# Fieldwork for Design.

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## The Tutorial: Outline - A Tutorial In Three Halves

- 1. Ethnography - what it is and how to do it, fieldwork, analysis & theory
- 2. Some examples - understanding 'failure'; understanding 'trust'
- 3. Developments in ethnography - new settings and complementary methods - 'cultural probes'
- 4. Maybe a quick look at ethics..
- 5. Tutorial booklet..slides and website



## Ethnography Website

- http://www.comp.lancs.ac.uk/computing/users/rouncefi/Tutout.html
- Tutorial Outline & Slides - CSCW etc
- CSCW Tutorial
- Sections - Theory, Practice, Online Papers, Practical Issues, Ethnography & Design, Developments in Ethnography, Ethics. Annotated Bibliography
- ../Ethnowebstuff/Tutout.html

## Ethnography & System Design: The 'Social Turn'

- How did ethnography get so popular?
- Understanding system failure - London Ambulance; Taurus; Ladbroke Grove etc
- Lucy Suchman - 'Plans & Situated Actions'
- The importance of social factors - the need to seriously consider social factors in system design
- 'Taking Users' seriously - 'becoming a user' (Becker)
- System design as interdisciplinary



## Ethnography - Research Practice - 'don't think but look'.

- Ethnography -emphasis on **describing** the social activities of work
- focuses on how people **actually** order their activities through mutual attentiveness to what has to be done
- **'turn to the social'** in systems design - **importance of social factors**
- Introducing information systems and the electronic delivery of services **has to be understood as a business, not a technological, issue.**



## What is Ethnography?

- Ethnography is one kind of fieldwork
- Ethnography is naturalistic
- Ethnography is prolonged
- Ethnography is immersive- describe work as the skilful and socially organised accomplishment of parties to it.

## The Dead Hand of Fame - 'Types' of Ethnography.

- **There are no 'types' of ethnography - just ethnography done under different circumstances and used in different ways.**
- **'Concurrent ethnography'**: - on-going ethnographic study taking place at the same time as systems development.
- **'Quick and dirty ethnography'**:- to provide a general but informed sense of the setting for designers.
- **'Evaluative ethnography'**:- to verify or validate a set of already formulated design decisions.
- **Re-examination of previous studies'**: - to inform initial design thinking.



## Concurrent ethnography

- sequenced process in which the ethnographic investigation of a domain precedes the design development of the system.
- thorough insight into the subtleties rooted in the sociality of the work and its organisation.
- declining rate of utility for the fieldwork contribution to the design.



## The Name That Haunts Us All - 'Quick and dirty' ethnography

- provides valuable knowledge of the social organisation of work of a relatively large scale work setting in a relatively short space of time,
- 'pay off' is greater in that for time expended on fieldwork a great deal is learned.
- knowledge can be built upon for a more focused examination of the detailed aspects of the work
- provides broad understanding which is capable of sensitising designers to issues which have a bearing on the acceptability and usability of an envisaged system rather than on the specifics of design.
- capable of providing an informed sense of what the work is like in a way that can be useful for designers in scoping their design

## Evaluative ethnography

- a more focused version of the ‘quick and dirty’
- does not necessarily involve a prolonged period of fieldwork
- directed at a ‘sanity check’ of an already formulated design proposal
- used in evaluating a design.



## Re-examination of previous studies

- new approaches, new methods, new systems not only challenge existing methods and approaches but also lack experience and a corpus of case studies which can be used either as sensitising material or in informing preliminary design.
- especially useful where obtaining sight of general infrastructural CSCW principles is the prime goal.
- a way of sensitising designers to social character of settings
- performs a useful role in making designers aware of what to avoid and what the more specific issues might be.



## Lessons:

- **A variety of roles for ethnography in design**
  - ethnography has a role to play in various phases of system design and makes different contributions to them
- **Responding to the pressure of time and budget**
  - fieldwork of prolonged duration is not always necessary
- **The importance of focus**
  - Successful ethnography is ‘focused’
- **The importance of previous studies**
  - contribution toward informing ‘good practise’ in CSCW design.
- **System and work design**
  - system design is work design
  - understanding the context, the people, the skills they possess, what kind of work redesign may be involved etc., are all important matters for designers to reflect upon

## The Functions & Problems of Fieldwork

- Some obvious problems:
- Time and Cost - ethnographers are cheap but ethnographies take time
  - integrating the study
- The 'in the head' nature of some data - what if the fieldworker gets run down by a bus?
  - representing what you know
- The distributed nature of some data - defying the laws of space and time
- The problem of formalisation
  - data can be 'messy' - making amessy world tractable to design



## The Functions of Fieldwork

- Establishing a corpus
- 'sensitizing' designers
- 'informing' requirements
- analytic complementarity
- evaluation



## The Problems of Fieldwork- Access

- a cluster of problems
  - gaining entry to the work setting,
  - gaining acceptability,
  - being able to 'hang around"
  - problems arise from sponsorship by vested interests.
  - 'sacred' and 'profane' areas
  - gatekeepers and reverse gatekeepers
  - 'open' or 'clandestine' study.

