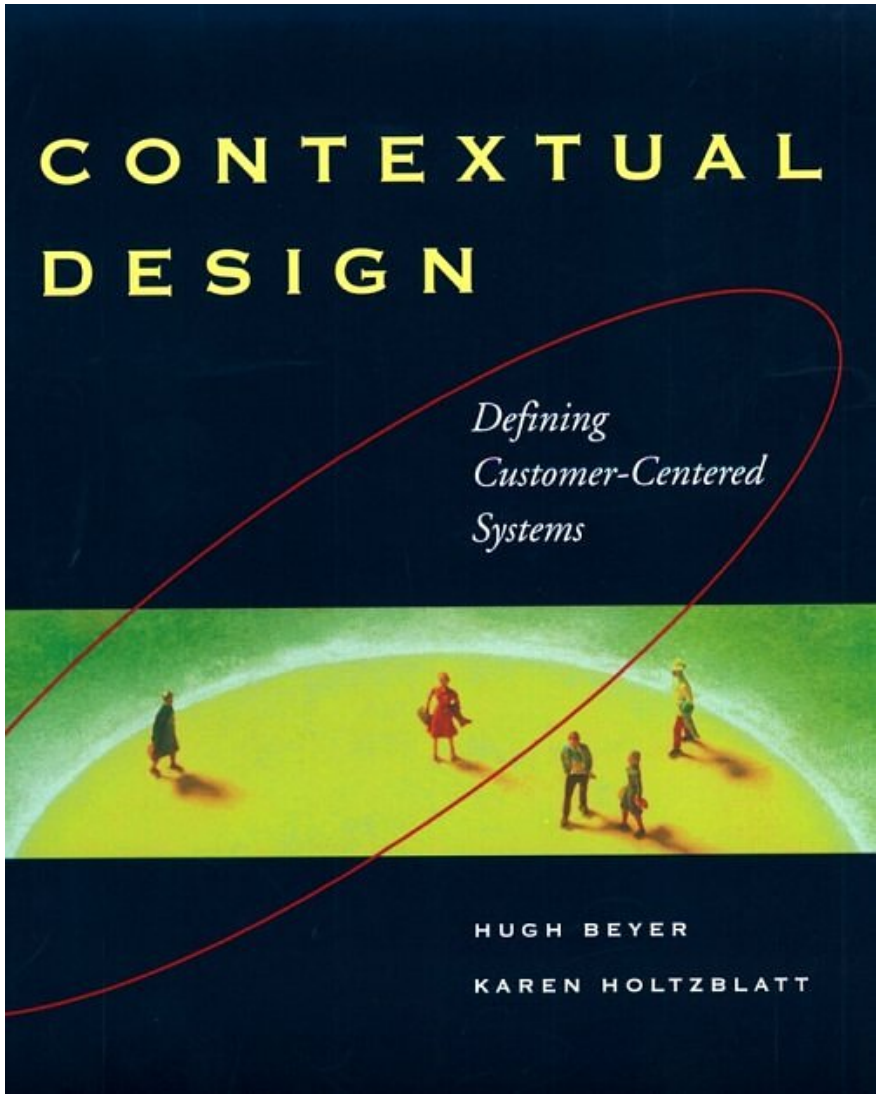
Contextual Design & Design Ethnography



Book by Hugh Beyer and Karen Holtzblatt

What is Contextual Design

- Structured method for **gathering** and **representing** information from fieldwork (such as ethnography)
- … to bring it into the design process

- Some call it an *ethnographic-based* approach
- Aspects relating to understanding user's work:
    1. Contextual inquiry
    2. Work modeling
    3. Consolidation

Contextual Inquiry

- An approach to ethnographic study where user is expert, designer is apprentice
- A form of interview, but
  - at users' workplace (workstation)
  - 2 to 3 hours long
- Four main principles:
  - Context: see workplace & what happens
  - Partnership: user and developer collaborate
  - Interpretation: observations interpreted by user and developer together
  - Focus: project focus to help understand what to look for

Seeing the work (1)

- Makes learning about it is easy
  - compare learning to use an application from a friend & learning from a manual
  - The following is from a user of a desktop publishing tool, “I’m entering edits from my marked-up copy … I’m working at 200% magnification so I can see how things line up. It doesn’t matter that I can’t see all the text in this magnification because I’m not checking for continuity or natural flow of words; I’ll do that in another pass later …”
  - B & H, 43

