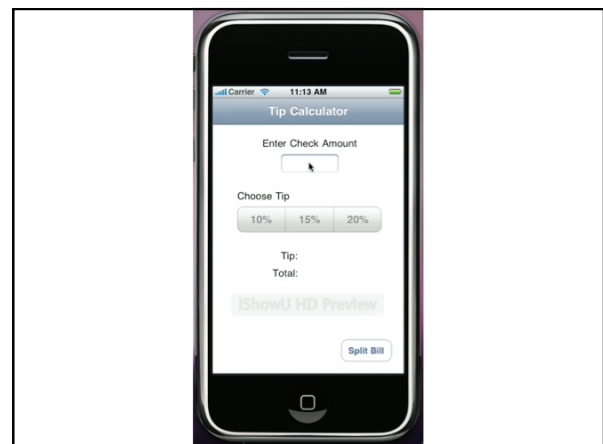
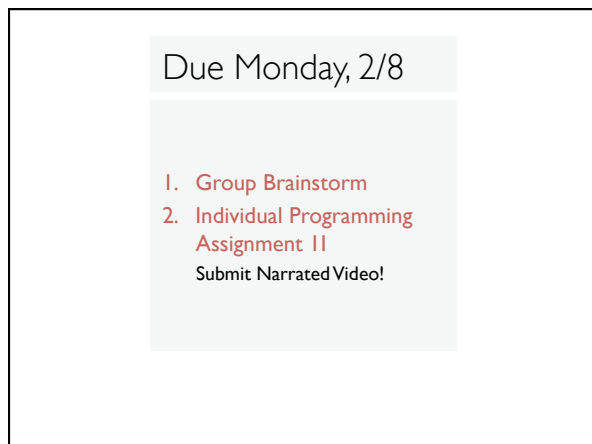
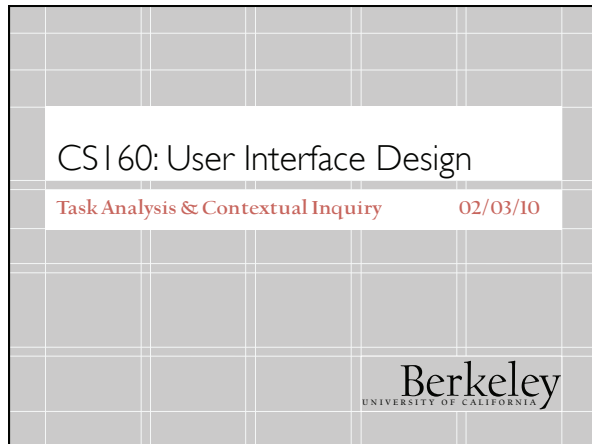
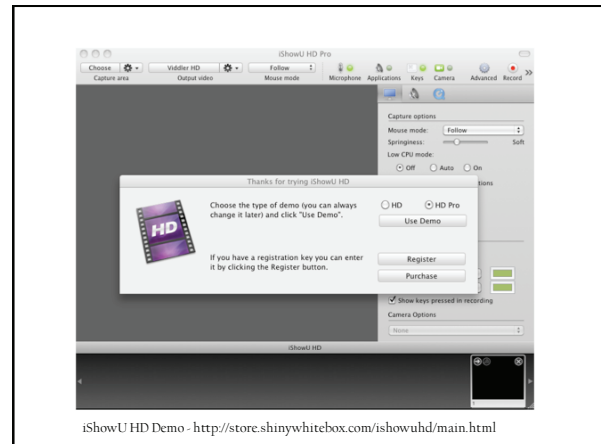
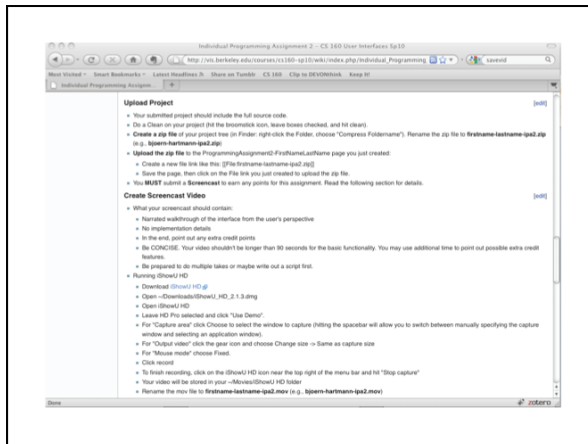






You can observe a lot by
just watching.
- Yogi Berra

Main Points of Today's Lecture

Don't just trust your intuition
to make design decisions.

