

# Introduction to User-Centered Design

Lecture 5 - Ideation

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# Today's lecture

Goals Lecture 5



## What will you learn?

Move from problem statements toward ideas/specific solutions/conceptual design (generate multiple)

- Gain hands-on experience with a variety of ideation techniques
- Generate ideas
- How to represent ideas (e.g., text, concept, sketch)
- Evaluation of ideas (more next time)

# Outline of this lecture

Goals Lecture 1

## Part 1: Summing up activities so far

- Understanding phase, problem statement
- What now?

## Part 2: What is ideation

- General Introduction
- Principles
- Idea documentation techniques

## Part 3: Methods

- Idea creation
- Sorting of ideas?

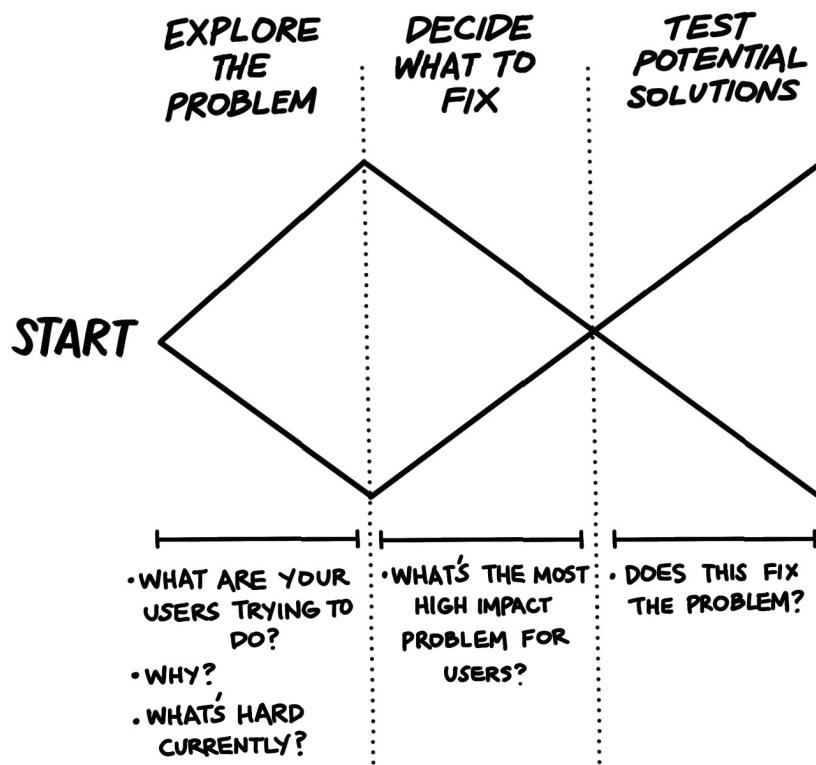
## Part 1

### 1 Summing up activities so far

- Understanding phase, problem statement
- What now?