Seeing the work (2)

- Reveals what matters
  - "Once we observed someone sorting his paper mail. He was able to tell us exactly why he saved, opened, or threw out each piece because he was in the process of making that decision"
  - B & H, 43

Seeing the work (3)

- Reveals critical detail

  One customer said he would not use a manual's index to find a solution to a problem: "Its never in the index". He could not say what had lead him to that conclusion, what he had looked up and failed to find. (*tacit knowledge*) All his bad experiences were rolled up into one simple abstraction: it's not in there. But when we watched him looking things up, we could see that he was using terms from his work domain, but the index listed parts of the system. We learned what the problem was and what we could do to fix it.

  B&H, 44

Principle 1: Context

- See the work as it happens in the workplace
- Allows the analyst to experience the rich detail of work rather than the impoverished account of a summary
- Resist the temptation to summarise - staying in context allows us to understand ‘on-going experience’ rather than summary experience
- Contrast going to the movies with reading a summary

B& H, p47

- Secretary's answer to how she started her day: "I guess I just come in and check my messages and get started"
- Unable to provide additional information
- They asked her to go through her usual routine
- Her routine has a definite structure but this is invisible to her
- Summarising glosses over and loses key detail

- Speaking aloud as she went … “First I hand up my coat, then I start my computer. Actually, even before that I’ll see if my boss has left something on my chair. If he has, that’s my first priority. While the computer’s coming up, I check the answer phone for any urgent messages. There aren’t any. Then I look to see if there’s a fax that has to be handled right away. Nope, none today. If there were, I’d take it right in and put it on the desk of whoever was responsible. Then I go in the back room and start coffee. Now I’ll check the counters on the copier and postage meter …

Avoiding abstraction

- Focus on concrete data & tasks rather than generalised abstraction
- If people do insist on speaking generally … “We usually get reports by email …”
- Ask to see a concrete example &
  - When they arrive & how many
  - Are there quiet and busy days
  - Who sends them, what happens next to them

Principle 2: Partnership

- Create a sense of collaboration between you and your customer (the essence of User Centred Design)
- The only person who really knows their job is the person doing it
- Look for patterns and structures,
  Reflect back interpretations,
  Suggest early design ideas as they occur
  - allows genuinely user-centred design, since users can influence designer's interpretations of the work & ideas

Principle 3: Interpretation

- For design to take place, analysts must first interpret workplace data. For example …
- An accounting package user keeps a paper list of accounts & account numbers next to the screen. Why? What are the design implications?
  - Account numbers hard to remember: cross-reference names & numbers online?
  - Numbers are unnecessary legacy from old system: all that is needed is a unique identifier?
  - Need to maintain compatibility with paper system: keep numbers but allow names as well?
- Reflect interpretations back to user & *listen*

Practicalities of the contextual interview

- First 15 minutes - conventional interview
  - introductions, ground rules, permissions, overview of the job & today's work
- Explicit transition to contextual interview
- Contextual interview
  - notes & tape
  - be nosy, follow the interviewee
- Last 15 minutes - wrap up
  - summarise what you have learnt with the user
- Generally 2 -3 hours overall

CI: Different kinds of user tasks

- Normal, completed in a reasonable amount of time (e.g. installing software, writing a letter)
  - standard CI, audio tape, video rarely necessary
- Intermittent, unscheduled & brief, e.g. recovering from a system crash
  - get user to fill out a log of the event & save artefacts, then interview
- Uninterruptible, e.g. training session
  - videotape or good notes & review, or plan breaks

CI: Who to interview?