Observe target users in
context to inform your design.



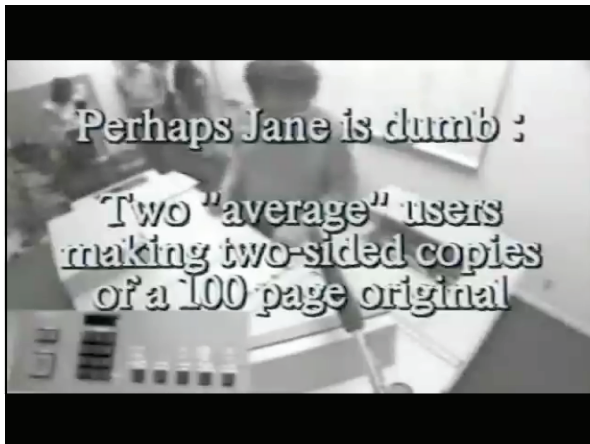
Xerox, ca. 1983...

Existing copiers judged as "too complicated" by customers. But why?

Lucy Suchman (UC Berkeley grad – Anthropology) at Xerox PARC suggests videotaping interactions.



Pushing the Green Button
(advertisement for the 8200 copier, c. 1983)



About those "average" users...

Allen Newell
(ACM Turing Award Winner)

Ron Kaplan
(ACM Fellow, Chief Scientist at Powerset/Bing)

Observation showed that difficulties were not due to lack of sophistication of users, but due to problems "reading" (making sense of) an unfamiliar artifact.

Many varieties of observation techniques:

Ethnography / Ethnomethodology
 Task Analysis
 Contextual Inquiry
 Cultural Probes
 Diary Studies
 Prompted “pager” studies”

Many varieties of observation techniques:

Ethnography / Ethnomethodology
Task Analysis
Contextual Inquiry
 Cultural Probes
 Diary Studies
 Prompted “pager” studies”

Goal: Understand user’s activities in context to inform (re-)design of information technology.

Task Analysis



BART Ticket Machine

Goals:

Buy new ticket
 Add value to ticket
 Pay with:
 Debit, Credit, Cash





How To Improve Design?

Understand users' tasks

Designers must think about ...

Who are the users?

What tasks they would want to carry out?

Observe existing practices

Create scenarios of actual use

Task Analysis Questions

1. Who is going to use system?
2. What tasks do they now perform?
3. What tasks are desired?
4. How are the tasks learned?
5. Where are the tasks performed?
6. What's the relationship between user & data?
7. What other tools does the user have?
8. How do users communicate with each other?
9. How often are the tasks performed?
10. What are the time constraints on the tasks?
11. What happens when things go wrong?

Task Analysis Questions

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Who is going to use it?

Identity

Need several typical users for broad product

Background/Skills

Knowledge users already have and rely on to perform task

Values, Likes/Dislikes

Personal characteristics

Education

Literacy

Physical traits, abilities/disabilities

Age

Who (BART)?

Identity

Types of users

Background/Skills

Knowledge they use to perform task

Who (BART)?

Identity

Tourists and visitors from elsewhere

Regular BART riders

Business people, students, disabled, elderly, etc.

Background/Skills

Have an ATM card or credit card?

Experience with other public transit?

Who (BART)?

Values, Likes/Dislikes

(i.e. May not like driving)

Who (BART)?