# Where are we in the process

process

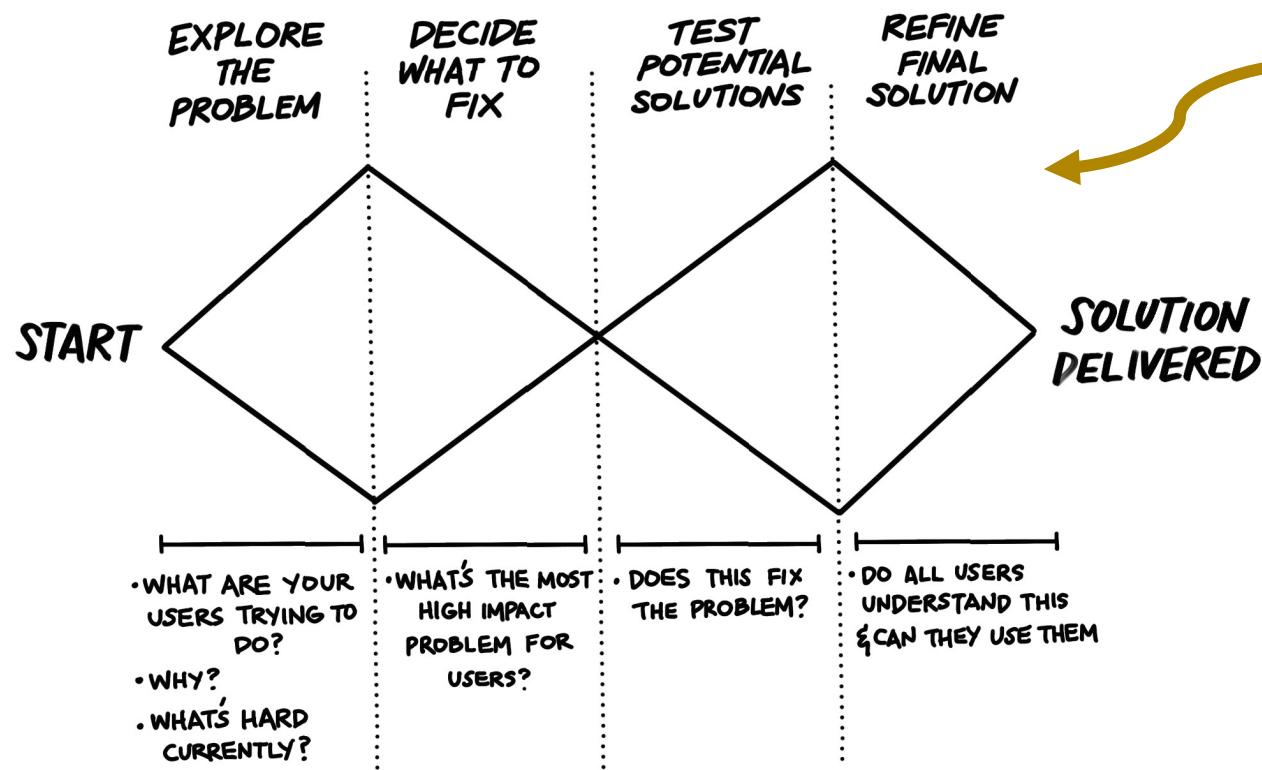


We finished the understanding phase and entered ideation

- We start thinking about solutions
- The goal is first to generate as many solutions as possible
- Select one or a few that will be further developed in the prototyping phase

# Where are we in the process

process



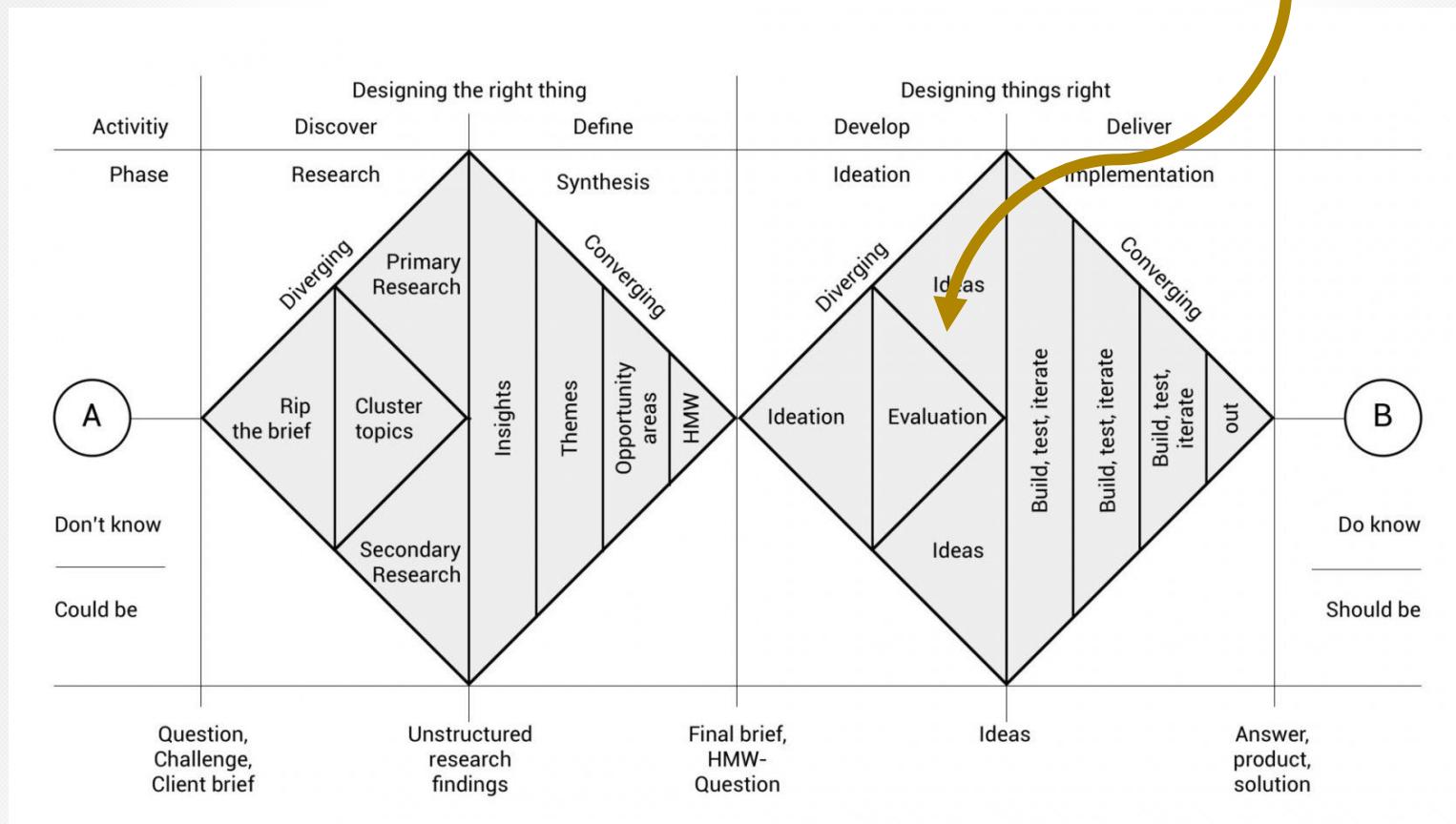
This does not reflect the process so well anymore

