



Introduction to User-Centered Design

Lecture 4 -Understanding phase part 3

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Outline of this lecture

Goals Lecture 1

Part 1: More research methods

- Card sorting
- Diary studies
- Focus groups
- Surveys

Part 2: Summing up activities so far

- Interviews / observation

Part 3: Analysis and outcome

- Affinity diagram
- Personas
- Empathy maps
- Problem statements - Requirements

Part 1

1

More research methods

- Card sorting
- Focus groups
- Diary studies
- Surveys

Card sorting

What is Card sorting?

Card sorting

What is it?

A method that helps you understand how people organise and prioritise information

Often used in information architecture

- Useful in the latter stages of development but can also be applied during the understanding phase
- Can reveal mental models

Example

Exercise or connectedness scenarios on cards



How is it done?

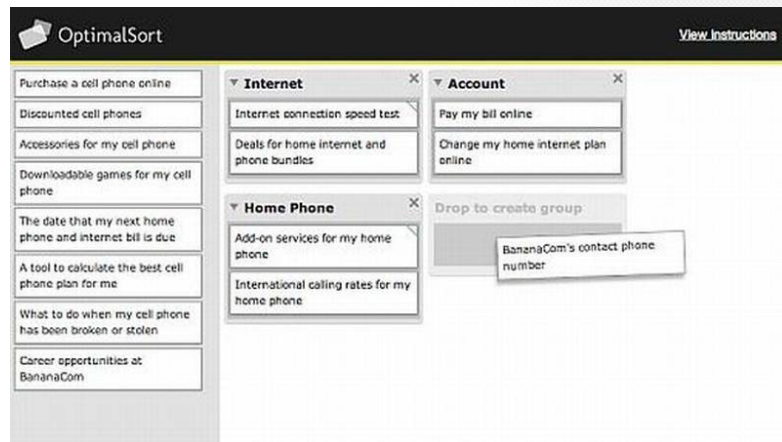
Card sorting

Participant groups individual labels written on notecards according to criteria that make sense to them.

- Either physical on a table or board
- Or digital with online tools

Highlights common structures across users as well as differences between user groups

Allows user participation (by adding new cards and categories)



Types of Card sorting?

Card sorting

Closed card sorting

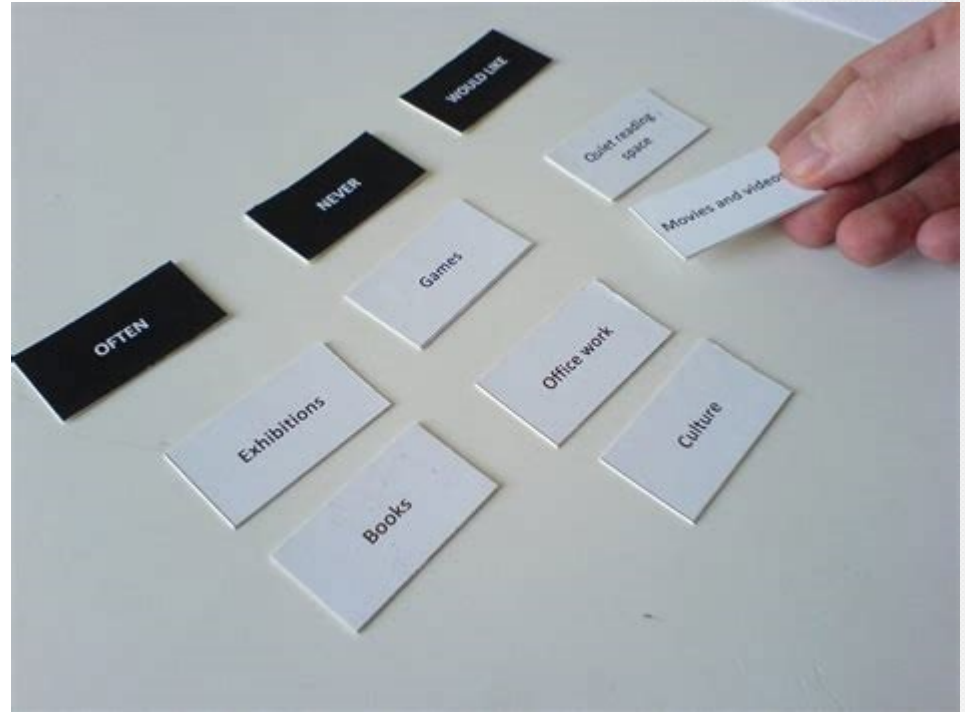
Categories are provided beforehand, and participants add cards to them

Open card sorting

Categories are created by participants

Hybrid card sorting

Categories are provided beforehand, but participants can add their own



Diary studies

What are diary studies?

Diary studies

What is it?

A method that allows you to collect data in situ longitudinal data over a large sample

Example

Longitudinal study of how people use technology to connect to each other.

