Qualitative HCI Research:

Going Behind the Scenes

Synthesis Lectures on Human-Centered Informatics

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ABSTRACT

Human–Computer Interaction (HCI) addresses problems of interaction design: understanding user needs to inform design, delivering novel designs that meet user needs, and evaluating new and existing designs to determine their success in meeting user needs. Qualitative methods have an essential role to play in this enterprise, particularly in understanding user needs and behaviours and evaluating situated use of technology. Qualitative methods allow HCI researchers to ask questions where the answers are more complex and interesting than "true" or "false," and may also be unexpected. In this lecture, we draw on the analogy of making a documentary film to discuss important issues in qualitative HCI research: historically, films were presented as finished products, giving the viewer little insight into the production process; more recently, there has been a trend to go behind the scenes to expose some of the painstaking work that went into creating the final cut. Similarly, in qualitative research, the essential work behind the scenes is rarely discussed. There are many "how to" guides for particular methods, but few texts that start with the purpose of a study and then discuss the important details of how to select a suitable method, how to adapt it to fit the study context, or how to deal with unexpected challenges that arise. We address this gap by presenting a repertoire of qualitative techniques for understanding user needs, practices and experiences with technology for the purpose of informing design. We also discuss practical considerations such as tactics for recruiting participants and ways of getting started when faced with a pile of interview transcripts. Our particular focus is on semi-structured qualitative studies, which occupy a space between ethnography and surveys—typically involving observations, interviews and similar methods for data gathering, and methods of analysis based on systematic coding of data. Just as a documentary team faces challenges that often go unreported when arranging expeditions or interviews and gathering and editing footage within time and budget constraints, so the qualitative research team faces challenges in obtaining ethical clearance, recruiting participants, analysing data, choosing how and what to report, etc. We present illustrative examples drawn from prior experience to bring to life the purpose, planning and practical considerations of doing qualitative studies for interaction design. We include takeaway checklists for planning, conducting, reporting and evaluating semi-structured qualitative studies.

KEYWORDS

qualitative methods, QDA, grounded theory, Thematic Analysis, Ethnography, Observational studies, interview studies

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Acknowledgments

This book owes its existence to the many students and researchers we have worked with over the years. It builds on an earlier chapter on Semi-Structured Qualitative Methods published by the Interaction Design Foundation (Blandford, 2014), and a few sentences from that text may have made it through into this one unscathed.

We cannot list everyone who has shaped and challenged our thinking about qualitative methods: there are too many, and we would be sure to forget someone important. We thank you all. Suzanne Amos, Ellie Burgess, Imogen Lyons, Nikki Newhouse, Olga Perski, Sheila Pontis and Kathy Stawarz gave constructive feedback on an earlier draft of this text; many thanks! Paul Cairns, Marc Hassenzahl, Jesper Kjeldskov, Helena Mentis and Mark Perry have made excellent suggestions for improving this manuscript; we have addressed as many as possible of their recommendations, but remaining limitations are our responsibility. Emily Blandford and Smaragda Magou have delivered illustrations that surpass our rather limited graphic design skills. Aisling O'Kane and Atish Rajkomar have given permission to include photographs from studies led by them. Our research has been funded by EPSRC, ESRC, MRC, SSHRC and NIHR.

Preface

The motivation for writing this book came from several different directions. The key driver was that there has not been a good text that we could direct our students to that resonates with their interests and the problems they are addressing. There are some excellent texts from the social sciences and from healthcare, but they do not deal with problems of interaction design, user requirements or user experience when interacting with technology. Conversely, there are many excellent HCI texts that focus on observation, task analysis or research methods, but none that focus specifically on qualitative methods. We intend that this book should plug that gap.

A second motivation comes from the perennial question or challenge: what constitutes quality in qualitative HCI research? Is it even research? We should raise the quality of the discourse on what constitutes valid, reliable and valuable qualitative research in HCI. We should also raise the quality of that research, so that it becomes more valuable and has greater integrity.