## The Problems of Fieldwork - Fieldworker Roles

- the ‘expert’ v. the ‘novice’ v the ‘idiot’
  - ‘wasted time’ v. analytic independence
  - the former requires someone who knows the domain
  - the latter requires someone comfortable with their own lack of understanding.
  - subjects become aware of the fieldworker’s developing expertise
  - ‘going native’.



## The Role of the Fieldworker 2

- distinct psychological phases:
  - ‘everything’s really interesting’
  - ‘I don’t think I’ll ever understand this’
  - ‘ah .... right ....’
  - ‘this is really boring’
  - ‘I’ve not seen that before’
- accept the hours and conditions
- non-intrusive demeanour but not self-effacing. e.g. dress codes



## The Problems of Fieldwork - Focus of the Study

- the ‘innocent’
- ignore design concerns initially ?
- nothing is too trivial
- everything happens more than once
- dialogue between the ethnographer and the designer.

## The Problems of Fieldwork - Data - What to record

- anything and everything
  - conversation, movement, interviews, opinions, mysteries, unusual stuff, ‘how they know what they know’, different granularities
- notes are incomprehensible on their own
- become progressively more organised to ‘show something’
- data becomes ‘examples’



## The Problems of Fieldwork - Asking Questions

- Don’t be a purist
- Knowing what questions to ask
  - subjects will provide relevant responses on the basis of what they know about the person asking the questions. - Don’t take answers too seriously early on.
- Discretion is important.
  - 'don't frighten the horses.' - don’t ask at the wrong time
- Don’t get obsessed with method.
  - Reliability and validity are not that important- nor is ‘generalisation’
- Don’t aggregate responses
  - understand the significance of different responses



## The Problems of Fieldwork - Getting Bored - Duration of the Study

- Distinguish between routine and exceptional.
  - what problems occur, how frequently, and what their significance is, how they are dealt with and with what degree of 'competence'
- no self-evident completeness rules, but
  - a. the flattening of the learning curve
  - b. Knowing what you haven't seen is a further test.

## The Three Second Ethnography

- The girl on the bus..



## Ethnography & The Analysis of Data

- The following analytic devices have been useful to us
- they strongly associate with *our* way of doing things
- they can be disposed of at will
- We wont be blamed for your failures.. even if it is our fault



## Analysis of Data - The Ecology of the Workplace

- preamble to other analytic work. - easily made visual
- illustrative of the way in which space must be organized in order that work can be effectively organized within the constraints of the current system.
- *"the most commonly used materials, unsurprisingly are kept 'to hand'. Significantly, and for the same reason, each cashier position is surrounded by notes stuck to walls, etc. which contain 'at a glance' information, most of which relates either to various codes for use with the system, or to information which customers commonly seek."*

## Analysis of Data - The Flow of Work

- Not Workflow - Describing the work with all its contingencies
  - Orientation to Procedures
  - The Egological Principle
  - Social Organization of Work
  - Skills and Expertises



## Orientation to Procedures

- 'Mind the Gap'- procedures …and their application.."telling lies to the machine"
- Customers are unpredictable - work has to be done to manage them
- Configuring the customer



## The Egological Principle

- 'What must I do next' questions
- How work is organised by the person doing it
- e.g. weaving interaction and technology

## Social Organization of Work

- Awareness of what others are doing
- Example from Ethnographic Report
  - Cashier 1: "What do I do about this account? ... its got nil written on ... you can't open an account without any money in it, can you? ...."
  - Cashier 2: "its Mr .... just put it to one side until he pays the £100 ... he's got over £30,000 in his other account ... don't actually open the other account, just hold it ...."
- Ethnography contrasts with Workflow Analysis



## Skills and Expertises

- process outcomes are not entirely a function of the technology
- skills are often unrecognised
  - local knowledge - The 'semi- codified' form - 'bibles' - the 'Mavis' phenomenon
  - obstructions to problem solving - skills compensate for inadequacy of technology
  - problems with technology may not be visible - e.g. reluctance to use 'help' facilities
- The limits of skill- training
- eg. Demeanour work- 'keeping the customer satisfied'; skill & the moral order



## Dull Technical Stuff - Technological support- Video 1

- sound reasons for video analysis .
- data can be analysed by anyone. ie. It is replicable and permanent.
- valuable when trying to get a sense of often repeated activities
- provides for attention to detail (eye movement, gesture, etc.)
- Valuable in:
  - fixed locations; where children are involved..BUT..;here no-one has time to stop and explain; where subjects are unknown or transitory; where you might want to play back your data to participants to the interaction to test your worldviews against theirs; here you want to 'time' events.

