

CSE 440: Introduction to HCI

User Interface Design, Prototyping, and Evaluation

Lecture 05:
Task Analysis

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Tuesday/Thursday
10:30 to 11:50
MOR 234

Where we came from

System will fail if:

It is inappropriate for the customer

It does not meet customer needs

Your contextual inquiries have emphasized getting to know your customers and their needs

... So we know what to
build now, right?

Can't we now just make '*good*' interfaces?

Why Task Analysis?

‘Good’ has to be interpreted in the context of use

- Might be acceptable for office work, but not for play

- Infinite variety of tasks and customers

Guidelines are too vague to be generative

- e.g., “give adequate feedback”

Design is often about tradeoffs

- Examples?

Why Task Analysis?

Task analysis complements the information you obtain through methods like contextual inquiry

Use what you learned in your inquiry to answer the questions in the task analysis

Your assignments order the two, but in practice you should iteratively decide how to best draw upon all relevant methods throughout a process

Why Now?

Task analysis questions due Tuesday, October 14

11 Task Analysis Questions

- Who is going to use the system?
- What tasks do they now perform?
- What tasks are desired?
- How are the tasks learned?
- Where are the tasks performed?
- What is the relationship between customers & data?
- What other tools does the customer have?
- How do customers communicate with each other?
- How often are the tasks performed?
- What are the time constraints on the tasks?
- What happens when things go wrong?

Question 1

Who is going to use the system?

Identity

In-house or specific customer is easy

Broad products need several typical consumers

Background

Skills

Work habits and preferences

Physical characteristics



Seattle Parking Meter

Who is going to use the system?

Identity?

People who park in Seattle

business people, students, elderly, tourists

Background?

Have used parking meters before

May have an ATM or credit card

Have used other fare machines before

Skills?

may know how to put cards into ATM

Seattle Parking Meter

Who is going to use the system?

Work habits and preferences?

Park several times a week, a month, a year?

Physical characteristics?

Varying heights, don't make it too high or too low

Anything else?

PARK, PAY & DISPLAY

Parking Pay Station Instructions



Insert card and push **BLUE** button to buy time **OR**
Insert coins to buy time



Push **GREEN** button to print receipt



Remove card quickly
wait for receipt and
display properly



Display one receipt only to
park in any meter or pay station
space until your time expires



PARALLEL
curbside

driver's
side

ANGLE



For **MOTORCYCLES**,
tape to headlight cover

Questions? Call 684-ROAD (7623)
paystations@seattle.gov



Seattle Department of Transportation

泊車、付款並顯示

泊車付費站使用說明



插入卡並按**藍色**
按鈕購買時間，
或投入硬幣購買時間



按**綠色**按鈕
打印收據



迅速將卡取出
等候收據並適當顯示
僅限顯示一張收據，
以便在任何咪表或付費
站的車位泊車，直到您
的時間到期

請使用可剝離的背面，
將收據貼在
前座側車窗內側



如果是摩托車，
請貼在車頭燈罩上

有問題嗎？請致電 684-ROAD (7623)
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ĐẬU XE, TRÀ TIỀN & DÁN BIÊN NHẬN

Hướng Dẫn về Trạm Trà Tiền Đậu Xe



Đút thẻ vào và bấm nút **XANH**
để mua giờ **HOẶC**
Bỏ tiền cắc để mua giờ



Bấm nút **XANH**
để in biên nhận



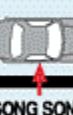
Rút nhanh thẻ ra
chờ biên nhận và
dán đúng cách



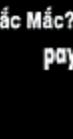
Chỉ dán một biên nhận
để đậu xe tại bất cứ chỗ nào
có đồng hồ hoặc trạm trả tiền
cho đến khi hết giờ đậu



Dùng miếng dán mặt sau có thể gỡ ra
để dán biên nhận vào MẶT TRONG
của kính băng trước