We have chosen to draw on the analogy of going behind the scenes when making a documentary. Our main sources of inspiration for this have been Dom's experience of making short films to communicate our research and Ann's delight at watching "behind the scenes" footage on the making of wildlife documentaries (BBC, 2014). Of course, a qualitative study is expected to have a scientific rigour that is not expected of many documentaries, but they both share issues in gathering data, creating a narrative and representing some aspect of reality to inform an audience. Our focus on going behind the scenes means that we draw a lot on our own experiences, because we know what went on behind the scenes in our studies. So long as there is little tradition of reporting these details, that information is not accessible for other researchers' projects, and it is difficult to be reflective about the work of others when you don't have the insider knowledge. So we hope this book will encourage you to consider taking readers of your own research "behind the scenes"—providing them with useful detail and justification on what you did and why.

In this book, we are pre-supposing a good general knowledge of HCI, but less detailed knowledge of qualitative methods. Our primary audience is Master's and Ph.D. students in HCI and related areas who are planning their individual projects. Other audiences include HCI practitioners who are planning in-depth studies, or people with a background in qualitative methods but who are new to HCI. We hope that this book will help you design and conduct excellent qualitative HCI studies.

Ann Blandford, Dominic Furniss and Stephann Makri, February 2016

Glossary

The following abbreviations are used in this book:

DCog	Distributed Cognition
DiCoT	Distributed Cognition for Teamwork
GT	Grounded Theory
HCI	Human–Computer Interaction
QDA	Qualitative Data Analysis
SSQS	Semi-Structured Qualitative Study
TA	Thematic Analysis

CHAPTER 1

Introduction

BEHIND THE SCENES

Qualitative methods play an important role in Human–Computer Interaction (HCI): in requirements gathering, in acquiring an understanding of the situations in which technology is used and might be used and in evaluating how technologies are used in practice. Although there are scores of texts on qualitative methods in the social sciences, there are surprisingly few in HCI. The concerns of HCI are somewhat different from those of the social sciences, with a focus on technology use for informing the design of interactive systems, rather than on social phenomena between individuals, in organisations and in society more generally. Our aim in this book is to take you behind the scenes, to give guidance on how to plan, conduct and report qualitative studies in HCI. Throughout, we draw on the metaphor of making a documentary to bring to life important issues, and to make producing something a more tangible part of the activity. Going behind the scenes allows us to examine important considerations for qualitative research in the field of HCI that have seldom been discussed elsewhere.

The emphasis we place on different topics is inevitably colored by our own experiences. Our research has been in two main areas: healthcare technologies (e.g., Furniss et al., 2015; Hsu and Blandford, 2014; Rajkomar et al., 2015) and interacting with information (e.g., Blandford and Attfield, 2010; Makri et al., 2008a; Makri and Warwick, 2010). The first of these brings challenges, particularly in engaging with patients and dealing with sensitive issues within complex healthcare processes. The second brings a different kind of challenge: that interacting with information is often not the primary focus of someone's activity; it is a secondary activity that they barely notice, so gathering useful and reliable information about users' interactions can be difficult. Using these and other experiences, we review challenges and provide advice for designing and conducting qualitative HCI research.

1.1 AN OVERVIEW OF QUALITATIVE APPROACHES AND METHODS IN HCI

There are many, many approaches and methods for qualitative research. Some of them have names, such as Ethnography, Contextual Inquiry, Focus Groups, Grounded Theory, Interpretive Phenomenological Analysis, Discourse Analysis or Thematic Analysis; others do not. Some—such as

Contextual Inquiry and Grounded Theory—are widely used in HCI, while others—such as Interpretive Phenomenological Analysis and Discourse Analysis—are not; we focus on the more widely used methods and approaches in this book. Some of these names have precise meanings; others are often used as generic descriptors of qualitative research. For example, Grounded Theory (GT) has been described as a "bumper sticker" (Bryman and Burgess, 1994) to cover a broad range of qualitative approaches, even though there are strong principles underpinning GT proper. This makes it particularly important for HCI researchers to be open and transparent when explaining and justifying the qualitative approaches they have adopted. When writing up an approach, it is essential for researchers to explain in detail what they did and why, giving reasons for adopting, adapting or combining particular established approaches.

