becomes the utterance to communicate the findings and to convey the implications of the research. However, photographs can be a bonus by providing information that it is difficult to present in textual form only (Wagner 2007). Visual material, we argue, should be treated in the same way as textual or numeric data for supporting an argument and presented alongside the textual analysis (Ball 1998).

The power of photographs lies in their ability to connect researcher and viewers in the description of the fieldwork and the explanation of the analysis. A remarkable case in point is Rexford Tugwell, the economics professor at Columbia University and Under Secretary of Agriculture, who was in charge of the resettlement of impoverished farmers during the early 1930s in the United States. He co-authored the first ever illustrated economics book that included photographs of the poor migrant laborers to explain abstract economic concepts (Smithsonian Institution 1965). Photographs can close the gap between the researcher, who has lived the experience, and the viewer, who is trying to capture the essence of the research, by providing a graphical and vivid testimony (Cook 2005; Pink 2007).

We admit, however, that presenting photographs only is not enough to inform the audience. The audience, who by and large is composed of readers, still needs the researcher's words to understand the message. Photographs must be accompanied by both precise descriptions explaining the context of where specific graphical evidence comes from and theoretically informed texts supporting the researcher's interpretation (Ball and Smith 2006). The description of the context gives full meaning to the photograph (Becker 1998), while the theoretically informed interpretation unpacks its encapsulated “epistemic object” (Ewenstein and Whyte 2009). Textual references and captions, like

balloons in comic strips, have a twofold effect: they give meaning to the photographs and allow the viewer to understand the researcher's interpretation of the visual material while showing the chain of evidence (Yin 2003). The accompanying text should be written in a way that invites the reader to inspect the photographs in order to fully make sense of the analysis; the reader should be actively engaged in reading the text and looking at the photographs to realize the popular saying "seeing is believing". Presenting photographs should provoke insightful thoughts from the viewers while making them accomplices of the research process: "You are there... because I was there" (Clifford 1988, p. 22, cited by Strecker 1997).

Assisting the Viewer to Interpret the Images

Photographs support the researcher's descriptions of the spatial environment and his/her explanations of the social context (Aitken and Craine 2005) and present scenes that the audience otherwise could not have seen. The power of photographs lies in their ability to represent both inanimate cultural material items (e.g., buildings) and people's lives in their social environment, either with or without their cultural material items (Ball 1998).

However, photographs are polysemic; thus, one photograph can be interpreted in different ways by different observers (Wagner 2007). It is the researcher who ultimately gives meaning to the photographs and can somewhat twist the subject matter to his/her point of view, shaping the viewer's response by explaining the content and context of the image (Goldstein 2007). The major advantage of inserting photographs is that the reader does not simply rely on the author's fashioned account of the written report, but can see a fair amount of the original source of data: "Sharing these photographs with the reader is in one sense analogous to sharing with them pages of 'raw' filed notes, before they are interpreted and fashioned into a written report for publishing. In another sense, it is to share with the reader something of the messy processual and fragmentary character of how analysis is always fashioned and arrived at" (Ball 1998, p. 141). Including photographs should not be different from inserting participants' quotes in order to add credibility and traceability to the research work.

To illustrate how photographs can assist the viewer in understanding the researcher's interpretations, we present a set of three photographs in Figure 6. The first one (a) depicts a farmer reading information from the billboard outside the San Marcos infocentro; it represents another means of information distribution in the rural environment (open coded as *top-down information dissemination*). The photograph in the middle (b) portrays a group of peasants and schoolboys playing soccer in Huanico; the main theme of this photograph is marked by the red circle on one of the spectators who has a radio hanging around his neck. During the fieldwork, it was found that local people listen to the radio while doing their usual activities; in fact, local radio broadcast stations are a very popular means of transmitting different types of information – e.g., farming information, greetings, etc. (open coded as *radio as an ubiquitous medium for information distribution*). The photograph at the right (c) shows the mural painting on the exterior of Puruay Alto infocentro; it is a communal artwork that demonstrates the high importance the community grants to the infocentro, which was also built by the community (open coded as *infocentro as a communal icon*).