## Technological support- Video 2

- Problems which arise:
  - it can be unreliable… it can be guaranteed to be unreliable
  - requires a familiarity with its functionalities
- 'domain' problems.
  - not welcome in areas where mobility is needed, or there are confidentiality anxieties
- 2. Background noise.
- 3. Hours and hours of tape.
- 4. Presence and absence - leave it there or stay with it?..obsessing over video



## Audio Tape recording

- less intrusive than the video but provides less 'rich' data.
- useful to record long explanations, especially those of a highly technical or domain specific kind
- It is a useful device for speaking into ie. use it as a resource for noting ideas.
- For the most part it is unobtrusive.



## Audio Tape recording

- Problems which arise:
- Early on, people will notice, and even object to tape recording.
  - ceases to be a problem in practice very quickly.
- Permission should always be sought.
  - never be a hostage to loss of trust.
- tapes need transcription.
  - a more serious problem with audio tape than with video tape, perhaps as a feature of 'bandwidth'.

## Computer Support for QDA

- Ethnograph, Nudist etc
- DON'T BOTHER - 'just say "NO"



## Problems with QDA

- Codification and indexing are fraught with difficulty
- Packages tend to do the analysis for the researcher
- mechanical organization of the data, refinement of the text- privileges the record as a comprehensive account
- 'Conceptual work' is constrained by the assumptions of the package



## Ethnography - A Limited Conclusion

- the design of computer systems is the design of work and the organization
- A comprehensive and inclusive definition of 'system' is required
- Sanity testing - Organizational Knowledge - 'plans' are necessary but not sufficient
- analysis of work is more than mere description - 'scenic' ethnography

## Ethnography & The Analysis of Data - The Burden of 'Theory'

- A list of theories…theoretical auspices of data collection - Participative Design; Activity Theory; Grounded Theory; Ethnomethodology; Distributed Cognition; 'Soft Systems'; Business Process Re-engineering
- Close encounters with difficult words - ethnomethodologically informed ethnography
- ***'any group of persons - prisoners, primitives, pilots or patients - develop a life of their own that becomes meaningful, reasonable and normal once you get close to it, and .. a good way to learn about any of these worlds is to submit oneself in the company of the members to the daily round of petty contingencies to which they are subject.'*** **(Goffman, 1961: ix)**



## Ethnomethodology

- ***'to treat practical activities, practical circumstances, and practical .. reasoning as topics of empirical study, and by paying to the most commonplace activities of daily life the attention usually accorded extraordinary events, seeks to learn about them as phenomena in their own right'*** **(Garfinkel 1967)**
- **".. Some day you're gonna have to face the deep dark truthful mirror" Elvis Costello**



## Ethnomethodology - the ethno 'take' on technology..

- "That's a funny kind of thing, in which each new object becomes the occasion for seeing again what we see anywhere; for example, seeing people's nastinesses or goodnesses, when they do this initially technical job of talking over the phone. **The technical apparatus is, then, being made at home with the rest of our world**.
- And that's a thing that's routinely being done, and it's the source for the failures of technocratic dreams, that if only we introduced some fantastic new communication machine the world will be transformed. Where **what happens is that the object is made at home in the world that has whatever organisation it already has**." Harvey Sacks (1972)

## Ethnomethodology & Ethnomethodologists (support an endangered species..)

- Ethnomethodology - takes seriously the great question of Sociology - 'how does social life get organised?'
- Ethnomethodology = data driven Sociology
- Ethnomethodology refuses to theorise - it has no work for theories to do.
  - an 'unmotivated' approach to the witnessable and varied activities .
- Ethnomethodology does not offer explanations but explication
  - Ethnomethodological findings - descriptions of the embodied social practices in and through which members produce and accomplish the daily activities of the setting



## What Do WE Want A Theory For?

- What 'work' does theory do? Who does it 'work' for?
- 'Theory in CSCW should provide a conceptual framework that helps us make sense of and describe the world. This includes describing a work setting as well as critiqueing an implementation of technology in that setting. Second, we need rhetorical power. Theory should help us talk about the world by naming important aspects of the conceptual structure and how it maps to the real world ... The third attribute is inferential power... In some cases those inferences may be about phenomena that we have not yet understood sufficiently to know where or how to look. We may hope that inferences will lead to insights for design. Or we want to predict the consequences of introducing change into a particular setting. An important fourth attribute has to do with application: how we can apply the theory to the real world for essentially pragmatic reasons. We need to describe and understand the world at the right level of analysis in order to bridge the gap from description to design.'



## The 'Work' of Theory

- Halverson 4 basic needs in interdisciplinary work: descriptive power; rhetorical power; inferential power; and application.
- The problem is the problem of *relevant* description, inference, rhetoric and application, and how we go about deciding them. Can theory provide us with the answers?.
- 1. What is our choice of setting to be and how (and by whom) is it to be determined? Can theory help us choose?.

- 2. Which behaviours and technology uses in the setting turn out to be interesting? Does theory provide us with a conceptual framework for deciding which artefacts are the relevant artefacts, and which patterns of use we should be attentive to.
- 3. What level of detail might be required of us, and for what purpose? Can theory result in *positive* and relatively *definitive* statements about applicability, rather than the kind of 'cautions' typical of ethnographic results.
- 4. What pattern of regular and unusual events should we be attentive to? Can theory tell us, in advance which activities are important. Does theory help us answer the kinds of 'what if?' questions that designers are prone to ask, ..