Denzin and Lincoln (2011) discuss a research process in terms of five phases, or levels of activity. The first phase is the researcher—you!—who comes to the study with their individual history, experiences, values and understanding; the researcher shapes the research, and should be aware of the role they are playing in the research.

The second phase is the research paradigm. In Chapter 6, we discuss research paradigms in terms of quantitative and qualitative approaches that are widely used in HCI. In brief: quantitative research is most commonly applied to test pre-determined hypotheses, whereas qualitative approaches aim to describe and explain phenomena in a rich, often exploratory, way. Denzin and Lincoln (2011) identify four major paradigms for qualitative research: positivist and post-positivist; constructivist-interpretive; critical (Marxist, emancipatory); and feminist-poststructural. Given the aims of HCI studies, focusing on the design and use of interactive technologies, qualitative HCI research generally fits within the first two of these paradigms, and this book focuses on the constructivist-interpretive paradigm. This paradigm assumes a subjective reality that is shaped by the interpretations of researchers and study participants. This can feel uncomfortable at first, particularly to those who have been brought up in a classic scientific paradigm where it is assumed that there is an objective reality "out there" and that the role of research is to establish what it is. This book is intended to provide tools and techniques to conduct high quality interpretive qualitative HCI research.

Denzin and Lincoln (2011) label their third phase "research strategies." This is the phase that focuses on the strategy for addressing the research question or purpose of the study. Their list of strategies includes several that are commonly used in HCI, including ethnography, participant observation, ethnomethodology and GT. We discuss these approaches in Chapter 6, after discussing the particular methods that make up a study (Chapters 4 and 5).

Their fourth phase is "methods of collection and analysis." They include interviewing, observation, autoethnography and focus groups as data collection methods; to this list, we add think-

aloud as a technique that is particular to HCI (Chapter 4). We separate out analysis (Chapter 5), focusing particularly on Thematic Analysis (Braun and Clarke, 2006) as a technique for data analysis that is widely used in HCI.

The final phase according to Denzin and Lincoln (2011) is that of interpretation and evaluation. The questions in this phase are broadly: what can be learned from this study, how confident can we be in the findings and how might they be reported? In this book, we present this in terms of reporting the study (Chapter 7) and delivering the highest possible quality research (Chapter 8).

1.2 THE SPACE OF INTERPRETIVE QUALITATIVE STUDIES IN HCI

There are several important dimensions on which qualitative studies in HCI vary:

- **The focus of the study:** Qualitative studies in HCI, by definition, focus on current or future technology design and use. But there are still many possible questions that the study might address—e.g., "how does our new design compare with our competitor's design?" or "what are the privacy implications of introducing this new technology?"

- **Who provides the data:** Most studies involve the current or intended future users of the system of interest. Occasionally it is necessary to work with surrogate users—e.g., when real users are too busy to take part, or too expensive to recruit. Many studies also involve stakeholders in the system, such as domain experts who understand at least some of the users' technology needs. In healthcare, for example, medical practitioners might provide input on system functionality they believe their patients need.

- **Where the data is gathered:** For many studies, particularly observational ones, it is important to do the data gathering in the "field"—i.e., in the real world, where the technology will be used in practice. But interviews may be conducted away from the situation of use, and think-aloud studies that focus on the individual's interaction with a specific system often take place in controlled ("laboratory") settings.

- **How the data is gathered:** Most studies gather data through observation, interviews, focus groups, or diaries. Some studies use existing data such as incident reports, product reviews or system documentation.

- **How the study is structured:** Some studies have a clear stepwise structure, from devising research questions, to gathering data, to counting responses and producing results; others are more exploratory and iterative, which can include interleaving data gathering and analysis, as they refocus questions and find more meaning as they engage with the data. This is discussed in more detail in Chapter 6.