- For a product designed to support work in more than one organisation (order processing, appointments booking…)
  - 2 -3 people in each role in each of 4- 6 organisations
  - choose diverse organisations
    - scale, physical organisation, technical sophistication…
- Stop when nothing new emerges
- Be prepared to be flexible, depending on findings
- Determine focus for each interview

CI: Next steps

- List of issues to cover
- Profiling & selecting suitable locations
- Training interviewers
- Pilot site visit
- Visits
  - Field notes, audiotape, photographs
  - Data shared with relevant staff back at the office
  - Feed into ‘work models’

Analyzing contextual inquiry info

1. Transcribe the interview
2. Fix the focus of analysis
3. Record understandings: coded transcripts or post-It notes
   - description of users' work
   - flow or structure of the work
   - description of problems in their work
   - description of problems with the computer tools
   - design ideas that emerge from understanding of their work
   - questions for subsequent interviews

Example of CI

Cheap Shop Catalog Store

- People shop by browsing paper catalogs scattered around the store.
- When a customer sees an item she want, she enter its item code from the catalog onto a paper form.
- Customers give this form to a clerk, who brings the item(s) from the back room to the front counter.
- Customers then pay for the items they want

Item code	Amount
323066 697	1

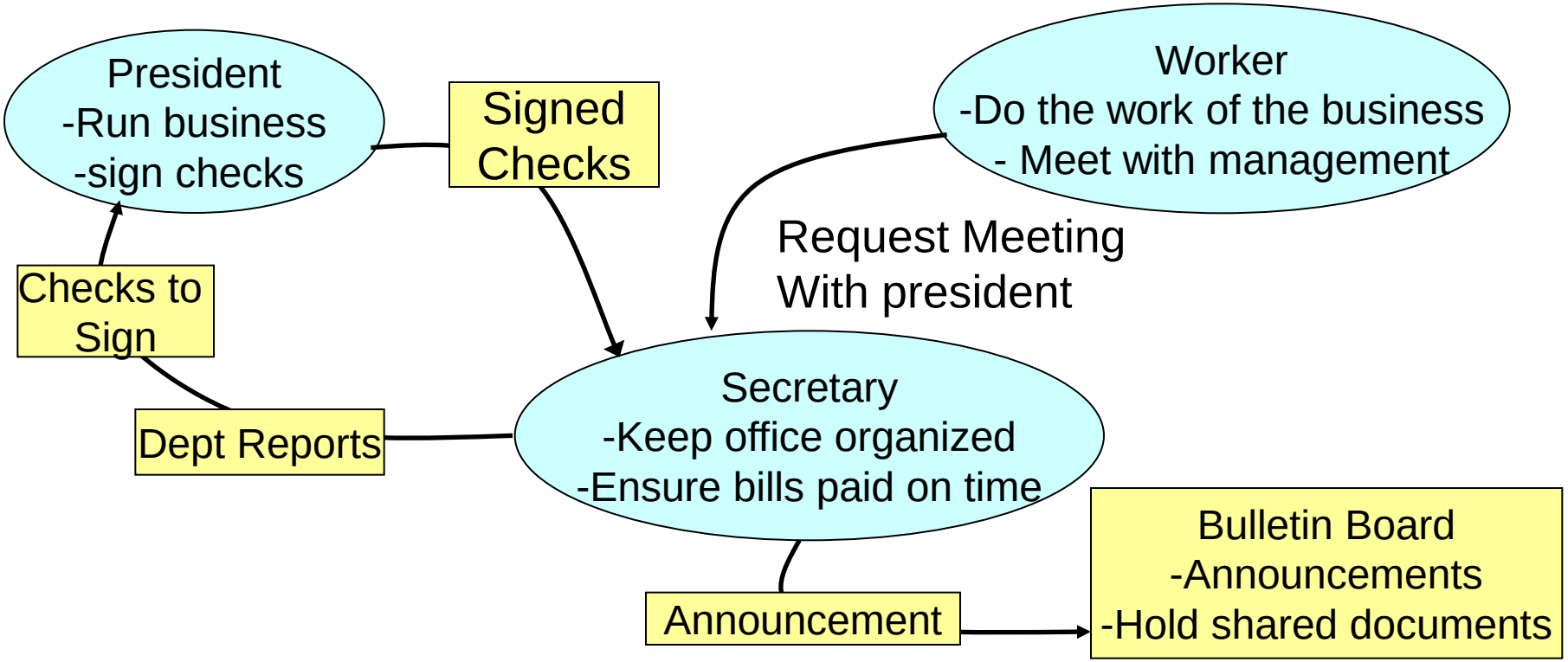
Work Modelling

In interpretation session, models are drawn from the observations:

- **Work flow model:** the people, communication and co-ordination
- **Sequence model**: detailed work steps to achieve a goal
- **Artifact model:** the physical ‘things’ created to do the work or used in the work
- **Cultural model:** constraints on the system from organizational culture
- **Physical model:** physical structure of the work, e.g. office layout