- When observations are difficult
- When the behavior we study is sporadic



What are diary studies?

Diary studies

What does it mean practically

Usually, participants are asked to self-report periodically about **the thing** we are interested in over an extended period of time

Examples

- We give a notebook to participants to report their mental state during a new treatment trial
- We ask people to rate how satisfied they feel on 5-point scale every time they interact with a mobile application

This allows us to observe indirectly behaviour, feelings, experience in real time and in their natural setting

Focus Groups

What are Focus groups?

Focus groups

What is it?

Group interviews with 5 to 10 people that are discussing in the same room (usually) their experiences and opinions around topics

Often used in marketing



What are Focus groups?

Focus groups

Can be used in a variety of ways but is best suited to assess user needs and feeling about existing products or conceptual ones you present to them

- Not necessarily better than interviews
- Group dynamics have to be considered
- Participants may disclose less in a group
- Requires an experienced facilitator

Pros

Can bring different stakeholders around the same table

You can bring probes, prompts, tasks, prototypes

Variation = Workshops, Participatory design workshops

Surveys

What are surveys?

Surveys

A collection of information in standardised form from groups of people (usually a large number)

- Could be a brief interview (in person, on the street, by phone)
- Could be a paper or online questionnaire



What are surveys?

More research methods

Usually Involves

- collection of a small amount of data from a large group of people
- the format is structured and standardised
- Usually, questionnaires are structured interviews

Very common in HCI: surveys are considered questionnaires!

Likert Scale

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The website was easy to navigate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The checkout process was simple	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The product I received was what I expected	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

When are Surveys Appropriate?

surveys

When we need to say something about the entire population of something

- to measure differences between groups of people
- to identify changes over time in people's attitudes and experiences

Be careful about:

- Questionnaire design and bias
- Sampling

When Surveys Are Appropriate (Examples)

surveys

People's Attitudes, Beliefs and Perceptions:

- “What do you think about the new Facebook interface?”
- “How would you evaluate me as a lecturer?”
- “What is your opinion about refugees?”

People's Behaviors. We focus on past or future (intended) behaviour:

- “How often did you go to the gym last week?”
- “How many hours did you spend watching TV yesterday?”
- “How many children do you plan to have?”

People's Facts and Demographics.

- Age, gender, ethnicity, prior experience...

Some of those are badly phrased. We will come back to that

When Surveys Are Not Appropriate?

surveys

Surveys look like very easy to do. (They can be).

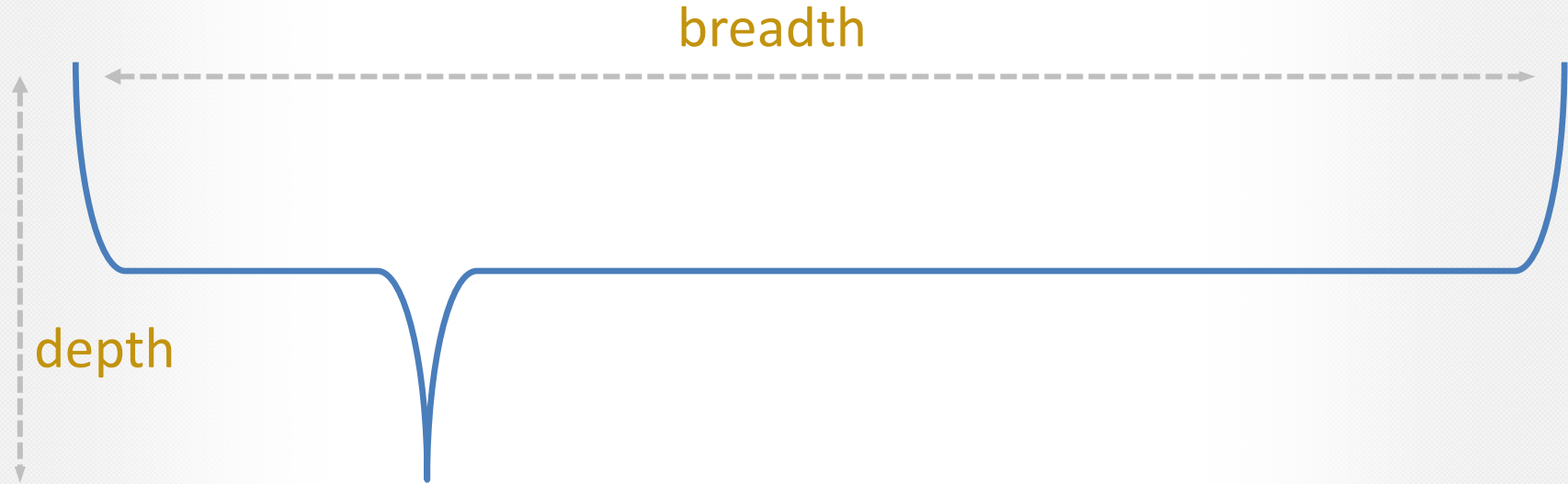
But they are not always the most appropriate research method

Surveys are not appropriate if we need to learn about.