- **The relationship between the analyst and the data:** Some studies presume an objective reality to be "out there," and so two independent people can analyse the same data and discover the same conclusion; other studies recognise the role of the researcher in shaping the analysis and creating a narrative. We discuss positivist and interpretivist traditions that underlie these positions in more detail in Chapter 6. Throughout this book, we focus primarily on the interpretivist tradition.

This makes it sound as if there is enormous scope for variability. In practice, every study needs to be coherent: the approaches to gathering and analysing data need to be well suited to the research question, as discussed in more detail below.

In the following chapters, we expand on these themes to help you plan, conduct and report on your qualitative HCI study. Planning a study can seem overwhelming at first, but a focus on the purpose of the study, together with the courage to commit to early writing and to just getting on with things, can quickly make things seem more manageable.

In this book, we use the term "Semi-Structured Qualitative Study" (SSQS) to talk about the kinds of studies that are most commonly conducted in HCI. This term draws on the analogy of the semi-structured interview: that there is structure to give accountability and rigour while also creating space for exploring important avenues that are discovered through the process of doing the study. SSQSs occupy territory between studies that are based primarily on the analyst reporting their understanding of a situation in a free and unstructured manner and studies that are very structured in their approach and analyses. Our main reason for introducing this term is to add clarity to this area and to succinctly describe the kinds of study that are the focus of this text. It covers several different detailed approaches to qualitative studies in HCI. The key commonalities across these studies is that they have some clear structure that can be externalised.

1.3 OVERVIEW OF TOPICS

We found it difficult to choose an order for topics in this book, because everything is related to everything else. You cannot plan a study until you have some sense of what is and is not possible given the resources, constraints and context of that study. These considerations will include many factors such as who you can recruit and the intended size and scope of the project. Drawing on our film analogy: a major studio film is normally put together by many people working as a team, and each has an important role; however, independent films and documentaries are made on much lower budgets and can sometimes involve just one person doing the work. Documentaries do not need to be full feature length but can be short forays into a topic of interest. Qualitative studies can also differ in size and scope but the typical qualitative HCI study has a very small team (often only one or two people) and they have to play multiple roles—as producer, director, editor, etc.

The producer is involved in a lot of work in terms of the finances and contracts behind the film before any work begins, and then the film distribution once it has been created. Securing finances to realise a project can be difficult. In terms of research, these activities are likely to have been done by the project's Principal Investigator or your supervisor prior to any work on the project. We do not include those phases here but they are often key to making research possible.

The first role we consider is that of the director, who directs the making of the film and is responsible for achieving an artistic vision within budget: being creative to deliver a high quality product while also working with the available resources and constraints. Documentaries with human subjects may also include ethical considerations. In Chapter 2, we discuss the overall planning of a project, including the management of ethics and informed consent in studies.

A documentary relies on the footage it gathers of its subjects, e.g., this could be revealing interviews with key witnesses, capturing intimate behaviours of families or filming large mammals on the savannah. A scout might help find a location, and local guides might introduce suitable human participants, as part of pre-production for the film. Similarly, the quality of an HCI study can stand or fall on the data that is gathered which, in turn, depends heavily on the recruitment of participants to the study. In Chapter 3, we discuss sampling strategies and recruiting participants.

Of course the camera crew and sound technicians play a critical role in gathering footage under direction of the director. Capturing good quality data is essential, unless you are working with archive footage in which case you need to source it and review its quality. In Chapter 4, we discuss techniques for gathering data, including approaches to observation, interviewing, and getting participants to provide their own data (e.g., by keeping a diary).

The role of the editor becomes important at the point where the raw footage is selected, cut and joined together to create a coherent and compelling narrative that is faithful to the situation being documented. The editor might put the film together to highlight compelling themes that draw the viewer in or help them understand the topic in a new way. Just as the role of the editor is central to the quality of a documentary, so analysis is fundamental to the quality of a qualitative study. Approaches to analysis are discussed in Chapter 5.