Figure 6: a. A farmer reading information from the San Marcos infocentro's billboard. b. A radio (circled in red) hanging around a peasant's neck in Huanico. c. Mural painting on Puruay Alto infocentro's exterior.

Figure 7 portrays two images that represent the technical restrictions existing in some of the infocentros – in Chanta Alta, Huanico and Puruay Alto there was no electricity supply at the time of the fieldwork. The photograph on the left (a) portrays the Chanta Alta infocentro manager hosting the daily radio program *Cubriendo Caminos (Along the Road)* – open coded as *locally broadcasting information* – where he broadcasts, besides messages from local people, information usually obtained from the Internet and provided by the group of non-governmental organizations who had brought the infocentros initiative to the region. The Chanta Alta radio station transmitter is powered by diesel. The photograph on the right portrays the Puruay Alto infocentro's computer; it operates two hours per day only since its energy source comes from the solar panel, which is mainly used for the local telephone (open coded as *technical restrictions hampering the use of computers*). The common and noticeable feature of these two photographs is the makeshift appearance of the facilities.



Figure 7: a. Chanta Alta infocentro manager hosting his daily radio program from the local station. b. Puruay Alto infocentro's computer.

Sharing photographs is making a call to the audience to be part of the world as has been perceived by the researcher. During the writing up stage, photographs are neither inserted just to break the boredom of a long text (Prosser 1998) nor to present incontrovertible objective proof of what the researcher has seen in the field. Photographs are included not only because they have the power of endorsing the researcher's textual explanation (Ball and Smith 2006) but also because they provide an additional element in understanding the researcher's interpretation. While it is impossible to represent visually the abstract aspects of communal life around modes of information transmission and the meaning of using computer in rural areas, the content of a photograph can effectively help in transporting the audience to the context where the socio-technical phenomenon under study takes place by presenting scenes of the cultural artifacts and participants' actions. The researcher needs to be selective and decide which photographs are going to be included in the report and provide an explanation of both their context and content to support his/her interpretation.

Conclusion

In this paper, we have made a strong argument for visual material to be used as part of the research process in information systems. The use of photographs in the information systems field is almost nonexistent; the few instances where photographs have been included that we are aware of are limited to illustrate some points not completely explained in the textual rendering. We claim, however, that photographs can effectively contribute to the research process not only by strengthening the researcher's reflexivity but also by enhancing the communication of the findings to the audience.

Using Photographs along the Three Moments of the Research Process

We have followed the researcher's journey from the data collection in the fieldwork through the analysis to the presentation of the results. We have highlighted the availability of visual material during the fieldwork and how the researcher receives a large amount of information from the sighted world that surrounds us with plenty of shapes, colors and symbols. At the present time, when there are neither technical nor economic obstacles to the use of a camera, there is no apparent reason why visual material should not be collected. Being an accomplished photographer is not a requisite for the researcher; for the purpose of research, it serves well if he/she is able to gather photographic images that capture the material aspects of the subject matter in the form of visual notes.

The meaning of photographs for the researcher at the data collection stage is like that of an anchor to the experience that will be recalled while analyzing the data. Photographs should be treated as epistemic objects since they contain information from which knowledge can be extracted. We made clear our interpretive philosophical position, whereby the researcher's role goes beyond just demonstrating an objective reality. We do not see photographs as objective records; rather to the contrary, we recognize that photographs, like words, are imperfect representations of reality. Since the ethnographic researcher is immersed within a particular context during the fieldwork, the context both imposes restrictions on what can be captured and to some extent shapes the researcher's intention at the time of shooting. These aspects need to be taken into consideration during the reflexive process and that is why we contend that photographs must be analyzed in a holistic fashion along with other sources of data for eliciting themes during the interpretive analysis. In our case, the visual material was coded according to the tenets of the grounded theory method.