Đối với XE GẦM MÁY,
dán vào chụp đèn trước

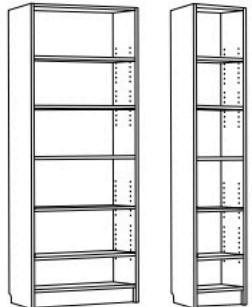


Thắc Mắc? Hãy gọi số 684-ROAD (7623)
paystations@seattle.gov

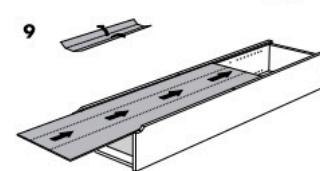
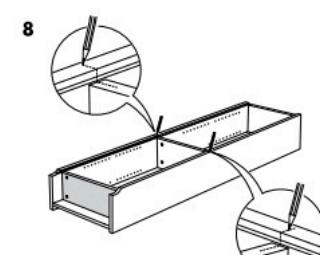
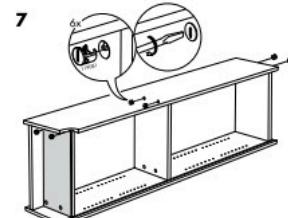
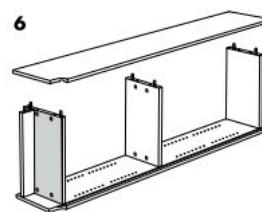
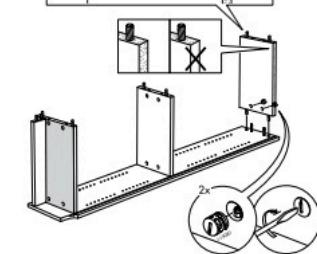
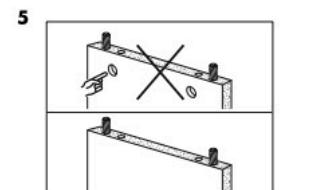
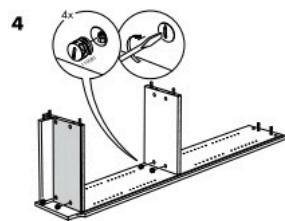
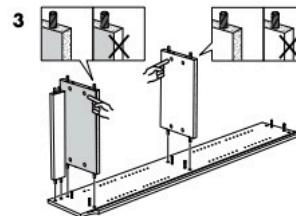
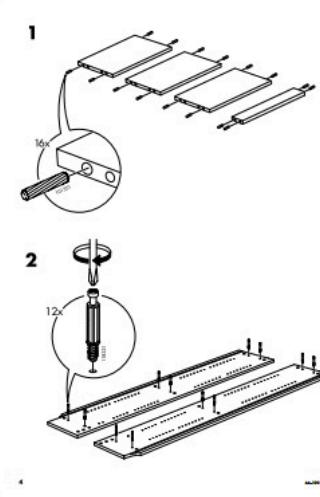


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BILLY

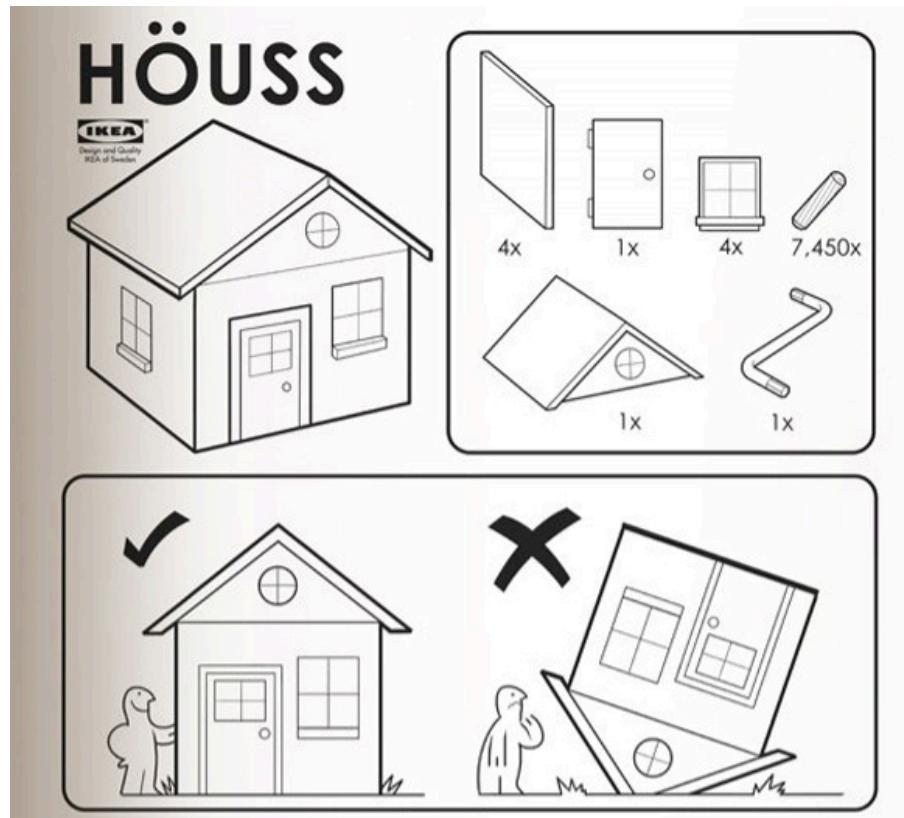
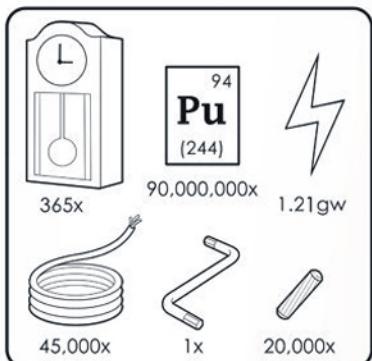
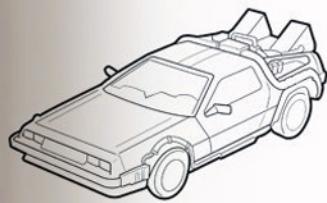