Just as there are many different practices for putting together a documentary film, so there are many different approaches to qualitative research. We allude to many of these differences throughout the book, and in Chapter 6 we explicitly discuss different approaches, including Contextual Inquiry, ethnomethodology, GT and mixed methods approaches.

The final step of editing is creating the final cut, the finished film that is ready for viewing. The reporting should be credible (making it clear what the quality and limitations of the work are) while also being engaging. In Chapter 7, we discuss ways of reporting findings from a qualitative study.

For stakeholders in the production, the story does not end the moment the film is released. The film will be viewed, assessed and critically reviewed. Similarly, the report of a qualitative study

will be assessed (e.g., the dissertation will be marked, the paper reviewed or the client report assessed by the client). In Chapter 8, we discuss the thorny question of how to evaluate qualitative research. This includes issues like validity, transferability and generalisability; different forms of triangulation; creativity and insight. Although Chapter 8 comes near the end, the issues are ones that should be considered from the outset, in the planning and conduct of the study.

This is a short book, where we present an overview of topics. However, we hope that you will enjoy your forays into qualitative HCI research and will want to learn more. In the final chapter, we summarise resources for going further.

Figure 1.1: Documentary films are different from fictional films in that they aim to present and document some aspects of life and reality, and further our understanding of their chosen subject. Like qualitative research, there are interesting questions about the techniques, practices and processes of representing facts while engaging and informing an audience. We go behind the scenes in this book to explore these issues.

CHAPTER 2

Planning a Study

THE DIRECTOR'S WORK

The art of devising any study is to match up what you are trying to achieve with the methods and resources at your disposal. While the film director may have a fairly blank canvas to work with, HCI is often about addressing pressing, practical problems or understanding future user needs. So a good place to start is with the purpose of a study.

Incidentally, most texts on qualitative methods do not start with the purpose: they typically start with a method, and then summarise (or leave the reader to infer) what that method is suitable for. We are taking a purpose-focused approach. From this perspective, the choice and application of an approach or technique are not right or wrong, but they are more or less well suited to the purpose of the study, and the aim is to select and adapt methods to be as good as possible for addressing that purpose. In Tables 2.1 and 2.2, we summarise some of the key features of the techniques and approaches covered in this book (see Chapters 4 and 6).

HCI is often problem-focused, delivering socio-technical solutions to identified user needs. Within this, there are two obvious roles for Semi-Structured Qualitative Studies (SSQSs): understanding current needs and practices and evaluating the effects of new technologies in practice. The typical interest is in how to understand the world in terms that are useful for interaction design. This can often demand a "bricolage" approach to study design, adopting and adapting methods to fit the constraints of a particular situation. On the one hand this makes it possible to address the most pressing problems or questions; on the other, the researcher is continually having to learn new skills, and be open to new possibilities. Experience with qualitative projects and techniques will bring a maturity that will make these possibilities and adaptations easier to handle.

Table 2.1: Key features of techniques

Techniques	Features	Suited for	Considerations
Observation	Observing people working (or performing other activities) and interacting with technologies	Gaining an understanding of what people really do in practice	Without complementary interviews, it can be difficult to make sense of what is observed
Think-Aloud	Users talking through thoughts while interacting with a system or solving a problem	Understanding how people perceive and experience a system, and how they use it to support their work	Requires access to system. Data focuses on the system rather than the broader work context
Semi-Structured Interviews	Interviewing people about their work, their experiences of technology, their hopes for future technology, etc.	Gathering people's perceptions and experiences	People have difficulty reporting accurately on what they do
Focus Groups	Facilitating a group discussion, most commonly between people with similar backgrounds about the theme or technology of interest	Gathering perceptions and experiences, often with greater breadth but less depth than interviews	Focuses on perceptions rather than actions. Risk of "group think" unless carefully managed
Diary Studies	Participants maintain a diary of relevant actions, experiences or thoughts	Longitudinal data gathering that is situated in the context of use	May be fairly superficial unless participants have a high level of commitment
Autoethnography	Researcher participates in the intervention and maintains a diary of actions, experiences and reflections	Researcher gaining empathy with participants and with others who experience the intervention	Highly subjective, and probably not representative of the user population
Working with Existing Sources	Using existing sources (video, social media, audio, text…) as data for addressing the research problem	Building understanding based on background material	Data was generated for a different purpose and audience, so may not be directly suited to the current research question