Values, Likes/Dislikes

May not like driving
 Want minimum fuss
 Sometimes in a hurry
 Maybe frugal (like saving money)
 Maybe environmentalists
 Hate having money eaten
 Want to feel safe and maintain privacy
 Hate feeling stupid

Who (BART)?

Personal characteristics

Education, Physical abilities, Age, etc

Who (BART)?

Personal characteristics

Mostly educated, fluent in English (Spanish important, too)
 Varying heights → don't make it too high or too low!
 Mixture of ages, a few disabled users (e.g. wheelchairs).
 Some bike users (make interface one-handed?)

We just did it wrong.

Don't guess – Observe!

Go out and find who uses the artifact you are replacing or redesigning!

Talk to Them

Find some real users

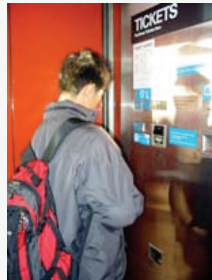
Talk to them

Find out what they do now
How would your system fit in?
More on this a bit later

Are they too busy?

Buy their time

t-shirts, coffee mugs, etc.



Video by Ljuba Miljkovic & Ben Cohen

Task Analysis Questions

1. Who is going to use system?
2. **What tasks do they now perform?**
3. **What tasks are desired?**
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Old and New Tasks

Old

The way people do things now

New

The way you anticipate them doing things in future

Observe!

Pick the most important tasks

What Tasks (BART)?

Old

Use cash, credit or debit to buy new ticket with \$x stored on it
Add fare to existing ticket

New

Use cash, credit or debit to buy new ticket
Add fare to existing ticket
Get pricing information for destination
Buy "destination" tickets

Task level of detail can vary based on goals of analysis

Example: On-Line Medical Records

Dental office installed new automated billing system

Assistants unhappy with new system

Old forms had hand-written notes

e.g., patient A's insurance takes longer than most, etc.

Task Analysis Questions

1. Who is going to use system?
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How are Tasks Learned?

What does the user need to know?

Do they need training?

Book/manual information
General knowledge / skills
Special instruction / training

Experience, level of education and literacy

8th grade is often reasonable in broad design contexts

Learning Tasks (BART)

What does the user need to know?

Walk up & use system

Can't assume much background/training

Do they need training?

Too time consuming

Experience, level of education and literacy

Must be simple & similar to existing systems

Vending machines

ATM machines

Where is the Task Performed?

Office, laboratory, point of sale, home?

Effects of environment on users?

Lighting, sound, comfort, interruptions, water

Social influence of environment

Rituals, sacred places

Effects of other people (bystanders)?

Rushing, safety, privacy

Where (BART)? Train Station



Where (BART)? Train Station

Loud

Voice I/O not a good idea

Privacy

Others can look over shoulder

PIN must be confidential

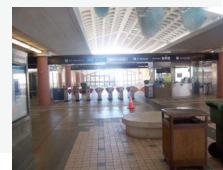
Don't confirm with sound

Lighting is dim

Make sure messages are readable

Rituals

Panhandlers, musicians,
reading the paper, cell phones



Task Analysis Questions

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Data Relationships

Personal data

Privacy

- Always accessed at same machine?
- Do users move between machines?

Common data

Handling and processing

- Used concurrently?
- Passed sequentially between users?

Remote access required?

Access to data restricted?

Data Relationships (BART)

Personal data

- Users may use any machine
- Store info on BART card

Common data

- Fare rules (e.g., how much for BART Plus)
- Used concurrently

Access to data restricted?

- Only you can use your ATM or credit card

No need for remote access

Other Tools

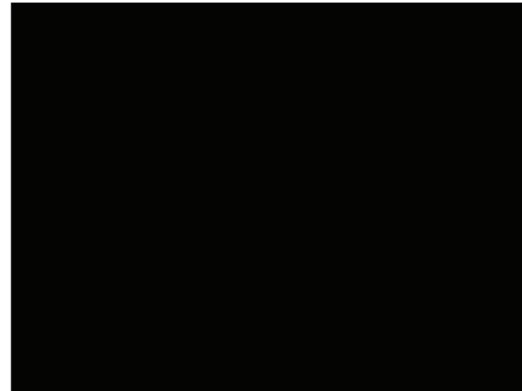
Users work with collection of tools

- Cell phone
- Home PC
- Printed schedules
- Maps

Can we use other tools to facilitate interaction?