IKKE
Durable and Quality
Made in Sweden



DJILORIANN

IKEA
Design and Quality
SE of Sweden



Question 2 and Question 3

What tasks do they now perform?

What tasks are desired?

Important for both automation and new functionality

Relative importance of tasks?

Observe customers, see it from their perspective

Automated Billing Example

small dentists office had billing automated

assistants were unhappy with new system

old forms contained hand-written margin notes

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

Yorkshire Pudding

Individual

poonful salt
beaten
1 milk

beaten egg and add
melted fat. Bake in
25 min. Makes 11

cup. flour, add 4
baking powder to
g and bake same as

sp. baking powder,
same as for Plain
and adding to other
14.

to 1 cup. chopped
fruit with 2 tbsp.
dates, figs, apples,

beat well
beat my 2 cupfuls flour 2 eggs
 $\frac{1}{2}$ teaspoonful salt 2 cupfuls milk *makes 1/2*
 2 teaspoonfuls melted fat

Beat eggs slightly. Sift flour and salt, and add alternately with milk to eggs. Add melted fat. Beat with egg beater until smooth and full of bubbles. Fill hot greased cast aluminum or iron gem-pans or glass or earthenware custard cups, $\frac{2}{3}$ full of popover batter. Place immediately in a hot oven of 450° F. and bake for 30 min. Then lower temperature to 350° F. and bake for 15 min. longer. Makes 9 popovers.

CORNBREAD

2 cupfuls cornmeal	2 cupfuls sour milk
1 teaspoonful soda	2 eggs, beaten
$1\frac{1}{2}$ teaspoonfuls salt	2 tablespoonfuls melted fat
3 tablespoonfuls sugar	

Sift dry ingredients together. Mix milk with beaten eggs and add to dry ingredients. Stir well together and add melted fat. Pour into a hot greased baking pan or muffin tins and bake in hot oven of 400° F. for 20-25 min. Makes 24 pieces.

GRIDDLE CAKES

Question 4

How are the tasks learned?

What does the customer need to know?

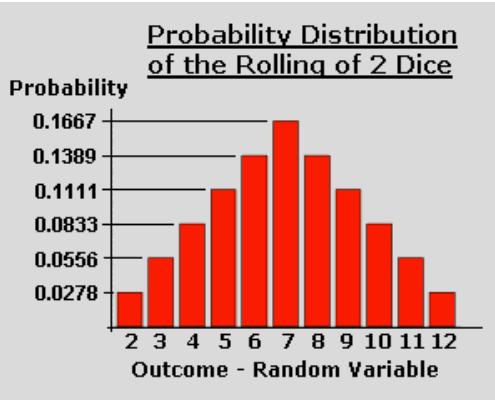
Do they need training?

academic

general knowledge / skills

special instruction / training





Question 5

Where are the Tasks Performed?

Office, laboratory, point of sale?

Effects of environment on customers?

Are people under stress?

Confidentiality required?

Do they have wet, dirty, or slippery hands?

Soft drinks?

Lighting?

Noise?



Question 6

What is the relationship between customers & data?

Personal data

Always accessed at same machine?

Do people move between machines?

Common data

Used concurrently?

Passed sequentially between customers?

Remote access required?

Access to data restricted?

Question 7

What other tools does the customer have?

More than just compatibility

How customer works with collection of tools

Automating lab data collection example:

how is data collected now?