Table 2.2: Key features of approaches

Approach	Features	Suited for	Considerations
Theory-Shaped Study	The design of data gathering and/or analysis is informed and constrained by the selected theory	Testing or extending theory; gaining insights into design or evaluation of system from the selected theoretical perspective	May overlook important considerations that are not covered by the theory
Ethnomethodology	Data gathering and analysis shaped by the ethnomethodological focus on how workers perform and "make sense" of their work	Gaining insights for design based on how people work and make sense of their work	May overlook important considerations that are not covered by the approach
Contextual Inquiry	Data gathering and preliminary analysis shaped by the constructs and questions of CI (information flow, artefact use, etc.)	Gaining insights for design based on information flow, how current artefacts are used, etc., within work	May overlook important considerations that are not covered by the CI models; not suited to mobile settings
Participant Observation	The researcher participates (to a greater or lesser extent) in the setting being studied	Getting immersed in the activity and experiencing something similar to what others experience in that situation	It is not always possible to participate meaningfully in the activity; requires reflexivity to understand one's own role in the situation
Action Research	Involves an intervention—e.g., introducing a new technology or process—and studying the effect of that intervention on work and user experience	Introducing innovations into the situation and understanding their effect on practice	Can be difficult to discern the effects that are attributable to the intervention; requires reflexivity
Grounded Theory	Involves interleaving data gathering (usually interviews) with analysis; focuses on systematically developing theory in its strongest form	Developing new theory from data	Depth of analysis may be disproportionate for small studies

2.1 SO, YOU'VE GOT THIS GREAT IDEA OR BURNING QUESTION…

Every study has a purpose. As noted already, within HCI there are two main roles for qualitative studies: the first starts by trying to understand people's needs and the context within which a future technology might be used; and the second starts by assessing how well an existing technology is working and the effect that it is having on the people and the context. There are three common areas to focus on in HCI studies, as summarised below (see also Figure 2.1).

1. **How people exploit technologies to support cognition** (e.g., Hutchins 1995; Attfield and Blandford, 2011), or developing theories of emotion, cognition and interaction to inform design (e.g., McCarthy and Wright, 2005; Schneider et al., 2016).

2. **How a particular kind of technology shapes people's experiences** (e.g., Palen, 1999; Kindberg et al., 2005). This includes ways in which a new product changes attitudes and behaviours and how the design of the product might be adapted to better support people's needs and aspirations.

3. **The nature of particular "work"** (where "work" might be a leisure activity, paid work, home work or voluntary work), and how interactive technologies support or fail to support that work (e.g., Hartswood et al., 2003; Hughes et al., 1994; Mentis et al., 2013).

Figure 2.1: People use technology to achieve "work" (broadly conceived). The focus of HCI studies might be on or between any of these components.

Some (e.g., Crabtree et al., 2009) argue that the only purpose of an ethnographic study in HCI is to inform system design. Others (e.g., Dourish, 2006) argue that designers need a rich understanding of the situation for which they are designing, and that one of the important roles for ethnography is to expose and describe that context for design, without necessarily making the explicit link to implications for design. The best designs are usually ones where the design team has a rich understanding of the intended users of their products. We are often reminded of the power of intuitive design (e.g., Moggridge, 2007), but when the design team cannot have good intuitions about their users, they need other means to put themselves in the user's shoes. Rich qualitative studies describing people, technology and work have a valuable role to play in HCI: in particular, for the design and evaluation of technology, agenda setting, theory creation and critique of predominant design paradigms.