# Ethnography & Interdisciplinary Design

- Ethnography must be adequate to interdisciplinary tasks.
- In CSCW - emerging set of tools and assumptions used to evaluate and comment on matters of empirical adequacy, scope, relevance, tractability ..
- Include the following assumptions and views about fieldwork-for-design.



- 1. Fieldwork-for–design requires researchers to be *ethnographic* in their approach - being familiar with what to look for in terms of themes, topics, and issues, knowing how to explicate aspects of the observed setting.
- 2. Fieldwork-for–design is based on knowledge of prior design-oriented fieldwork – on an *analytic sensibility* for fieldwork-in-design.
- 3. Fieldwork-for–design produces evidence of a *particular kind.* The way the fieldworker in design looks, what they look for, what they capture, is wrapped up with their design motivation. There is no inevitable separation between data and design..
- 4. The kind of materials produced help create a *space for design thinking*. Takes different forms, narratives, stories, pictures, patterns..
- 5. Fieldwork-for–design should be thought of as essentially a *collaborative affair*, part of an overall process of team-based activities.
- 6. Fieldwork-for–design requires an *iterative* and dynamic approach to the role and position of fieldwork in the overall design process.

## Ethnography Tutorial Part 2.

- 'New' settings for ethnography - the home
- Some examples - understanding 'failure'; understanding 'trust' - movement away from and more subtle than 'understanding work'
- Examples of importance of 'focus'; expertise etc
- Examples of use of video and photos



## Ethnography and Domestic Settings

- Commercial auspices of the work
- The high tech. nature of the house itself.
- Digital video was used
- Some of our terminology was used specifically because our clients for this study were familiar and comfortable with terms such as enablers and inhibitors.
- Regular informal interviews were held.



## **Positioning in Literature.**

- 1st (?) study of people actually inhabiting a Smart House
- What is a Smart House?

A Typology

1 *Contains intelligent objects*
2 *Contains intelligent, communicating objects*
3 *Connected home*
4 *Learning home*
5 *Alert home*

## *Early concept formation- enablers and inhibitors.*

1. *Individual v. collaborative activity*
2. *Usefulness/fitness for purpose*
3. *Connectivity/Information use*
4. *Ease of Use/ usability*
5. *Personalisation*
6. *Overhead*
7. *Bandwidth/Multimedia affordance*
8. *Location*
9. *Trust/reliability*



## *More general headings.*

1. ***control***
2. ***social connectivity***
3. ***location***



## Control

*'I always read in bed, and it's nice to just reach over and switch the lights off. Same in the morning- I have trouble getting up- it's lovely to be able to open the curtains from bed.'*

negative sentiments:

overhead

robustness and reliability

lack of control.

## *Control*

*'Things must be simpler to do than in a normal house … I don't want to work through a menu just to turn off the lights. Again, I hope this will be improved with voice control', and, 'It should never take longer than it did before. Keep it Simple'.*

*'I felt that there was a real risk that people would get locked out. In fact, while I was there the kids got locked out in the garden because there are no door handles on the outside of the patio doors in the kitchen.'*



## ***Social connectivity***

*'privacy' versus 'connectivity' issues that are central to family :*

*'I need to keep an eye on Peter, who has a bit of a tendency to run off'.*

*popularity of 'surveillance' technologies like the baby monitoring equipment in the house.*

*'The kids liked the fact that you could watch TV and use the computer on the same screen- they could switch from one to the other. In fact, though, the kids watched a lot of TV in the adult bedroom on the Home Entertainment System … because of the screen quality. All three of them would be in there playing with the bed settings and watching films … We did find we were rather less likely to watch as a family'*



## ***Distance Connectivity***

Direction of information flow important:

*'We started off using it but it dwindled away. For a start, we're not as fit as we thought we were. I'm not a hypochondriac so I didn't really need the help. We didn't get any feedback from them in any case- perhaps that should be reassuring- the nurse was very thorough when she came round- if you actually had some condition it would be very good. The nurse suggested we did it every day, but we didn't … just occasionally. It wasn't really for us. To be honest, I just didn't like it … I don't like being constantly monitored …'*

## *Distance Connectivity*

enthusiasm for any technology which allows them to be connected more widely, especially to other family members

*'Net meeting would be a popular option with us. With the speed of the access here, and the bandwidth, that would be fantastic. Actually, the image quality isn't that important to us. I can tell enough. We can still see [our niece] growing up. Through Net meetings, our friendship networks have actually grown, like my sister now knows some of my other friends and will talk to them even when we're not logged on. With MSN you can send files more or less immediately, so you can look at photos and stuff like that.'*



## Ethnography, Dependability & Failure - the DIRC Project

"...how important it is to accept the reality of human fallibility and frailty, both in the design and the use of computer systems...all too often, the latest information technology research and development ideas and plans are described in a style which would not seem out of place in an advertisement for hair restorer." (Randell 2000)



## Understanding Failure

- problems in defining and measuring 'failure'
- Attributes of dependability:
  - availability (readiness for correct service);
  - reliability (continuity of correct service);
  - safety (absence of catastrophic consequences);
  - integrity (absence of improper system state alterations);
  - maintainability (ability to undergo repairs)
- consider the actual practice of a socio-technical system rather than any idealisation
- need to broaden our understanding of what dependability & failure means
- when we start considering people using a system, the notion of failure becomes more complex.