Other Tools (BART)

Credit, debit cards (today)
 E-wallet in cell phone or organizer (someday)
 Real-time train info on the web
 User has PC at home
 Could provide auditing for them?
 Text on phone, use for BART delay alerts?



IDEO/Docomo from Moggridge, Designing Interactions

Task Analysis Questions

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How do users communicate?

Who communicates with whom?
 About what?

Follow lines of the organization? Against it?

Example: assistant to manager

Installation of computers changes communication between them

People would rather change their computer usage than their relationship

Not so relevant in context of BART

How often are the tasks performed?

Frequent users remember more details

Infrequent users may need more help

But don't make it tedious

Which function is performed

Most frequently? By which customers?

Optimize system for these tasks will improve perception of good performance

Frequency (BART)?

Varying frequency of customers

Some (most) take BART every day

Some take it only occasionally (depends on station!)

Varying frequency of tasks

Might do add fare or buy new ticket every day

Novices: Just one set of detailed instructions

Experienced Users: Provide overview of process

How to find out for sure?

Observe and interview customers!

Task Analysis Questions

1. Who is going to use system?

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Time Constraints

What functions will customers be in a hurry for?

Which can wait?

Is there a timing relationship between tasks?

Time Constraints (BART)?

Customers will almost always be in a hurry

Lines form

Take less than 1 minute/transaction

Be able to do any task in any order

When Things Go Wrong

How do people deal with

Errors?

Practical difficulties?

Catastrophes?

Is there a backup strategy?

When Things Go Wrong (BART)

Confusion/errors on task

"Start over" button

Practical difficulty

Generated ticket with too much money. Now What?

Catastrophe

Machine eats card - swipe instead of insert?

Backup strategy

Use cash in regular machines (and provide ATM)

When Things Go Wrong (BART)



Identifying Tasks for Your Design

Real tasks users have faced

Collect any necessary materials

Should provide reasonable coverage

Compare check list of functions to tasks

Mixture of simple & complex tasks

Easy task (common or introductory)

Moderate task

Difficult task (infrequent or for power users)

What Should Tasks Look Like?

Say what user wants to do, not how user would do it

Allows comparing different design alternatives

Often very specific

Forces us to fill out description with relevant details

Say who the users are (use personas or profiles)

Design can really differ depending on the target user

Name names (allows getting more info as necessary)

Characteristics of the users (job, expertise, etc.)

Some describe a complete job

Forces us to consider how features work together

Using Tasks in Design

1. Write up a description of the tasks
2. Produce scenarios covering each task
3. Rough out an interface design

Using Tasks in Design

Write up a description of tasks

Formally or informally

Run by users and rest of the design team

Get more information where needed

Using Tasks in Design

Produce scenarios covering each task

Task-based scenarios

Elaborated scenarios

Full-scale scenarios

Using Tasks in Design

Produce scenarios covering each task

Task-based scenario example:

Jill is traveling to Seattle for her job next week and she wants to check on the amount she can be reimbursed for meals and other expenses.

Using Tasks in Design

Produce scenarios covering each task

Elaborated scenario example:

It's Friday afternoon and Joe is flying to Sydney. He doesn't have enough money for a taxi to the airport, and he's running late.

He goes to the local ATM and identifies himself.

He specifies that he wants \$100 from his savings account. He'd like the money in \$20 notes so that he can give the taxi driver the correct change.

He doesn't want a printed receipt, as he doesn't bother keeping track of transactions in this account.