- **Precise behaviors** (better use logging data)
- **Underlying motivations** (better do ethnography or contextual inquiry)
- **Usability evaluations** (better use usability testing)
- **Rich and in-depth feedback about design** (better do observations, interviews)

Questionnaires vs. Interviews

Surveys vs Interviews



- If you want breadth it is better to use questionnaires
- If you want depth, it is better to use interviews

Surveys Pros and Cons

surveys

Advantages:

- Cheap
- Quicker to administer,
- Easier to collect and analyze data
- No interviewer effects
- No interviewer variability
- Convenient for the responders

Disadvantages:

- Cannot provide help if someone does not understand something
- Cannot ask them to elaborate on something
- Cannot ask too many questions
- Often, the participants can read the whole questionnaire
- Often, we do not know who answers
- Greater risk of missing data
- Low response rates

Your own questionnaires vs. established ones

surveys

When measuring attitudes or perceptions, it is better to look for established questionnaires instead of creating our own.

Examples

Established User Experience Questionnaires:

- **Aesthetics Scale** (classic and expressive aesthetics)
- **Attractiveness Questionnaire** (attractiveness)
- **Attrakdiff2** (hedonic and pragmatic quality)
- **SUS Questionnaire** (usability)
- **Pleasure with Products Questionnaire** (pleasure)

SUS System Usability Scale (strongly agree/strongly disagree 1-5)

surveys

- I think that I would like to use this system frequently
- I found the system unnecessarily complex.
- I thought the system was easy to use
- I think that I would need the support of a technical person to be able to use this system
- I found the various functions in this system were well integrated
- I thought there was too much inconsistency in this system.
- I would imagine that most people would learn to use this system very quickly
- I found the system very cumbersome to use
- I felt very confident using the system
- I needed to learn a lot of things before I could get going with this system

Question

Lecture 3

Question:

How many have chosen to conduct:

- Observations
- Interviews
- None of the above

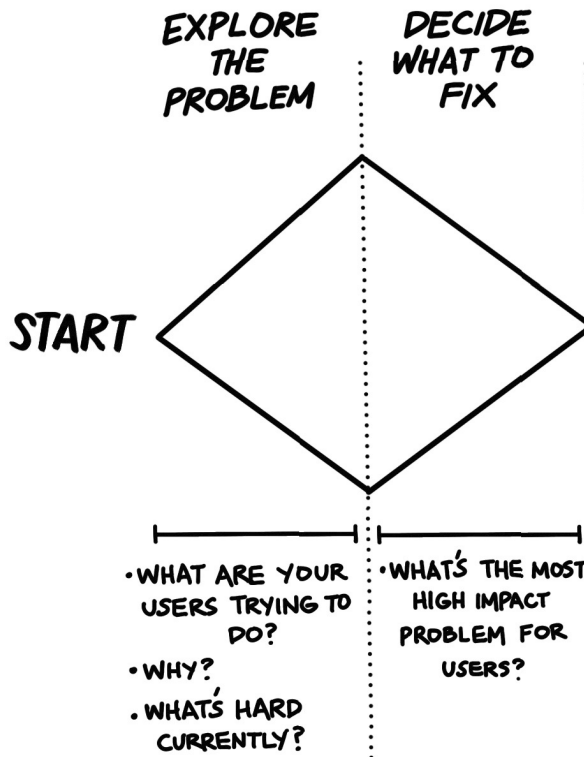
Part 2

2 **Summing up** (interviews/observations)

What has been done last week

Where are we in the process

General introduction



After finishing the analysis of our research, you should decide on your final problem statement

- We are still not thinking about solutions
- Still trying to identify a problem, but we start to converge
- Based on our research, what is the highest impact problem
- Prepare for the next phase by organising, summering our research

Examples

Explorations of the Connectedness problem space

Connectedness

- What?
- Who?
- Where?
- When?
- Why?

Be more connected to family far away
Elderly
Elderly homes
Everyday, no special occasions
Feel connected and part of the lives of remote family members

Academic research

Intergenerational interaction - communication

Where is friction?

Where are the problems?

What are the opportunities?

- No proximity, no frequency,
- no common tasks Interest gap,
- nothing to talk about
- Opportunity: online activities/ communication
- Familiarity with technology

Examples

Explorations of the Connectedness problem space

Connectedness

Preliminary problem statements

How can we help grandparents engage in common activities with grandchildren that live far away?

How can we help grandparents increase their interaction with remote family members through fun activities?

How can we help grandparents to feel useful and part of their grandchildren's lives?