Work Flow Model

- How work is broken up across people & how it is coordinated to get the whole job done



Components of a flow model

- Individuals
- Responsibilities
- Groups
- The flow *itself*
- Artefacts
- The communication topic or action
- Places
- Breakdowns

Constructing a flow model (1)

- The *flow*, that is, the communication between people
- Shown as arcs on the diagram - note the direction of the arrow heads
- Remember that these might be
  - formal
  - informal

Constructing a flow model (2)

- The *communication topic* or *action* representing the detail of the flow.
- These are actions as opposed to artefacts
- Examples, requests or questions

Constructing a flow model (3)

- Communication is often (usually) mediated by artefacts
  - mediating artefacts might include documents
  - files and folders
  - Artefacts have a history and are owned
- Artefacts are conveyed in a medium, e.g.
  - email, paper, shouting
- Artefacts are shown as boxes on the arcs

Constructing a flow model (4)

- Finally, identify breakdowns
- Breakdowns or problems in communication or coordination are represented by a lightning flash

Homework

Make a flow diagram for the following:

A purchasing department is responsible for paying invoices as they come in. But they do not know if the goods were actually received; they have to work out who received the goods; send the invoice to him for approval, and then pay it only when he returns it signed. Making the purchase and paying for the goods have been separated from the actual work of the organisation. Formal sign-off and review processes keep the system working.

Sequence Model

Intent: Plug In

Intent: Handle Emergencies

Trigger: Return to office

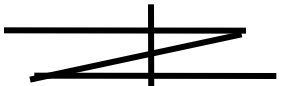
Scan message list for important message
(Uses sender, subject)