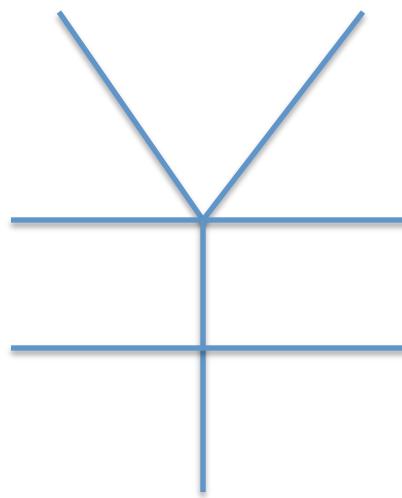
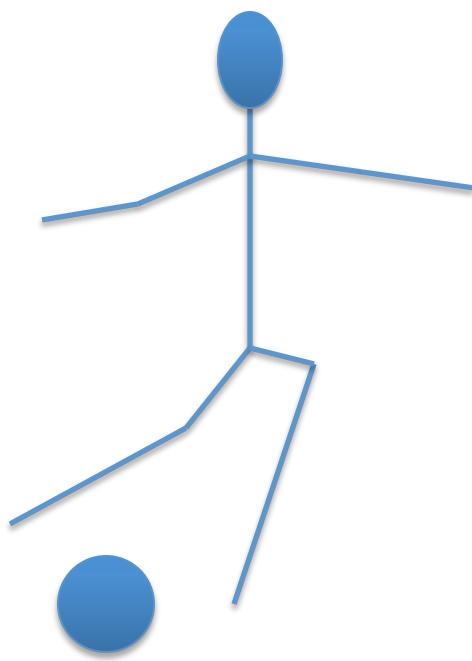
by what instruments and manual procedures?

how is the information analyzed?

are the results transcribed for records or publication?

what media/forms are used and how are they handled?







memegenerator.net



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5:31
fitbit
friends

	Sierra!	106,758	3
	Clarko	89,547	1
	Christine B.	74,791	2
	Chelsey D.	44,018	4
	You	28,664	5



...

Question 8

How do customers communicate with each other?

Who communicates with whom?

About what?

Follow lines of the organization? Against it?

Question 9

How often are the tasks performed?

Frequent customers likely remember more details

Infrequent customers may need more help

Even for simple operations

Make these tasks possible to accomplish

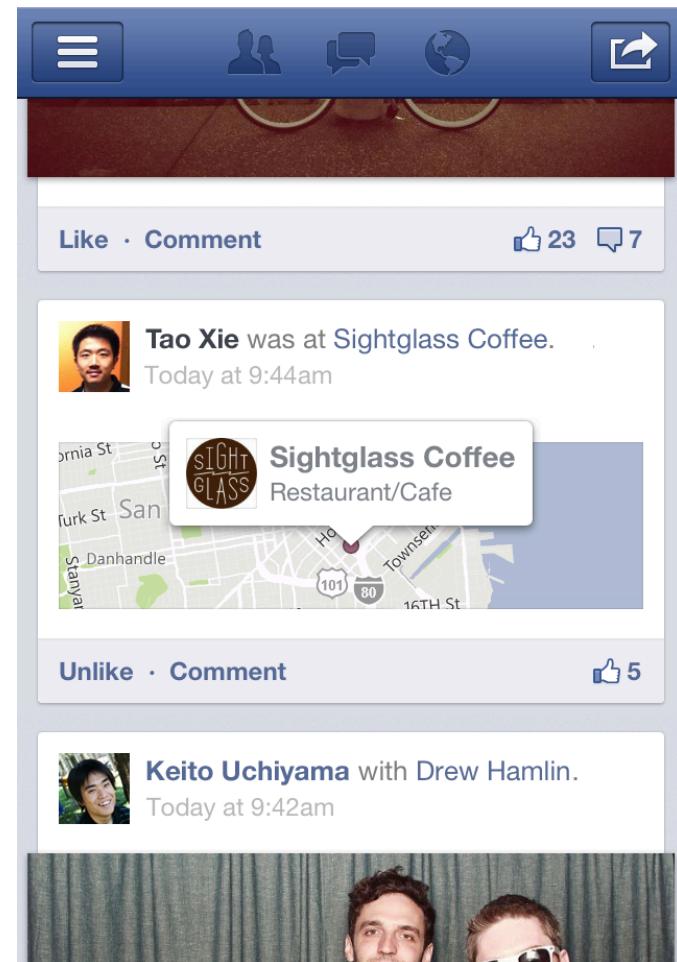
Which function is performed

Most frequently?

By which customers?