Identified through
desk research

Examples

Explorations of the Connectedness problem space

Connectedness

During User research

Let's say you found out that elderly people feel lonelier over the weekends. And most of the people you interviewed talked about wanting to enjoy conversations and have fun with their grandchildren. But caretakers at the elderly home told you that the people there are not very technological savvy. You also observed that the elderly patiently worked on puzzles and crossword puzzles in the common room.

Examples

Explorations of the Connectedness problem space

Connectedness

Preliminary problem statements

How can we help grandparents engage in common activities with grandchildren that live far away?

How can we help grandparents increase their interaction with remote family members through fun weekend activities?

How can we help grandparents to feel useful and part of their grandchildren's lives?

This looks like
having a higher
impact

Examples

Explorations of the Connectedness problem space

Connectedness

During User research

Let's say you found out that elderly people feel lonelier over the weekends. And most of the people you interviewed talked about wanting to enjoy conversations and have fun with their grandchildren. Put caretakers at the elderly home told you that technology skills they the people are not very technological savvy. You also observed that the elderly patiently worked on puzzles and crossword puzzles in the common room.

What about this insight



Examples

Explorations of the Connectedness problem space

Even though you may converge on a specific problem, you do not throw away your research.

- You will need it in all upcoming phases
- Therefore you need to summarize and organise the outcomes in a way that will be helpful for the next step
- Research should not stop (ideally)

In the ideation phase, you may consider creating a tablet application for online puzzle games that kids and grandparents play together.

But you may not have considered if this would be attractive to the kids. (More research may be needed)

Question

Lecture 3

Question:

You have done some observations or interviews. Are those insights?

What is missing?

Part 3

3 Analysis and outcome

- Affinity diagram
- Personas
- Empathy maps
- Problem statements - Requirements

Affinity diagram

Affinity diagram

Analysis and outcome

UX RESEARCH SYNTHESIS USING AFFINITY DIAGRAMMING

1

Extract and summarize data



Write **key information** from notes, transcripts, and artifacts on sticky notes. The small size of a sticky note force you to **summarize** information into key takeaways. Use each sticky note for one takeaway.

2

Find patterns across participants

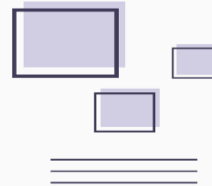


After extracting all information into sticky notes, **cluster** similar information into **themes**.

Label these themes. As a starting point, you might label information based on **broad categories** such as demographic, pain points, etc.

3

Create insights



Ask yourself for how different data might relate to each other, what's the underlying reason for different behaviors and needs. Rearrange sticky notes into **themes of insights**. You can also write a **user need statement** for each theme: [A user] needs [need] in order to accomplish [goal].

4

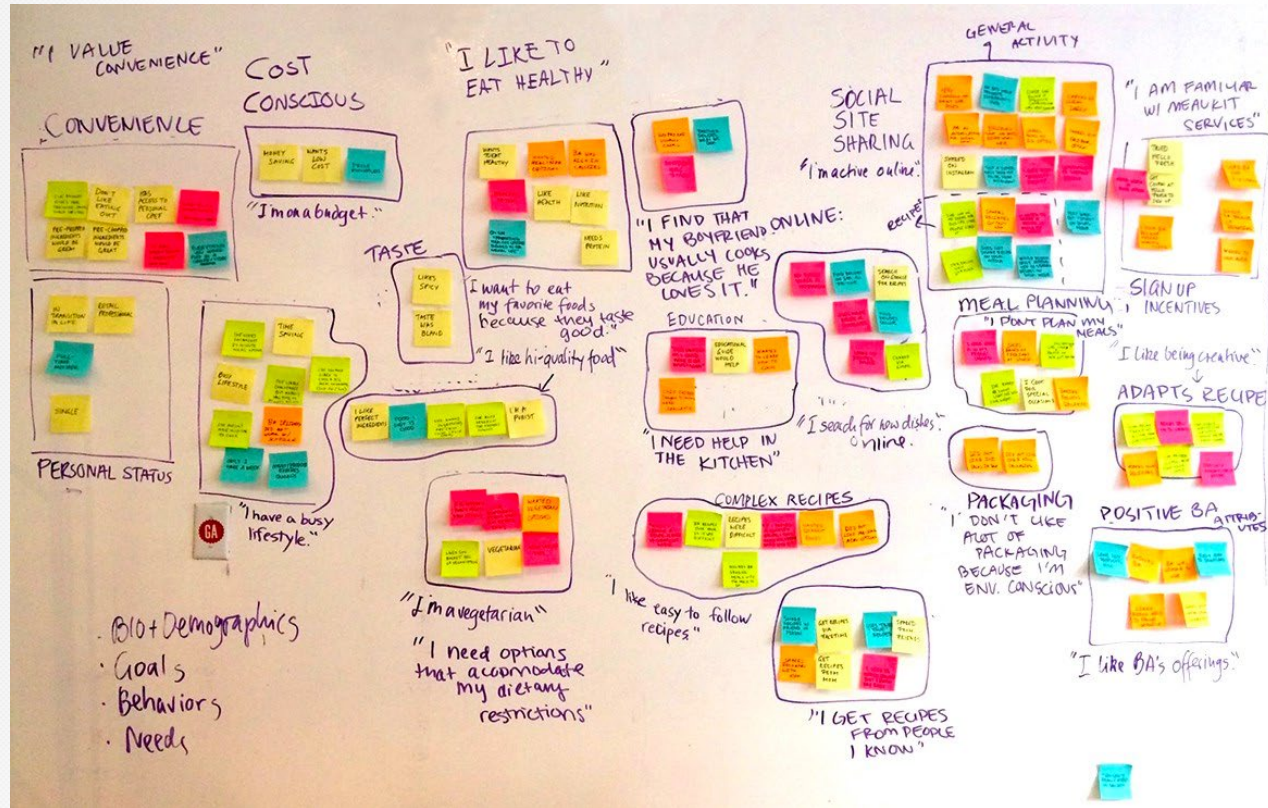
Organize insights into a digestible format