Choose urgent message

Read message about unhappy user

Decide more info needed

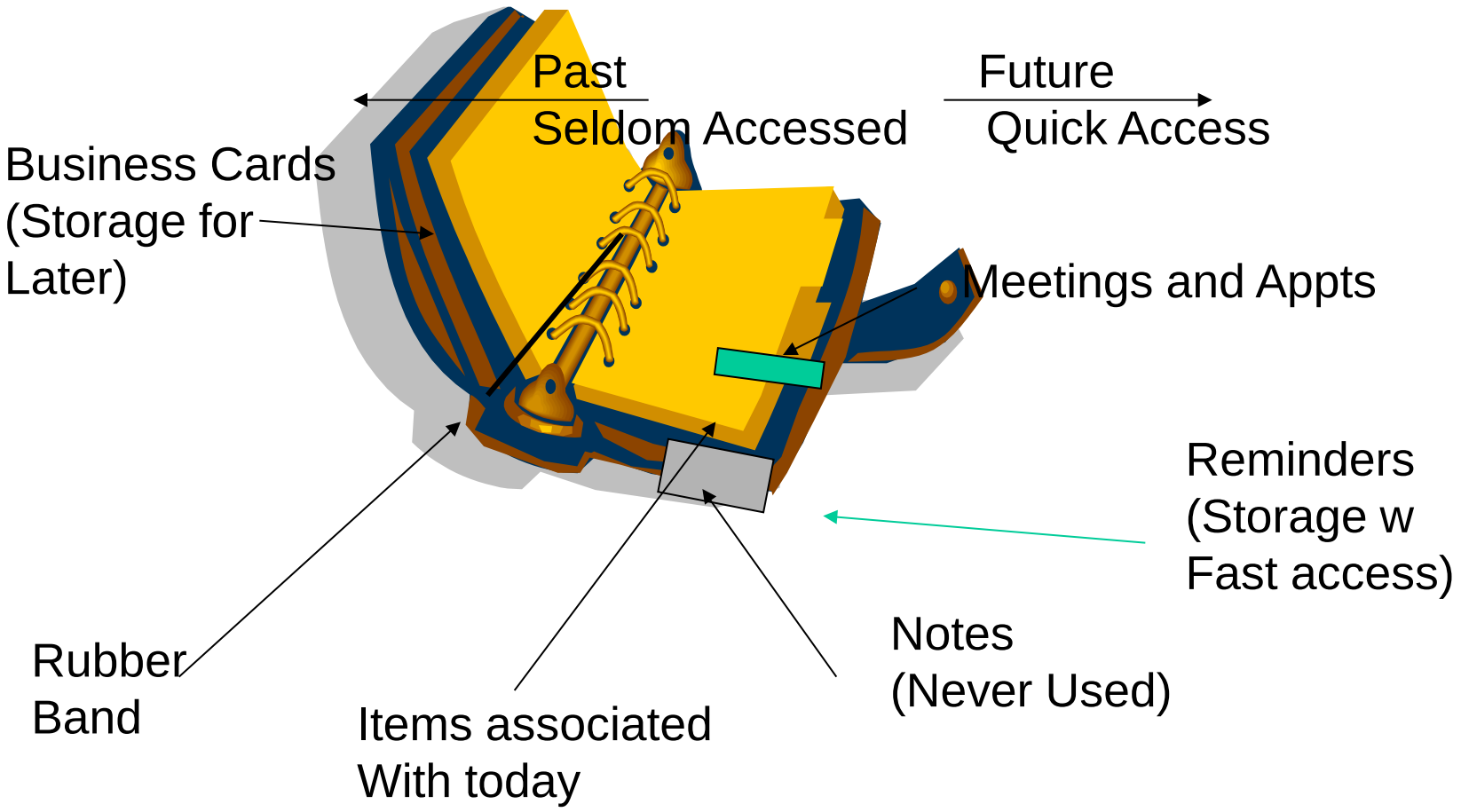
Make phone call



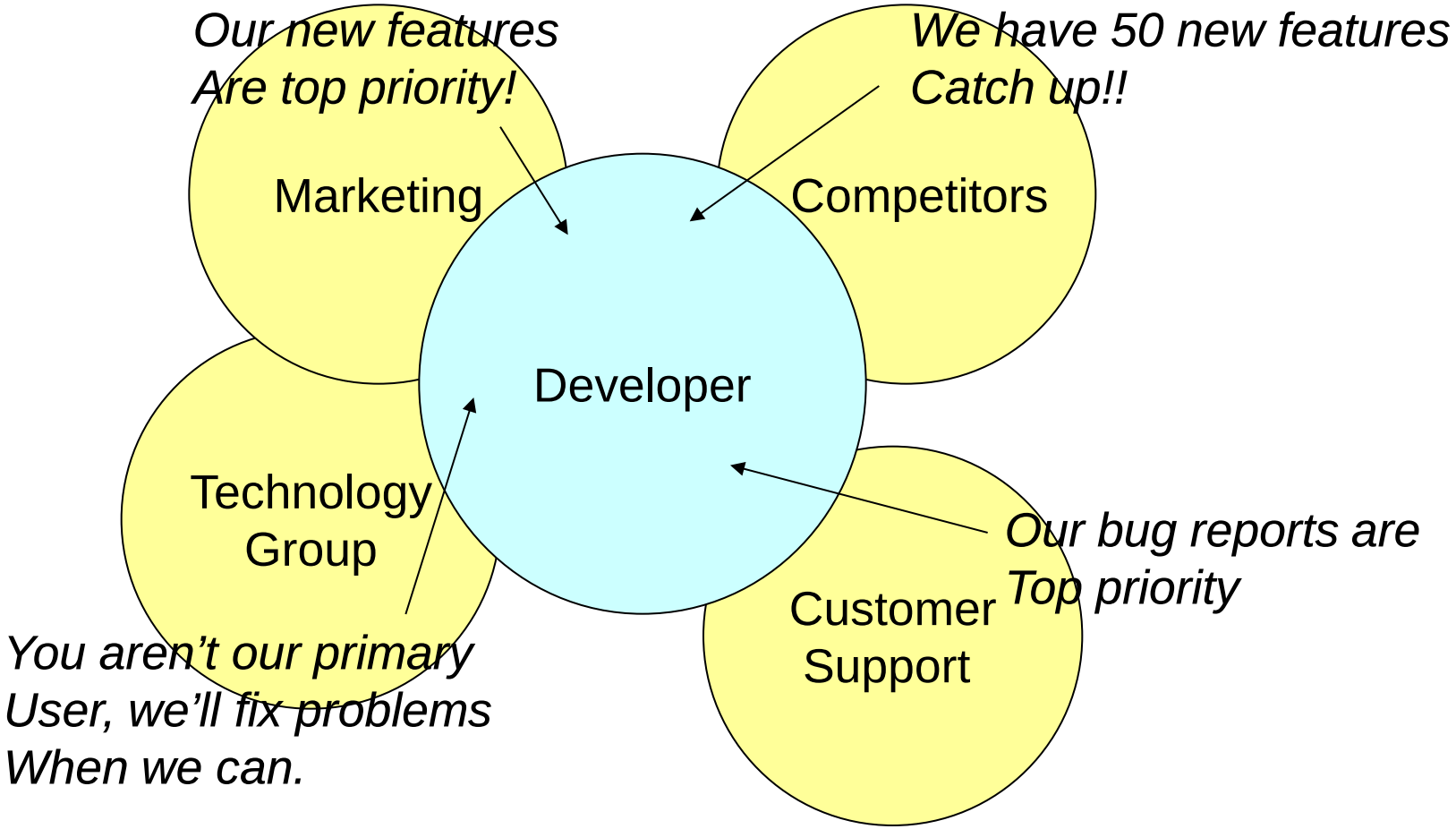
Leave phone message

Had to put off Issue of unhappy user

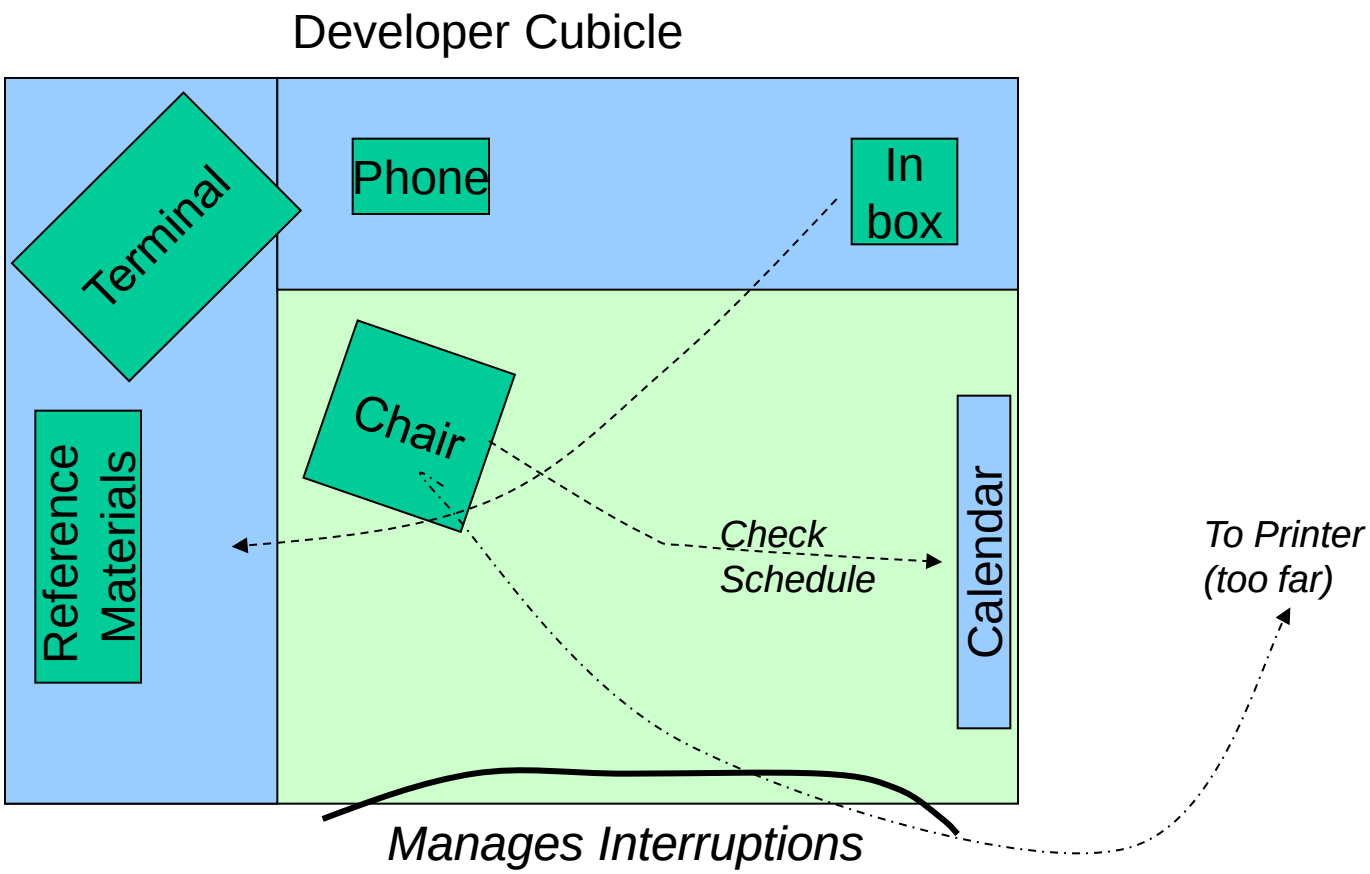
Artifact Model



Cultural Model



Physical Model



Consolidation

- Each contextual inquiry (one for each user/developer pair) results in a set of models
- These need to be consolidated into one view of ‘the work’
- Affinity diagram
  - —Organizes interpretation session notes into common structures and themes
  - —Categories arise from the data
  - —Diagram is built through induction
- Work models consolidated into one of each type

Affinity Diagram

Can “consolidate” insights from