Optimizing for these will improve perception of performance

Careful about initial use though



Question 10

What are the time constraints on the tasks?

What functions will customers be in a hurry for?

Which can wait?

Is there a timing relationship between tasks?

Question 11

What happens when things go wrong?

How do people deal with

task-related errors?

practical difficulties?

catastrophes?

Is there a backup strategy?

What are the consequences?

Selecting Tasks

Real tasks customers have faced or requested

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 customers)

What Should Tasks Look Like?

Say what customer wants to do, but not how
allows comparing different design alternatives

Be very specific – stories based on facts!

say who customers are (use personas or profiles)

design can really differ depending on who

give names (allows referring back with more info later)

characteristics of customers (job, expertise, etc.)

story forces us to fill out description w/ relevant details

Sometimes should describe a complete “job”

forces us to consider how features work together

Using Tasks in Design

Write up a description of tasks

formally or informally

run by customers and rest of the design team

get more information where needed

Manny is in the city at a bar and would like to call his girlfriend, Sherry, to see when she will be arriving at the bar. She called from a friend's house while he was in the Paul Allen Center basement, so he missed her call. He would like to check his missed calls and find the number so that he can call her back.

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

- major screens & functions (not too detailed)

- hand sketched

Produce scenarios for each task

- what customer has to do & what they would see

- step-by-step performance of task

- illustrate using storyboards

Scenarios

Scenarios are design specific, tasks are not

Scenarios force us to

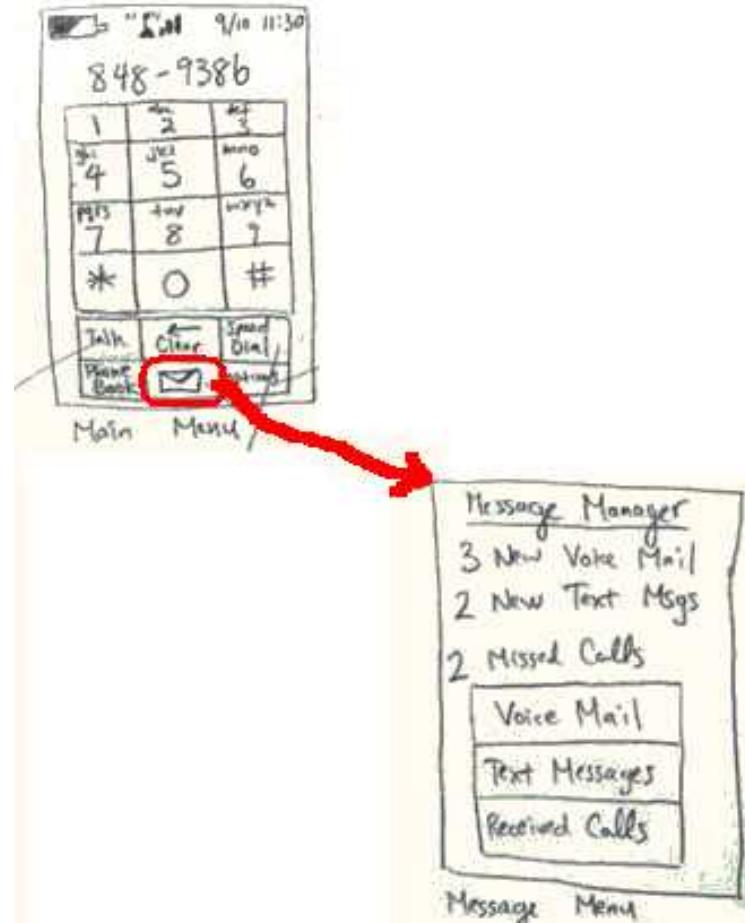
show how features will work together

settle design arguments by seeing examples

but these are only examples, and sometimes need to look beyond flaws

Show users storyboards

get feedback



Caveats of User-Centered Design

Politics

- “agents of change” can cause controversy
- get a sense of organization & bond w/ interviewee
- important to get buy-in from all those involved

Customers are not always right

- cannot anticipate new technology accurately
- job is to build system customers will want
 - not system customers say they want
 - be very careful about this (you are outsider)
 - if you can't get customers interested, you're probably missing something

Design/observe forever without prototyping

- rapid prototyping, evaluation, & iteration is key

Summary

Task Analysis questions

- Who is going to use the system?
- What tasks do they now perform?
- What tasks are desired?
- How are the tasks learned?
- Where are the tasks performed?
- What's the relationship between customer & data?
- What other tools does the customer have?
- How do users communicate with each other?
- How often are the tasks performed?
- What are the time constraints on the tasks?
- What happens when things go wrong?