We have also argued that there is no reason why the researcher should keep the captured and analyzed images to himself/herself; the audience will greatly appreciate having access to the visual material in the final report. It contributes to the chain of evidence; presenting images makes the researcher's argument stronger than a purely textual report. Although we admit that photographs can be interpreted in different ways by different observers, we have emphasized that it is the researcher who ultimately has the role of persuading the audience of the plausibility of his/her analysis, so the photographs must go together with written analysis. Analyzing and presenting photographs help the researcher, while transmitting a sense of authenticity, in producing a plausible account of the phenomenon under study and invite the audience to see the world the researcher has lived in.

Ethical Considerations

Ethical issues must be taken into consideration by researchers considering the inclusion of images in their research projects. When producing the photographs, the researcher should ask permission for the participants to be photographed, unless it is a photograph to be taken from long distance where the object of the image is not one or more recognizable individuals but aspects of social practices (e.g., Figures 5.a, 5.b, 6.a and 6.b) or physical representations (e.g. Figures 2, 4.a, 4.b, 6.c and 7.b).

When presenting the photographs, the researcher needs to make a cautious decision as to which ones are going to be included in the report. Presenting photographs may disclose participants' identities and compromise research ethical standards, especially if the photographs are close-up images. Although whenever possible we avoided taking close-up images in our research, there were some instances where we had no other option but to produce photographs from a short distance. In such cases, besides asking permission to photograph the participants – without interfering with their normal activities, the photographs were composed in a way that made the participants unrecognizable (e.g., Figures 3.a, 3.b and 7.a). In fact, the textual explanation provides more clues than the images of who the portrayed participants are.

Why Using Photographs in Information Systems Research

Although the title of this paper may suggest that we are proposing a rather radical approach, the use of photographs in research has become a common practice not only in the disciplines of humanities (e.g., sociology and anthropology) but also in some fields closer to information systems such as marketing and management. In particular, we are supporting the use of photographs in ethnographic research. Given that doing ethnography involves the researcher living in the participants' world for an extended period of time, where he/she – in addition to the more conventional sources of data like interviews, questionnaires and observation – receives a considerable amount of information through his/her visual sense, the use of photographs is of special value in ethnographic

research. The question naturally arising would be “why not include visual data as part of the research material?” Since we are almost certain that information systems researchers do use visual material in the research process, we feel compelled to put the question in another way: “why not make explicit the use of visual data?” In this paper, we have explained how the use of photographs can be made explicit.

Both the researcher and the audience of ethnographic research would be the major beneficiaries from the inclusion of photographs, especially if the research has been conducted beyond the organizational boundaries in the non-Western world. As has been explained throughout this paper, photographs not only can capture the peculiarities of the context where the research effort takes place but also invite the audience to literally have a look at it – a concept which some members of the information systems research community may not be familiar with. In addition, photographs become signposts along the interpretive exercise, adding authenticity to the research account.

We trust this paper contributes to the acceptance of using visual material in the information systems community. We would like to encourage information systems researchers to adopt the unorthodox approach we are proposing here and make a call to the information systems journals to consider accepting the inclusion of color photographs, at least in their electronic versions, if the cost of including them on hardcopy is prohibitive.

Challenges Ahead

Though we have proposed the use of photographs in information systems research, it could be widely abstracted not to include other visual data such as drawings, videos and mental maps. However the ability to use photographs in the print media helps in ensuring that the intended interpretation by the researcher is communicated to the reader, which is in some sense equivalent to precision in writing. So, how the use of photographs enhances this, and how to avoid the unnecessary use of visual data in reports requires further study. As we recognise that information systems research cannot be done completely visually, we need to study further the necessary mix of photographs and other sources of data in all the three moments of research we propose here. The use of photographs in these moments needs to be developed so that this concept can rightly be used as a methodology in future.

At this stage, we are relying on one field study only for the development of our three-moment model presented in Figure 1. Hence, further applied research, similar to the experiments with and without photographs conducted by Bransford and Johnson (1972) in the field of education, could be devised to elicit the advantages of photographs in information systems research in all the three moments.

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