## Understanding Failure in Practice

- Interest in understanding failure - not necessarily explaining failure
- Comes from careful description and analysis of real time, real world system use
- Case studies:
  - directs attention to the means whereby people overcome 'everyday failure' through workarounds
  - highlights organisational responses to failure - raises and contextualises organizational issues concerning *management, scoping, coordination, timing, selection, prioritization, enforcement* and *agreement*
- **Abstract rules for dependability have to be applied within the real world**
- **Move away from 'failsafe' system - back to classic CSCW - "what to automate & what to leave to human skill and ingenuity.."**



## Dependable Red Hot Action

- **The setting - rolling mill:**
- **Rolling Plate:The process (idealised)**
- **Varies according to slab quality - eg whether sprays on ..**
- **Slab pushed from furnace through washers**
- **Aligned/centred**
- **Information on monitor - slab quality - present width and length - width and length needed - turning point - finish at.. how to roll**
- **Pre-broadside passes - sprays to remove scale**
- **Going for width - measurement - one red light= measuring, two its got width - green lights - turn to roll for length**
- **Turns and aligns**
- **Scheduler reduces gauge at each pass - until finish point**
- **Final roll is reverse - rolls lifted for passing on to FM - sprayed**



## Pulpit Controls


CSCW2006

## Rolling Steel Plate: The Roughing Mill

- The driver's view
- Slab is being centred and aligned
- Green light is on - turning
- Clock indicates the gauge

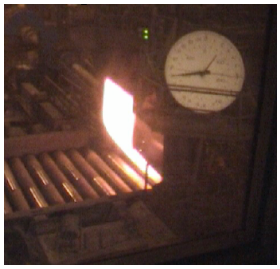
CSCW2006

## Rolling Steel

2006

# Problems:

- Turn-up - various shapes - 'cobbles'
- Badly shaped slabs - 'fishtails'
- Slab defects - from furnace - thermic shock etc
- Marking etc - influence quality of final plates
- Getting cold - more difficult to roll - especially in FM







# Problems

## Ensuring Dependable Production: coordination, planning and awareness.

- "An operator only operates the system rationally and effectively if each operation is carried out with a view to the necessary cooperation with others … he has to take into account the preceding, concurrent and immediately ensuing operations. (Schmidt 1994: 26)
- **Awareness: Slab Quality**
- **"its 233 quality which is the worst one for turn-up."**
- **"horrible plates these are .. from those Scottish bastards .. they've been turning up all night.."**
- Professional Vision:
- **" .. sometimes you can sit here and look at it and think, 'that one's going to be a bastard'"**
- **"Its Wednesday .. I'm thinking of the state of the rollers *(changed every Thursday)* ...they'll be hollow in the middle now.. this one will want to turn at 120 .. I'll do it at 118 .. that will offset the roller.."**
- ***Watching the clock* .. "the clock is out but only by about 3mm .. we use the clock because its easier to read .. we can anticipate the speed of the screw .. *(compared with head display)* .. if its going down in a pattern .. and it suddenly puts 15 on you know something's wrong.."**



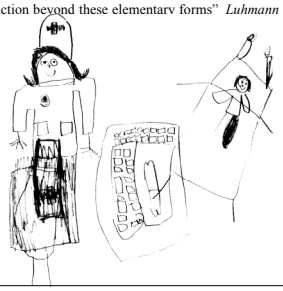
## Dependability, Plans and Planning:

- "Despite our attempts to automate an ever larger set of control functions, and to build-in forms of automated reasoning and intelligence into these computerised control systems, there is still a crucial need for human agency to monitor and, if necessary, to over-ride computerised systems under special circumstances or unusual conditions." (Rognin and Bannon 1997)



## Ethnography & Trust

- "Without trust only very simple forms of human cooperation which can be transacted on the spot are possible … Trust is indispensable in order to increase a social system's potential for action beyond these elementary forms" *Luhmann*



## Trusting the Technology

- **".. there is no relationship of trust with a computer" (Shneiderman 2000)**
- **"For most of us, most of the time, our natural attitude in the taken-for-granted world is one which enables us to maintain our sanity in our passage through life and the daily round. Routines, habits …and the consistencies with which our interactions with each other conform to expectations, together provide the infrastructure for a moral universe in which we, its citizens, can go about our daily business. Through learning to trust others we learn, one way or another, to trust things. And likewise, through learning to trust material things we learn to trust abstract things. Trust is therefore achieved and sustained through the ordinariness of everyday life and the consistencies of both language and experience." (Silverstone)**



## Trust & the 'real world' - what comes out of the field studies

- Need to pay attention to the *social process of trust production* - specify "the social mechanisms which generate trust ".
- trust as woven into the fabric of everyday organisational life - as part of the 'taken for granted' moral order (Garfinkel 1967).
- trust can be viewed as a product of and incorporated into everyday work - trust is an achievement.
- trustability a product of mundane, everyday work - interactional competences - knowing how to preface, repair, produce formulations, tell stories, develop scenarios..