Selecting tasks

- Real tasks with reasonable functionality coverage
- Complete, specific tasks of what customer wants to do

Personas



University of Washington

Question 1

Who is going to use the system?

Identity

In-house or specific customer is easy

Broad products need several typical consumers

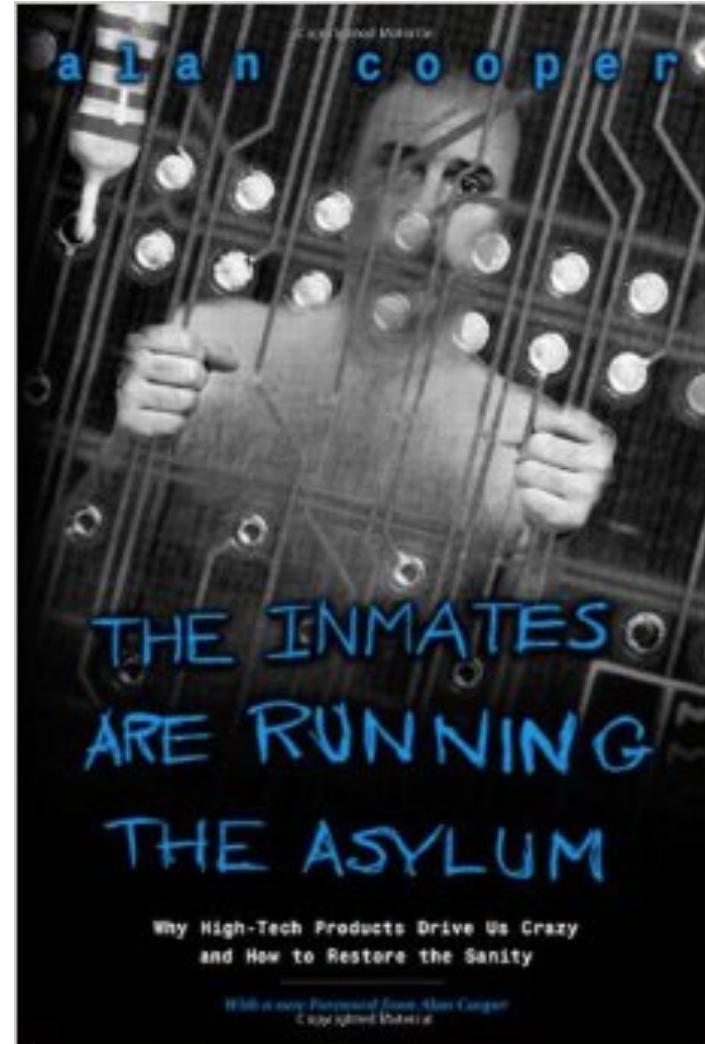
Background

Skills

Work habits and preferences

Physical characteristics

“If you want to create a product that satisfies a broad audience of users, logic will tell you to make it as broad in its functionality as possible to accommodate the most people. **Logic is Wrong.**”



3 types of people

- Parent concerned about safety
- Carpenter who needs to transport tools
- Executive looking for a fast & sporty car



Principles of Personas

- More specific, more effective
- Give the person detail
- Give them a name
- Make it believable