- any one of the work models
- all of them together
- or on data collected in other ways, for example:
  - Brainstorming about design problems
    → **categories of problems**
  - Brainstorming about design ideas
    → **categories of ideas**
  - Comments from users
    → **categories of desirable / successful features**

Affinity Diagram

- Goal is to organize the information collected from Contextual Inquiry field studies
- Entire design team uses Post-its and large spaces to spatially organize ideas

How to make an affinity diagram?

1. Team writes down all insights on post-it notes
2. Stick one post-it on the wall
3. Arrange the other post-its around it, **grouping** by affinity to each other. **Iteration** will be required.
4. Look at each group and see what it has in common; **name and describe** each group**.**
5. "**Snapshot**" the result for documentation
   - digital photo → your design website or notebook
   - transfer post-its onto paper, 1 sheet / group → scan → website

Affinity Diagrams

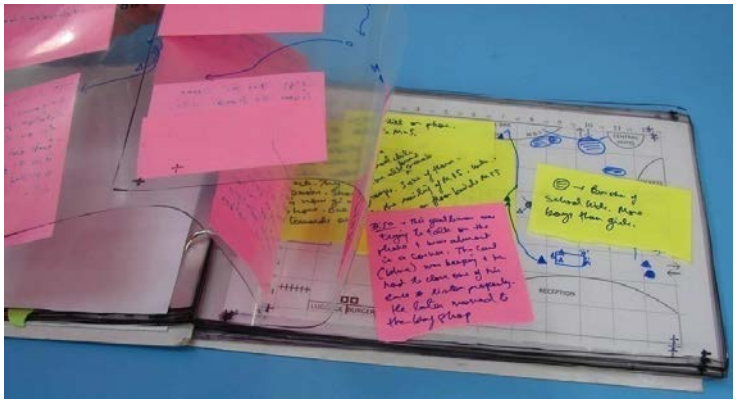
Design Ethnography more widely

- Design ethnographers can study what people do, not just at work, and not necessarily in partnership with them
- For example, on a focussed task: how are they using a cash machine, the automatic checkout in a supermarket, the check-in machines in an airport, etc.
- Or even wider, for instance, how are they interacting in a space, to gain ideas for future products or services

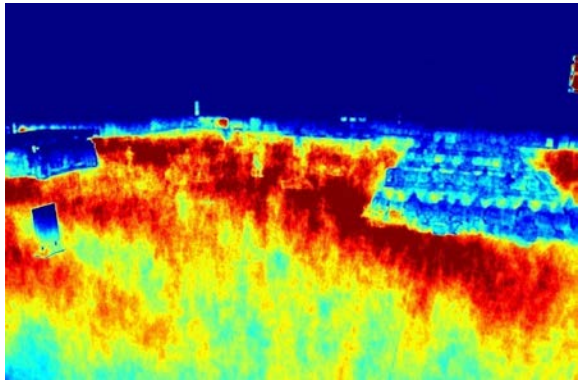
An Example of Design Ethnography (1)