Finally, **organize** insights and themes of information into **digestible research artifacts** to present to others. Common artifacts in UX research are user persona, journey map, service blueprint and empathy map.

Affinity diagram (Research wall)

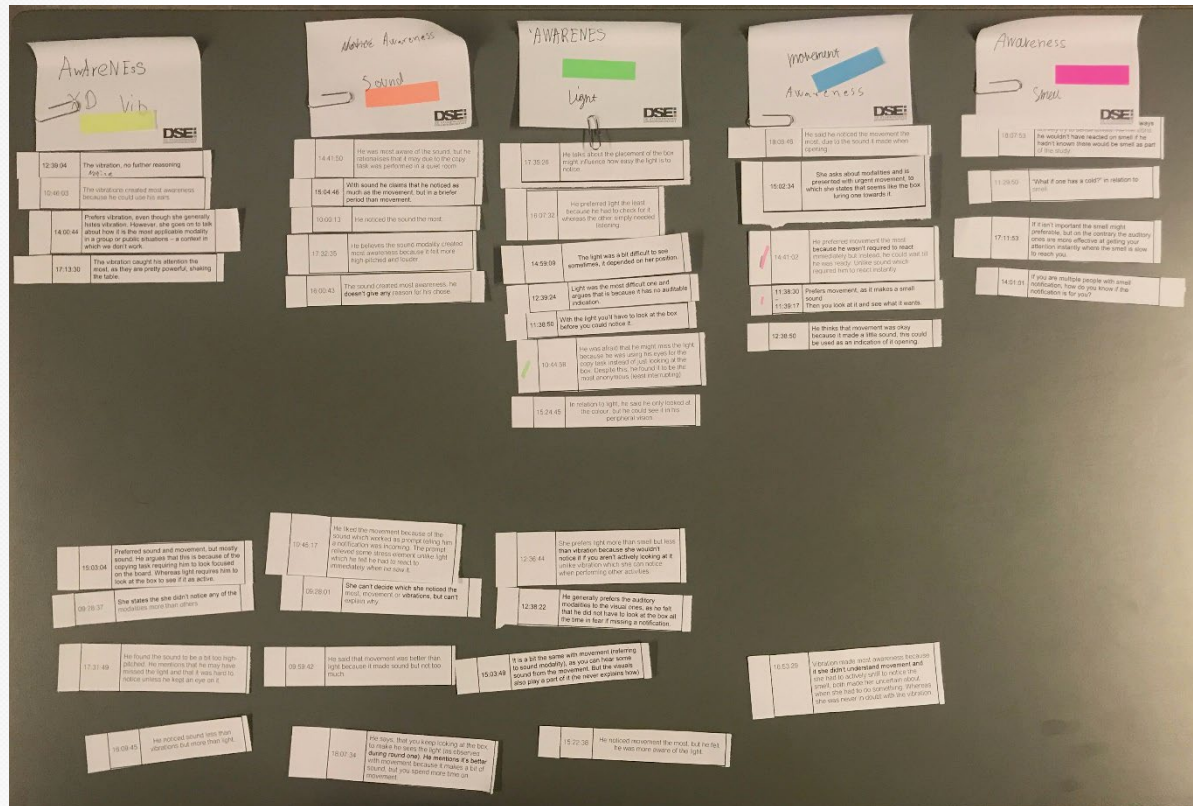
Analysis and outcome



Physical

Affinity diagram (table)

Analysis and outcome



Affinity diagram (table)

Analysis and outcome



Physical

Affinity diagram (digital)

Analysis and outcome



Personas

Personas

Analysis and outcome

Tool to create empathy for your users and their needs

- Archetypes. Representations that reflect patterns based on behaviour, goals attitudes and other variables
- Gathers your insights into realistic and recognisable semi-fictional characters with personality traits, needs, motivation and goals of the user in focus
- Always based on research!