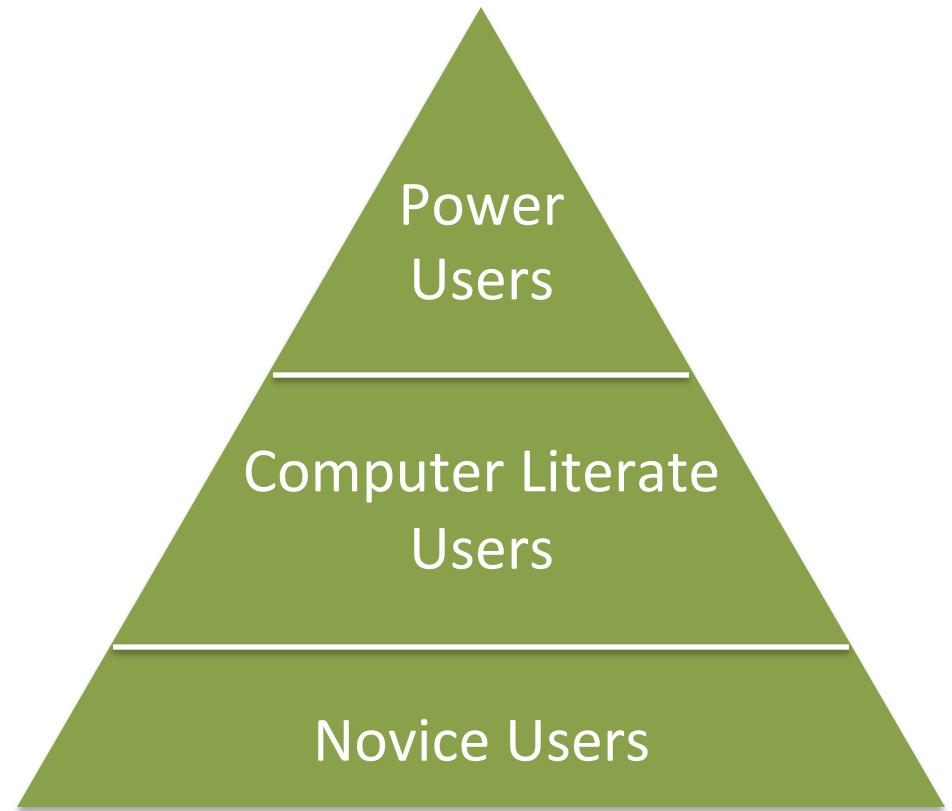
Microsoft Kin

“Tia always wants to know what cool things her friends are up to”

- 16 years old
- From La Jolla, CA
- Loves all things pink
- 2 sisters, Diana & Ashley
- Was Juliet in last year's school performance of "Romeo & Juliet"

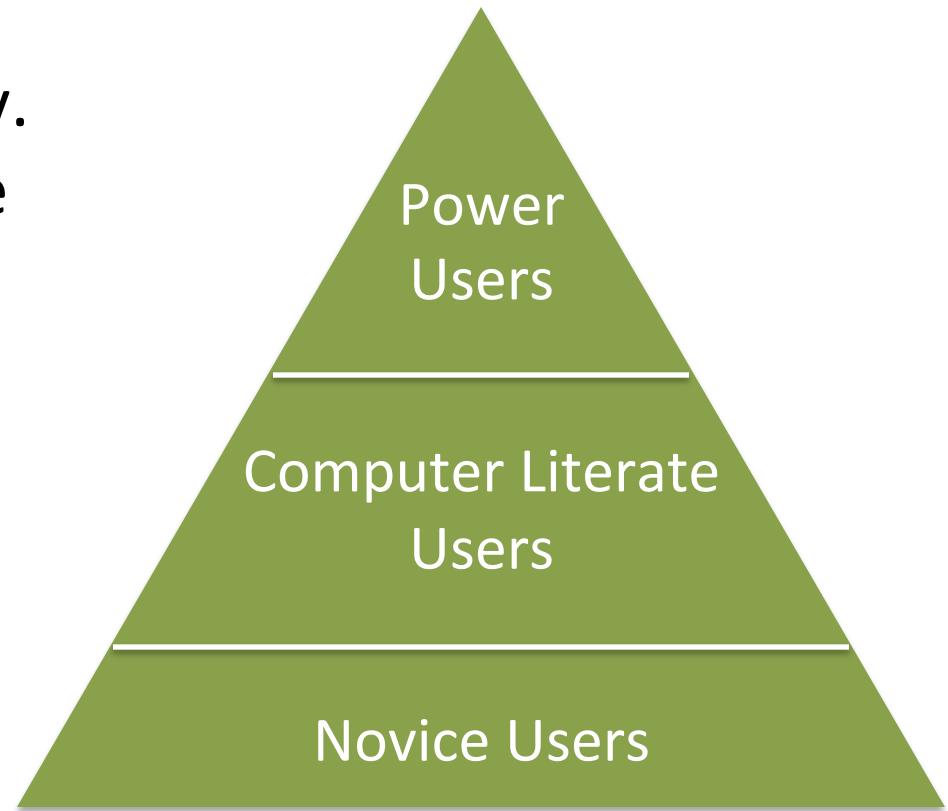


Types of users



Types of users

“Elise is a 33-year-old accountant who uses Microsoft Excel every day. She likes to watch ‘House of Cards’ on her iPhone before bed, but has had trouble connecting her email to her phone. She goes hiking nearly every weekend.”



Designing with Personas

- Design to make the “primary” persona(s) happy
- Avoid design choices that make personas unhappy

Why use Personas?