## Trusting Technology: Trust & Expert Systems

- Detailed study of use, including how readers make sense of the CAD tool's behaviour
- R2 Characteristics 1.
- **Performance characteristics**
  - Targets ill-defined and spiculated lesions in addition to calcifications.
- **Prompt characteristics**
  - Calcification clusters are marked by a shaded triangle.
  - Ill-defined lesions are marked with an asterix
  - A circle is drawn around either prompt type if the system's confidence is high.

**The ImageChecker® is Easily Integrated into your Normal Clinical Workflow**

**1** Input films into the R2 Processing Unit. The digitized films are automatically processed by the R2 proprietary neural network algorithms.

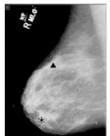
**2** Place the current and prior films on the R2 Motorized Viewer. The films are conventionally displayed for viewing by the reading radiologist.

CSCW2006

**3** Read the mammograms as you normally do, looking for signs of cancer, and make your interpretation.

**4** Display the ImageChecker® output images by pressing the one-button display activator. The ImageChecker® displays its search results on small monitors located just below the mammograms. It does *not* mark the original film.

**5** Review the ROIs displayed on the ImageChecker's® monitors. Compare these "road map" images with the original mammograms. Update your interpretation, if necessary.



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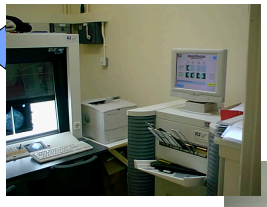


CSCW2006

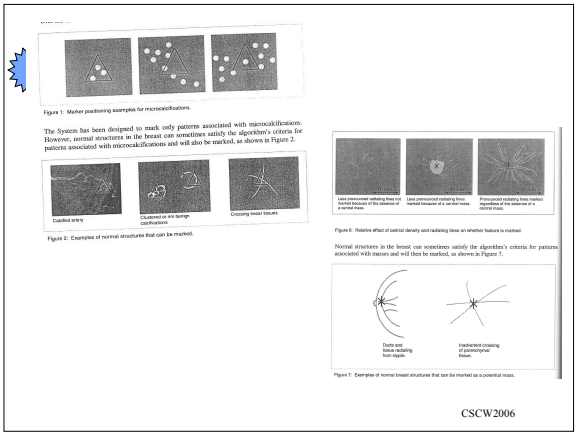


Figure 1: Marker positioning examples for microcalcifications.

The System has been designed to mark only patterns associated with microcalcifications. However, normal structures in the breast can sometimes satisfy the algorithm's criteria for patterns associated with microcalcifications and will also be marked, as shown in Figure 2.

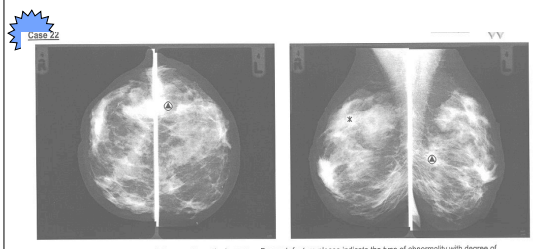
Figure 2: Examples of normal structures that can be marked.

Figure 6: Relative effect of central density and radiating lines on whether feature is marked.

Normal structures in the breast can sometimes satisfy the algorithm's criteria for patterns associated with masses and will then be marked, as shown in Figure 7.

Figure 7: Examples of normal breast structures that can be marked as a potential mass.

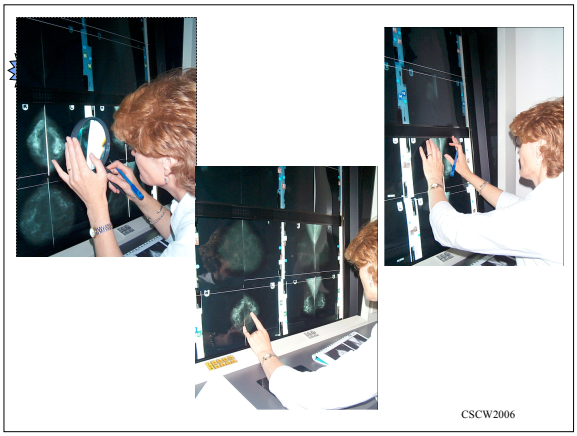
CSCW2006



Case 22

Please mark and number any areas of abnormality on the images. For each feature please indicate the type of abnormality with degree of