“Personas are the handle you use to grab hold of what you learned from your research. They humanize the context, background, and motivations of your users.”

(Cooper et al., 2014)

Personas

Analysis and outcome



MARK, 22

DEMOGRAPHICS

- Rents a 2 bedroom apartment in uptown Charlotte, NC with old teammates from lacrosse.
- Currently an intern for a large sports management company and a bar tender at a high end cocktail bar on the weekends.
- Recently single and using dating apps. An only child and rescued a puppy 4 months ago.
- Graduated with a 3.8 in Health Sciences from UNCW. Owes \$28,000 in private loans.

BEHAVIORAL IDENTIFIERS

- Hobbies include eating out, lifting weights, playing club lacrosse, drinking draft beer, talking for UNC and watching live music.
- Wants fast shipping. Values a low price. Prefers online marketing, light colors, and simple websites.
- Owns an Android and shops on mobile with referrals from social media such as Instagram and Facebook.
- Personal goals to be out of debt by 2024, to be engaged in 4 years, and to work in a university sports medicine department.
- Prefers chat systems for customer service and support. Values quick responses and 24 hour availability.
- Shops online between 7pm-3am. Buys during pay periods at the end of the month and often uses promo codes.
- Studied abroad in Chile. Can speak Spanish and some Italian. Travels on a budget and prefers hostels to hotels.
- Very fit and active but has a bad diet due to eating on a budget and drinking often. Seeks out health information daily.



JUSTIN, 31

DEMOGRAPHICS

- Rents a 1 bedroom apartment in uptown Atlanta with his partner. Saving to buy a home next year.
- Works 40 hours a week in a 5 star hotel as a superintendent with a net income of \$320,000.
- Recently engaged to his boyfriend of 5 years with plans to marry in NYC in the winter.
- Graduated from a community college with honors and held office in 3 on-campus clubs.

BEHAVIORAL IDENTIFIERS

- Hobbies include vegan cooking, yoga, monthly massages, playing the drums, volunteering, drinking cocktails and watching local plays.
- Wants free shipping on large orders. Values quality and privacy. Extremely brand loyal. Prefers email marketing.
- Owns an iPhone and tablet. Shops on this tablet with referrals from email marketing and promotions.
- Personal goals to become a general manager within 4 years and to purchase a suburban home after his wedding and honeymoon.
- Prefers to call for customer service and support. Values follow up summary emails and easy to read directions.
- Shops online between 9am-3pm and makes multiple returns. Uses PayPal at checkout.
- Travels in the USA twice a year to visit family in Maine and California. Prefers long road trips and holiday travel.
- Cooks very healthy and with local products. Has great self care and is very active.



MAGGIE, 52

DEMOGRAPHICS

- Owns a 4 bedroom home in coastal NC and 2 high end cars. Lives in a suburban gated neighborhood.
- Human Resource Director of a small media company for 5 years with a \$68,000 salary.
- Happily married for 12 years with 2 sons and a house hold income of above \$220,000.
- Well educated with an HR degree from a state university. Graduated without debt.