Thoroughly think about who is using your product

Ensure the design is effective for those people

Make the product and its impacts “real”

Cultural Probes & Diary Studies



design:
use:
build:

Self-Report Data

Minimal influence on actions

Event takes place over a long period of time

Diary Study

6 FRIDAY EVENING

1 Male Head of House	2 Female Head of House	Chumashite									9 TV on but no one Watching/Listening
		3	4	5	6	7	8	9	10	11	

Time Quarter-Hours	TV SET OFF	ON	Station or Channel Name	Chan. No.	Name of Program or Movie	1	2	3	4	5	6	7	8	9
49 5 PM	:00-14	X				M	F							
50	:15-29					A	E							
51	:30-44					L	M							
52	:45-59					E	A							
53 6 PM	:00-14						L							
54	:15-29					H	E							
55	:30-44					E								
56	:45-59					A	H							
57 7 PM	:00-14					D	E							
58	:15-29					O	A							
59	:30-44					D	D							
60	:45-59					F								
61 8 PM	:00-14	X	CW	S	Smallville (Harvest)	X	X							
62	:15-29			I		I	F							
63	:30-44					U	H							
64	:45-59			N		S	D							
65 9 PM	:00-14	X	N/A	N/A	Purchased DVDs Smallville	G	E	U						
66	:15-29					S	D							
67	:30-44					E	U							
68	:45-59					S	M							
69 10 PM	:00-14													
70	:15-29													
71	:30-44													
72	:45-59		HGTV	39	House Hunters	V	X	3	4	5	6	7	8	9

Cultural Probe



December 2012

	Limit	Balance	Due	Bank
12/4 USA Premier	\$6,227.00	\$5,140.00	12/30	
12/6 Visa Reserve	50,247.00	39,30.00	2/23/13	
12/6 bt Premier add'l/bt	216.00	205.99	12/5	
USA Cash Advance		5,200.00	2/5/13	
Taxed	30.00	2	12/6	
12/8 Almond Storage		\$100.00	12/10	
12/11 Almond Storage		10.00	12/10	
12/17 Cite Card	3,985.19	1,082.28	11/10/06	
12/18 Best Buy	2,884.18	96.00	12/10	
12/17 JCP	28.00	19.15	12/10	
12/17 Cup 1 W	2,000.00	2,000.00	11/10/06	
esterCap 1 (2)	200.00	20.00	12/10	
12/19 Orchard Bank	100,000.00	97,131.00	12/10	
12/21 Tj Maxx	60.00	19.58	12/10	
Victoria's Secret	120.00	31.28	12/10	
12/25 Wal-Mart	200.00	195.14	12/10	
ReliaTrans Union		9.95	9.95	



Why use Diary Studies & Cultural Probes?

Learn about your [potential] user's habits

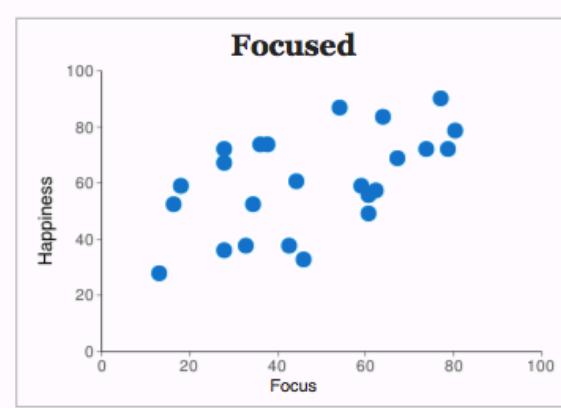
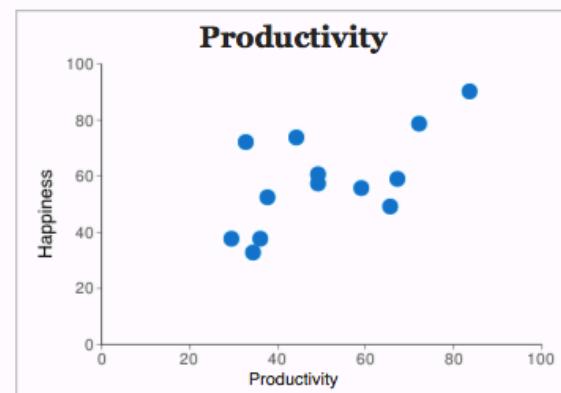
Artifacts reflect how people currently do something

Contextual Inquiry with a record

Experience Sampling Method



design:
use:
build:



Why use Experience Sampling?

Learn about your [potential] user's habits

Learn what influences these habits

Diary studies with prompting