CSCW2006



CSCW2006

## Evaluation - what might cause readers to 'trust' or 'mistrust' the technology'?

- **Strengths**
  - **Picks up subtle signs and stimulates interaction** between film reader and the technology - "Those micros that the computer picked up .. I might have missed it if I was reading in a hurry .. I'd certainly missed them on the oblique.."
  - **If machine prompts made to look again** "This is a case where without the prompt I'd probably let it go .. but seeing the prompt I'll probably recall .. it doesn't look like a mass but she's got quite difficult dense breasts.. I'll probably recall.."
  - "This one here the computer certainly made me look again at the area.."
  - **Consistency** (trust?) - " .. its just the fact that its more consistent than you are .. because it's a machine.." (but threshold?)
  - **Interaction between R2 strengths and their reading strengths** & weaknesses



**Weaknesses**

- **Too many prompts** - "so many prompts .. especially benign calcifications .. you've already looked and seen there are lots of benign calcs.."
- **Prompting the wrong things** - benign, artefactual..
- "I'll not recall .. what the computer has picked up is benign .. it may even be talcum powder.."
- **Missing obvious prompts** - issues of trusting the machine
- Some of the obvious cancers were not prompted - **Computer detection does not always behave as expected** "That's quite a suspicious mass on the CC ..surprised it did'nt pick it up on the oblique.." (Points to area) "I'm surprised the computer did'nt spot it .. its so spiky .. I'd definitely call that back.."
- **Prompts as distractions** - "this is quite distracting .. there's an obvious cancer there (pointing) but the computer's picked up a lot of other things.."



## Interactive Bits

- Part 1: Traditional - questions and problems… any problems? Any questions?
- Have we persuaded you to become ethnographers? Ethnomethodologists? - what more would it take?
- Have we persuaded you to abandon theory? - what more would it take? How about becoming schizophrenic academics?

# Ethnography Tutorial Part 3

- Developments in ethnography - new settings and complementary methods - 'cultural probes'
- Ethnography now mainstream - now new settings and new technologies - movement of digital technologies out of the workplace brings with it the need to develop new techniques to consider how technology might relate to and support everyday activities
- Informed by new disciplines, new sensibilities?- art, architecture etc
- New approaches - probes etc - new approaches fro translating findings to design - 'patterns' etc



# Moving The Method On

- The 'turn to the social in design'…BUT.. how do you do it?
- Methods for identifying user needs in sensitive settings are not well developed
- Obdurate problems that make direct observation intrusive, disruptive and inappropriate
- **Developing new methods -** 'cultural probes'... Technology probes
- Major challenge for designers:
  "**… to pay heed to the stable and compelling routines of the home, rather than external factors, including the abilities of the technology itself. These routines are subtle, complex, and ill-articulated, if they are articulated at all ... Only by grounding our designs in such realities of the home will we have a better chance to minimize, or at least predict, the effects of our technologies.." Edwards & Grinter**



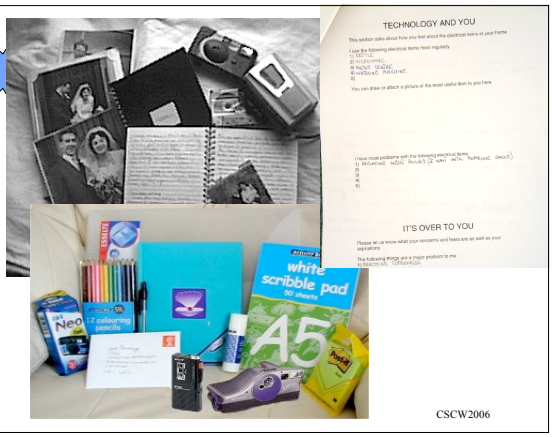
# Cultural probes: from inspiration to information

- Direct observation requires supplementation
- Cultural Probes - Gaver, Dunne & Pacenti- Presence project - 'inspirational' use
- There is nothing new about 'cultural probes'..
- Adapting Cultural Probes to open up communication channels and foster an ongoing dialogue with the members of our user groups
- Generate key insights into their unique needs.
  ***… offer fragmentary glimpses into the rich texture of people's .. lives. They allow us to build semi-factual narratives, from which design proposals emerge like props for a film***

## Cultural probe pack 1 - The Hostel.

- a disposable camera, photo album, visitors book, scrapbook, post-it notes, pens, pencils and crayons, a set of postcards addressed to the researcher, and a map.
- not explicitly 'designed' - present - modified over time
- instructions:
  *These items are Cultural Probes - but don't worry - they're just a way for us to find out more about you, your everyday life, what you think and feel. We'd like you to use them to tell us about yourself - and below are a few ideas you might want to think about. Ignore these if you like - nothing is compulsory - do as much or as little as you like. We hope its fun. I'll come back to collect them in about a week*



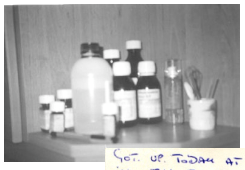


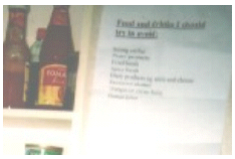


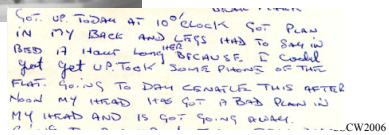

## Probe Results - Hostel - Abiding concerns

- Major preoccupations - medication; safety and security; communication
- Reveal 'temporal rhythms' of social life (Zerubavel 1985)
- Rhythms readily perceived - visiting rounds, movement of residents into, around and out of the site at various times of day, medication delivery, resident and staff meetings..
- Importance of knowing that events should happen in a regular and predictable order, what people were doing, and where they were...