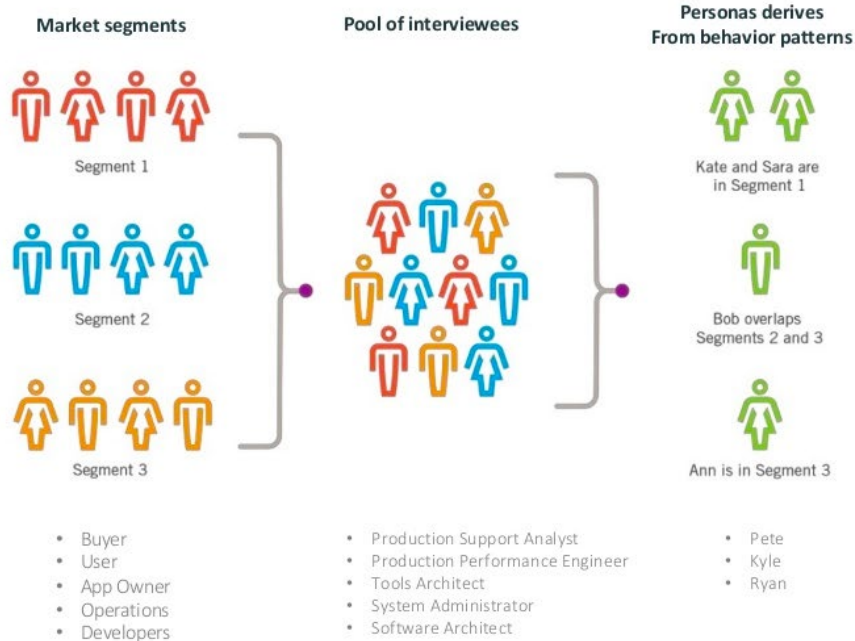
BEHAVIORAL IDENTIFIERS

- Hobbies include reading, playing tennis, networking at the country club, being involved in youth groups and visiting the beach.
- Wants a simple product. Values quantity and brand image. Prefers print marketing and bold graphics.
- Owns an iPhone but makes purchases online with a desktop Mac computer. Needs a simple check out system.
- Personal goals to retire by age 65, to own a vacation home on the Spanish Riviera and for her sons to attend an ivy league university.
- Strong need for customer service and support. Values face to face communication and rewards systems.
- Shops in department stores after 5pm. Buys in bulk on sale items. Reflected by a previous client.
- Well traveled in Europe. Prefers traveling in off peak times in chain hotels and loves pre-planned travel like cruises.
- In very good health but very busy and often stressed. Visits group exercise programs.

Personas

Analysis and outcome

Personas are not market segments



Personas

Analysis and outcome



TIP!

Read (and hear) about how Spotify developed their personas

<https://spotify.design/article/the-story-of-spotify-personas>

Personas

Analysis and outcome

Tips

- Keep it simple
- keep it visual
- User pictures (but no models or stock photos)
- Use bullets
- Only keep useful information (that helps empathise)

And remember

- Should be based on your research
- **This is not where your research ends. It is only a tool to be used in the next phases**



Empathy map

Empathy map

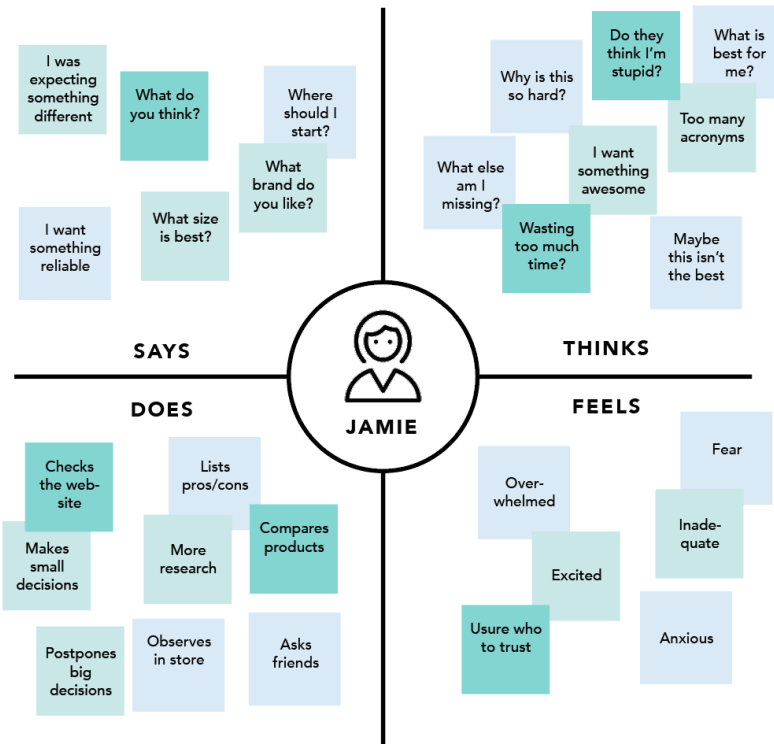
Analysis and outcome

Empathy map: is a method used to visualise what the user says, does, hears and thinks

- Say and do – things that are explicitly done and can be observed
- Think and feel – not always apparent, revealed through conversational interviews

The map gives the project team a common understanding of the user in a given context