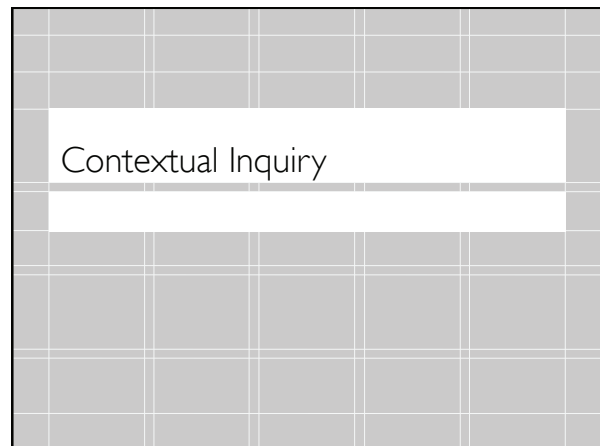
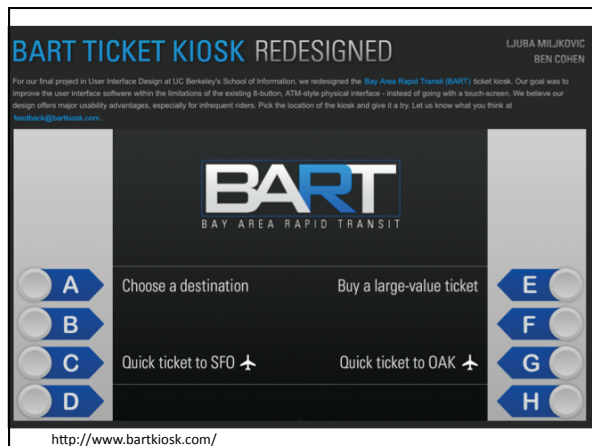
Using Tasks in Design

Rough out an interface design

Discard features that don't support your tasks

(or add a real task that exercises that feature)

Sketch major screens & functions (not too detailed)



Goals

Method:

"Go where the customer works, observe the customer as she works, and talk to the customer about their work" [Holtzblatt]

Goals:

Get inside the user's head

See their tasks the way they do

A middle ground between pure observation and pure interview

Guideline: Master-Apprentice Model

Allows user to teach us what they do

- Skill knowledge is usually tacit (can't put it in books)
- Sometimes literal apprenticeship is best



Matsushita Home Bakery – First automatic bread maker to have twist/stretch motion [Nonaka 95]

Principles of Contextual Inquiry

1. Context
2. Partnership
3. Interpretation
4. Focus

Principles: Context

Go where the work is:
 Conduct inquiry in a normal work environment
 People summarize, but we want details
 Keep it concrete when people start to abstract
 “We usually get reports by email”, ask “Can I see one?”
 Look for skipped steps, ask user to fill them in.

Principles: Partnership

Master / Apprentice + intermittent probing

Alternative models (what's wrong with them?)

Interviewer / Interviewee

Expert / Novice

Guest / Host

Why not just interview folks?





Problems with Master-Apprentice?

A potential problem with the master/apprentice model that is not addressed in the reading is the sole focus on daily activities during the design process. [...] It is not guaranteed that every topic will come up in the master/apprentice model, depending on what events occur during the time the two spend together and the level of skill of the master.

(David Nguyen)

Problems with Master-Apprentice?

I think that one disadvantage of the master/apprentice model is that it is not natural. The idea is to exhibit one's actions and behaviors during their work, trying to capture what they do in their natural environment. I know that if someone followed me around all day I would have a hard time staying focused on my usual work routine.

(Matt Vaznaian)

Example: Paper Flight Strips



W. Mackay: Is Paper Safer? The Role of Paper Flight Strips in Air Traffic Control

Example: Paper Flight Strips

AF R 5 5 5 7-150243
EAS2 450 LPH
0540 MERLE
280 1114 TP

Paris (Athis Mors), France: en route control center
S U R 5 5 5 430200 290
EAS2 450 LPH
5602 1758 ZA

Bordeaux, France: en route control center
CDBR 8730 KLX321 230LX
1747-CT CHW 831 390 LPH CCLP2

Maastricht, the Netherlands: en route control center
7347 VLA 245
DEL 810

Amsterdam, the Netherlands: en route control center

Principles: Partnership

Stick with master-apprentice; avoid other models, i.e.