## Abiding Concerns: Health & Medication










## Cultural probe pack 2 - the Climbing Club - serendipity & the 'ludic'.

- "Your mission, should you choose to accept it, is twofold. First, we would like you to document the various activities you participate in as part of your association with the climbing club
- *Sometime over the next two weeks you may wish to engage in some, all or none of the following playful activities. These are designed to help us get a sense of the less serious aspects associated with climbing and being a member of the climbing club. ...*
  - ∀ • *Take a photo of the smelliest boot in the climbing club*
  - ∀ • *Take a photo from the top of a climb and describe your feelings using the sound recording function on the USB camera.*
  - *Show us some video of cool moves on the climbing wall*



## Probe Results - Climbing Club - Abiding concerns

- The 'work' - plans and procedures; distributed coordination; awareness
- The 'community' - boundaries; relationships; change
- CASIDE website..

## Fragmentary Glimpses and User Requirements

- Supplementing ethnography in 'sensitive' settings
  - – providing access, beginning a 'conversation', from 'provocation' to 'reassurance'
- The problem of trivia… what is the data? - commonsense understandings.
- 'So what' - grounding design in the mundane world - avoiding stupid mistakes - moving from probes to design scenarios and design workshops
- Having modest expectations……& rethinking assumptions..
- *"They may seem whimsical, but it would be a mistake to dismiss them on that ground: for unless we start to respect the full range of values that make us human, the technologies we build are likely to be dull and uninteresting at best, and de-humanising at worst."* Gaver 2001.



## Ethnography Tutorial Part 4: Sif We Have Time - Some stuff on ethics..

- Why does computer design and use merit special ethical attention?
- Computers permit a novel range of behaviours that bring ethical principles into play – eg surveillance, privacy etc
- Complexity of computer systems makes the consequences of actions difficult to predict – (old ethical argument about science?) – can people be blamed for not being omniscient?
- Need for technical skills and knowledge – ethical debate is framed by what is technically possible – but – paradoxically - it is unlikely that there will be technical solutions to ethical problems
- Ethnography and ethics - the problem of close proximity



## Philosophy & Ethics

- Philosophy & Ultimate questions – the meaning of life, good and evil, personal identity, knowledge and certainty… etc
- Philosophy does not provide answers – philosophy as therapy – clearing the fog of confusion
- Ultimate questions – Plato, Bilbo Baggins and Miss Nude America (and Groundhog Day) - **Why be moral?**
- Issues of responsibility, safety, security, risk, trust – can be seen as ethical issues
- Ethics and positive action - not doing something is not a morally worthwhile option..?
- Choosing which ethical principles to defend..

## Ethical Responsibility & The Design Cycle

- Responsibilities as Researchers and Responsibilities as Producers-Workers
- Ethics as an academic and a practical concern
- Ethical issues and stages of research and development
- Initial research - Design - Deployment - Evaluation



## Ethnography, Research & Ethics & Nonsense

- "Whether anyone was harmed or inconvenienced by the research is the basic 'minimum question' of research ethics; did the researchers act responsibly, to leave the world no worse a place by reason of their investigation?" Sapsford & Abbott1992:25-26
- "... the sociologist should subscribe to the doctrine of 'informed consent' on the part of subjects and accordingly take pains to explain fully the object and implications of his research to individual subjects..."
  "In all circumstances, investigators must consider the ethical implications and psychological consequences for the participants in their research. The essential principle is that the investigation should be considered from the standpoint of all participants; foreseeable threats to their psychological well-being, health, values or dignity should be eliminated...."



## Computing Codes of Ethics - The ACM Code

- Series of Kantian Moral Imperatives
- General Moral Imperatives – (motherhood & apple pie?) - Contribute to society & human well-being
- Avoid harm to others - Be honest and trustworthy etc etc etc
- Mundane Ethics - Doing The Best You Can

# Practical Ethics: the bureaucratic and the bogus

- Bureaucratic - ethical protocols
- 'Bogus'
  - Informed consent
  - Anonymity
  - Privacy
- Moral cowardice as an ethical principle
- Ethical Issues in Design and Deployment - Understanding the consequences of interventions - care pathways, human rights, privacy etc - trying not to kill people
- Doing The Right Thing - Practical ethics - trying to behave like a decent human being…..whilst covering your ass...
- Don't be stupid