EMPATHY MAP *Example (Buying a TV)*

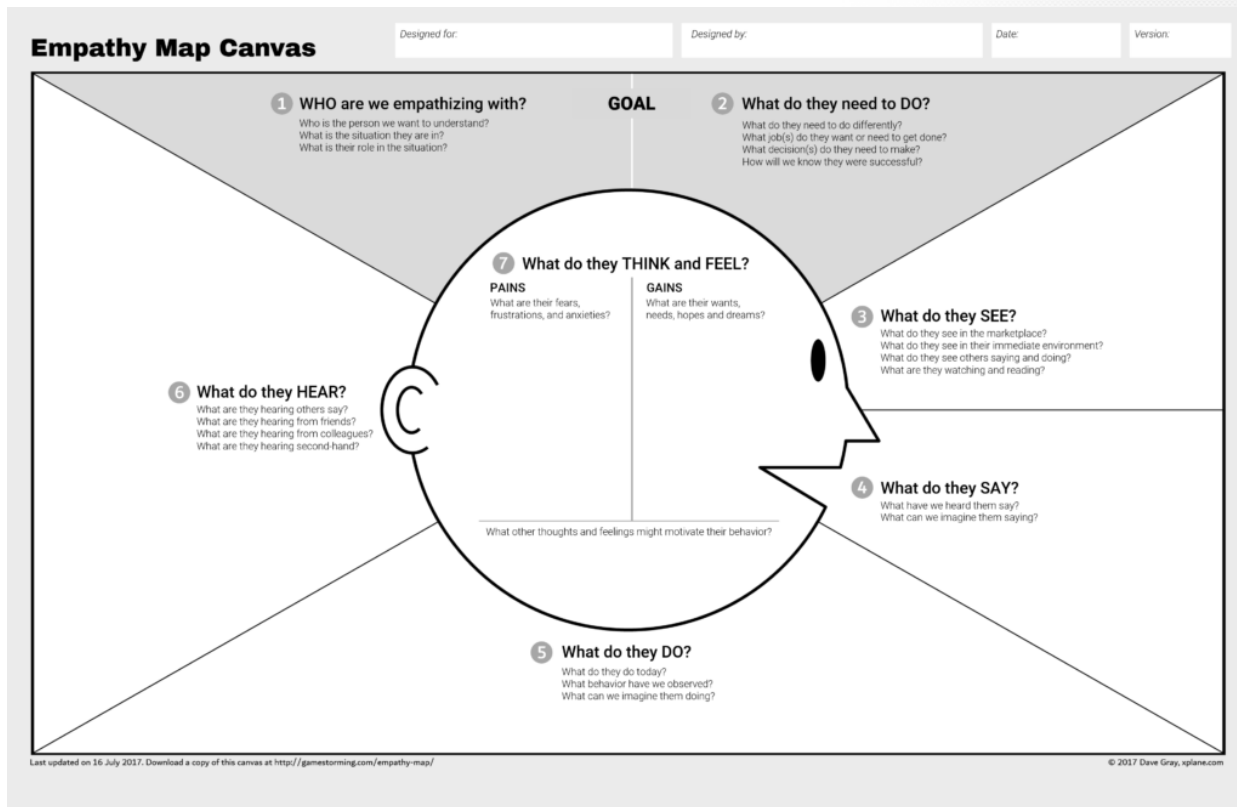


Empathy map

Analysis and outcome

Some empathy maps also include pains and gains (outcomes of the experience)

You can have one empathy map for each of you personas or user type



Problem statements - Requirements

Insights : *the ability to achieve a precise and intuitive understanding of people's needs, actions and attitudes*

Insight are not data **but** data analysis can reveal insight to act on

- An observation alone is not an insight
- A customer wish or statement of needs is not an insight

Insight is a discovery about the underlying motivations and rationales that drives people's actions

From insights to problem statement

Problem statements - Requirements

A successful product team is focused on solving a clearly framed, common design problem.

A good design problem statement will leave room for creativity, but it ultimately provides a clear lens through which to view each element of the project.

A design problem is an unmet need that, if met, can satisfy the user's purpose



From insights to problem statement



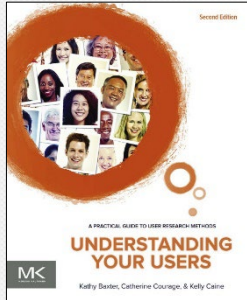
Problem statements - Requirements

1. Create insights by **analysing your findings** using an affinity diagram.
2. Use insights from all your research to **refine your problem statement**
3. **Decide collectively** which problem statement has the **highest potential** impact on your users
4. **Pick one** problems statement that you will focus on in the next phase
5. **Develop personas and or empathy maps.** (those will be very useful in the ideation phase)

Reading material for this Lecture

exercise

Reading



Baxter, Courage, Caine **Understanding your Users**

- **Chapter 1 and 2**

I will provide additional external resources in the lecture slides

For the Lab session

project

Meet up in the Lab rooms and prepare to analyse User Research (primary research)

- First, create an affinity diagram using paper cut-outs and/or sticky notes
- Try to identify themes and general insights
- Use those to refine your problem statements
- Collectively choose one problem statement.
- If there is time, create personas or empathy maps



Don't forget to take pictures of your affinity diagram

Obligatory assignment 1

Oblig 1

Work in groups and deliver (one submission per group)

- Write a report (max five pages) that summarises your activities over the previous four weeks
- Use pictures and diagrams where needed to document your process
- Be reflective about your process from brainstorming to insight to the problem statement
- What type of research did you conduct and why, what users did you approach and how did you come to reach the design problem

Deadline:
September 21

Submit:
Blackboard

One
submission
per group

Obligatory assignment 1

Oblig 1

What to include

1. Short group introduction
2. The initial choice of the problem (e.g. recycling) and why did you choose it
3. How did you explore the problem space (brainstorming)
4. List the research papers and your sources of applied research (why did you choose those, what did you learn from them that was useful)
5. List your initial problem statements
6. Describe what you did in the user research phase and why?
7. Describe your analysis and what insights you extracted
8. Write the final problem statement and how did you choose it
9. Appendix (Observation or interview guide)

Deadline:
September 21

Submit:
Blackboard

One
submission
per group

**There is a
template on
blackboard**

Thank you

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