Tools developed by Paul Gault to investigate a public space

Timelaps shots



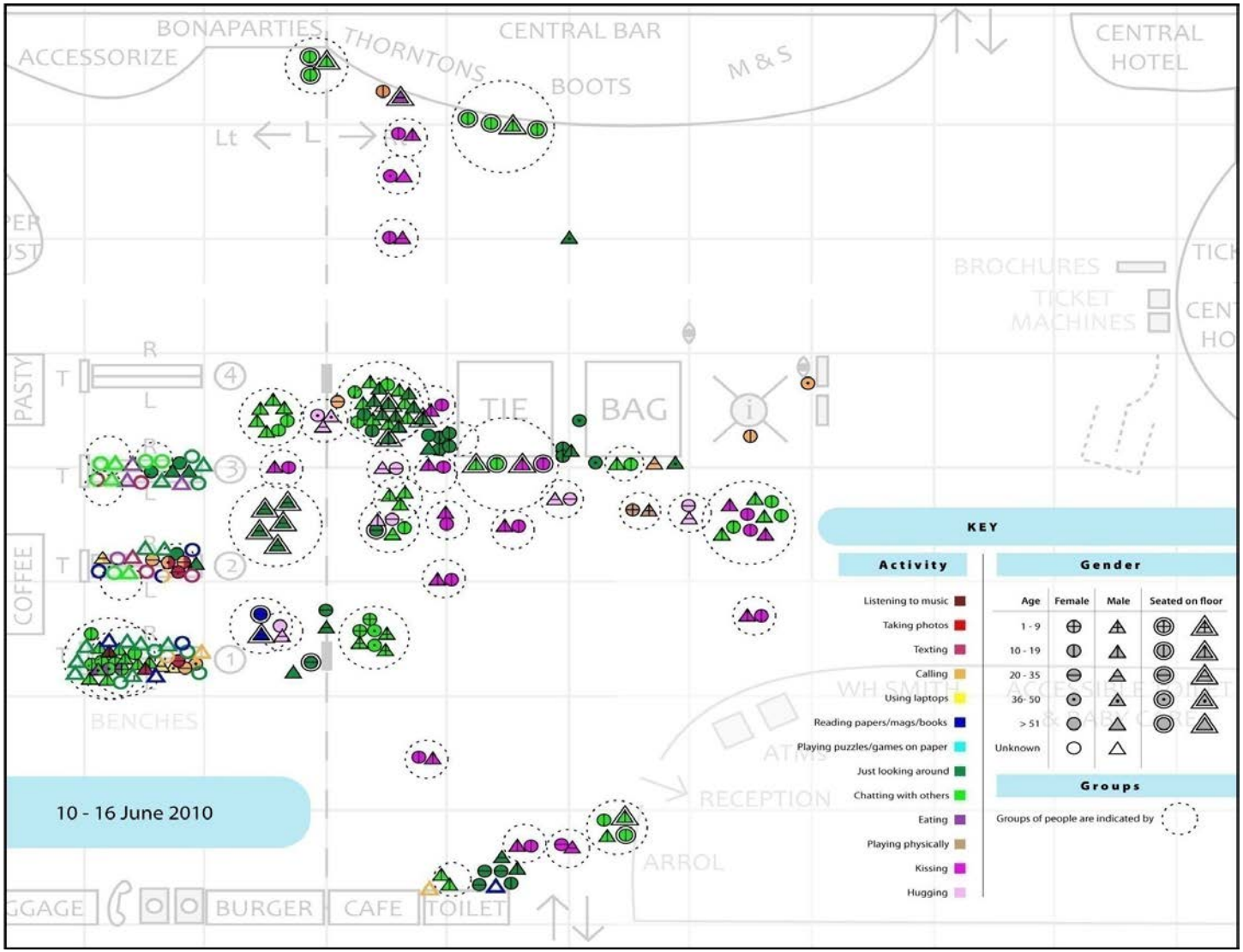
Transparency flipbook



Heat maps

An Example of Design Ethnography (2)

Collated activity, age and gender map over longer period



Learning outcomes

By the end of this lecture you should be able to:

Given a scenario (e.g. shop):

- How would you do a CI in this scenario?
- Explain what the results (models) of a CI in this scenario could be, and give examples for each.
- How could results from CI in this scenario be used in design?
- Make a model based on some story data
- Explain how ethnographic design could be used more widely