Avoid interviewer/interviewee

Above all, don't "teach"!

Partnership allows more apprentice interaction

OK to be a designer and interrupt!

... but go back "in role" afterwards.

Alternate watching & probing (withdrawal & return)

Principles: Interpretation

Good facts only the starting point

Design based on interpretations

Validate & rephrase

Check interpretations with user

Be committed to hearing what user is really saying

Principles: Focus

You need data about specific tasks

Steer conversation to stay on useful topics

Respect "intrapersonal triggers"
(flags to change focus/understanding)

"Why would they do that?"

Admit your ignorance

Thoughts on Inquiries

Establish rapport before diving in

Use recording technologies

Notebooks, tape recorders, still & video cameras

Master/apprentice can be hard

Staying in role – it's a lot like acting

Don't correct! Its not a lesson!

Its hard not designing on the fly

Personas

Personas (from Cooper)

"Hypothetical Archetypes"

Archetype: (American Heritage)

An original model or type after which other similar things are patterned; a prototype

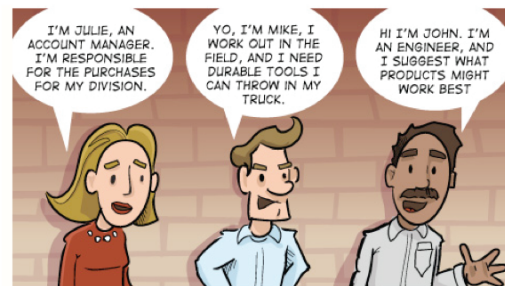
An ideal example of a type; quintessence

A precise description of user in terms

Capabilities, inclinations, background

Goals (not tasks)

Persona Examples



Brad Colbow (<http://aronoff.com/blog/design/how-to-understand-your-users-with-personas/>)

Why Personas?

It's hard to reason about users in aggregate, and impossible to please everyone.

General users have too many conflicting goals.

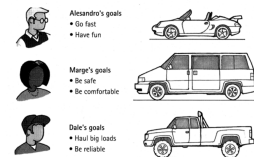


<http://simpsons.wikia.com/wiki/File:TheHomer.png>

Why Personas?

It's easier to reason about specific fictional people.

Specific personas have clear, well-articulated goals



Defining and Using Personas

Defining them

Identify major clusters from multiple user interviews/inquiries

Synthesize their goals

Check for completeness and specificity

Specificity prevents "elastic user"

Try them out by developing narrative

Design each interface for a single primary persona

Yet other type might use the interface

	AMANDA	GLORIA	CHARLES
Age	7	34	66
Occupation	Second grade student	Part-time office administrator	Retired accountant
Home Life	Lives with her mother, father, and younger sister in the suburbs of a large city.	Lives with her husband and two children in a mid-sized city.	Lives with his wife in the suburbs; has four children and six grandchildren.
Education	In elementary school	Has a bachelor degree	Has an MBA
LIFESTYLE			
Activities	Plays soccer, reads, and takes ballet lessons; saves her birthday money and allowance to spend at the mall.	Enjoys crossword puzzles and reading mystery novels. Spends a lot of time driving her children to activities.	Likes to work in the garden and drink wine. Enjoys traveling with his wife and investing in the stock market.
Ultimate Goal	Goal is to turn 10 so that	Goal is to make sure her	Goal is to make sure

Personas vs. Observations

How do personas differ from the people you observed in your inquiry?

Summary

Task analysis

- Understand users and their tasks
- Real tasks with reasonable functionality coverage
- Do your best to anticipate new tasks

Contextual inquiry

- Helps answer the task analysis questions
- Hybrid between interview and observation
- Use master-apprentice model to get them to teach you

Personas

- Specific archetype of target user
- Build based on contextual inquiries/interviews

Next Time

Conceptual Models

[Cognetics and the Locus of Attention.](#)

The Humane Interface. Chap 2. Raskin.

Don't forget to read, then write comment on wiki!

You should be well on your way with
Programming Assignment III!