- Usually only a few ideas are prototyped
- Prototyping and developing are different phases
- There is no testing

# Where are we in the process

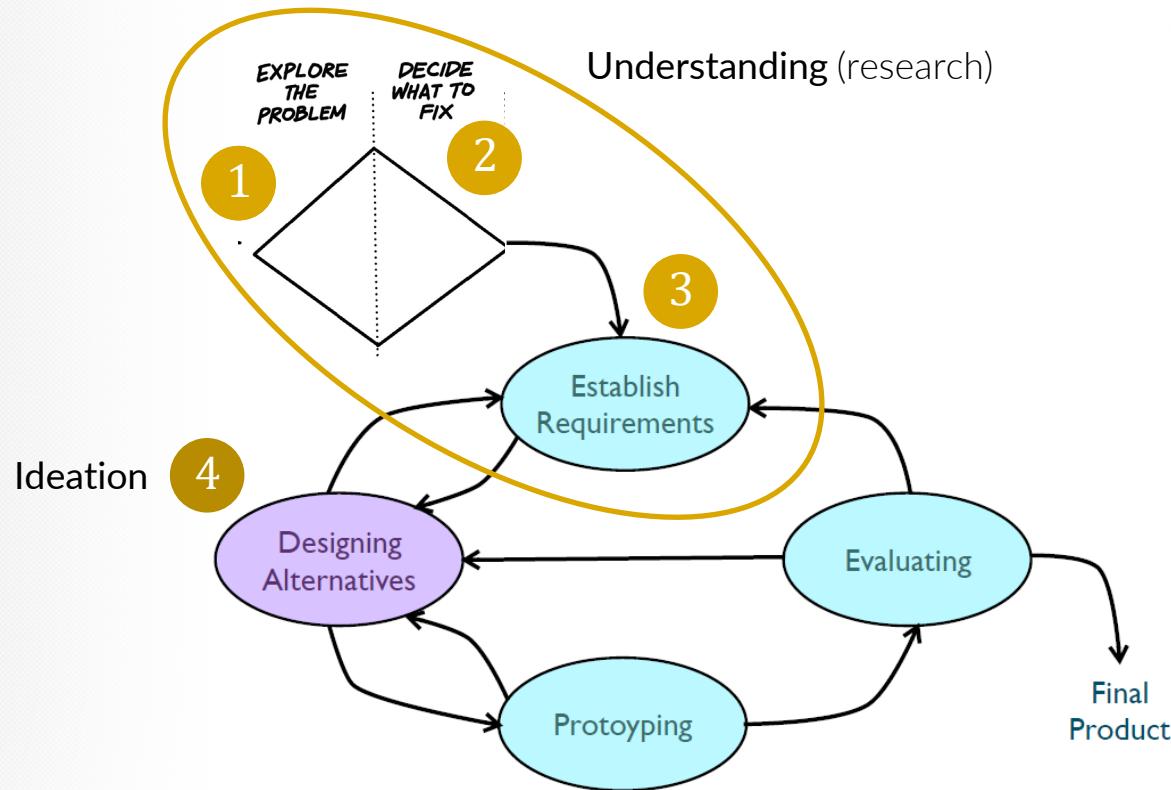
process

Mini Diamond



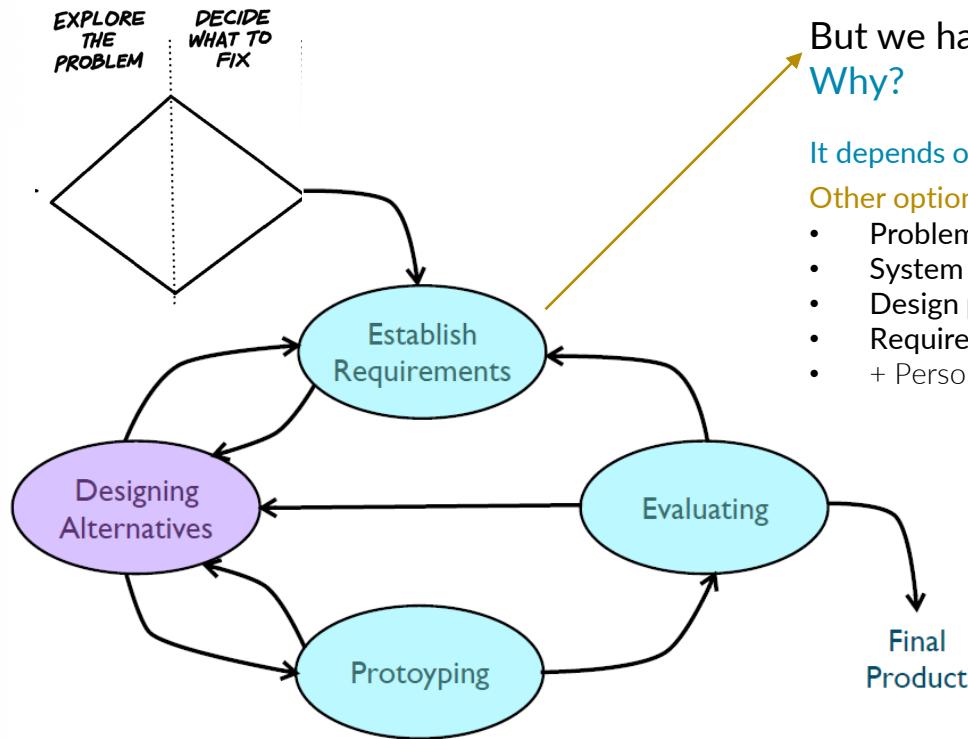
# Where are we in the process

process



# Where are we in the process

process



But we have a problem statement.  
Why?

It depends on the project

Other options:

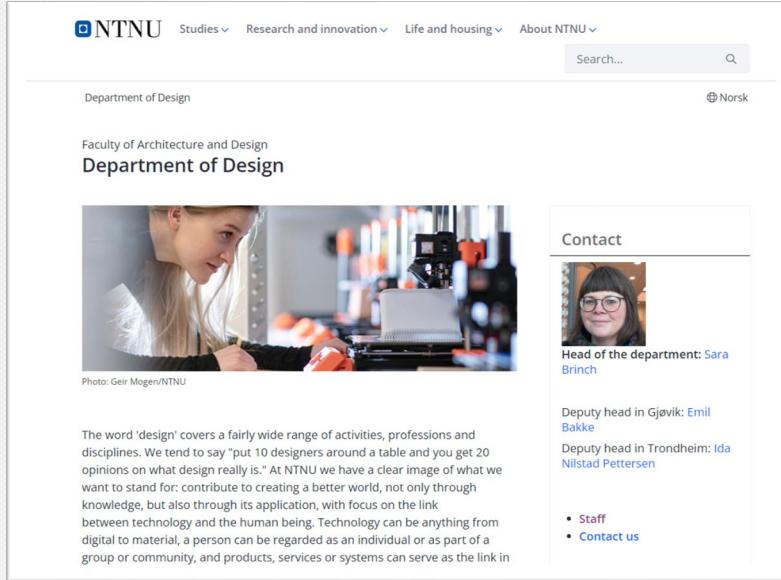
- Problem statement
- System definition
- Design problem
- Requirements (functional, non-functional)
- + Personas, empathy map ...

# Challenge

instructions

## Redesign the Design Department website:

to make it easier to use for candidate students and to understand what it means to study at the design department of NTNU <https://www.ntnu.edu/design/>



The screenshot shows the homepage of the NTNU Design Department. At the top, there's a navigation bar with links for NTNU, Studies, Research and innovation, Life and housing, About NTNU, a search bar, and a Norwegian language link. Below the navigation is the department's logo and name, "Department of Design". A large photo of a student working on a 3D printer is prominently displayed. Below the photo is a caption: "Photo: Geir Mogen/NTNU". A text block explains that the word 'design' covers a wide range of activities, professions, and disciplines, emphasizing the link between technology and the human being. To the right, there's a sidebar titled "Contact" featuring a photo of the Head of the department, Sara Brinch, and her name. It also lists the Deputy head in Gjøvik, Emil Bakke, and the Deputy head in Trondheim, Ida Nilstad Pettersen. At the bottom of the sidebar are links for "Staff" and "Contact us".

In groups of 2-3 students

- Discuss the process you would follow. Where would you start?
- What methods would you use?
- Who would you involve?

# Challenge

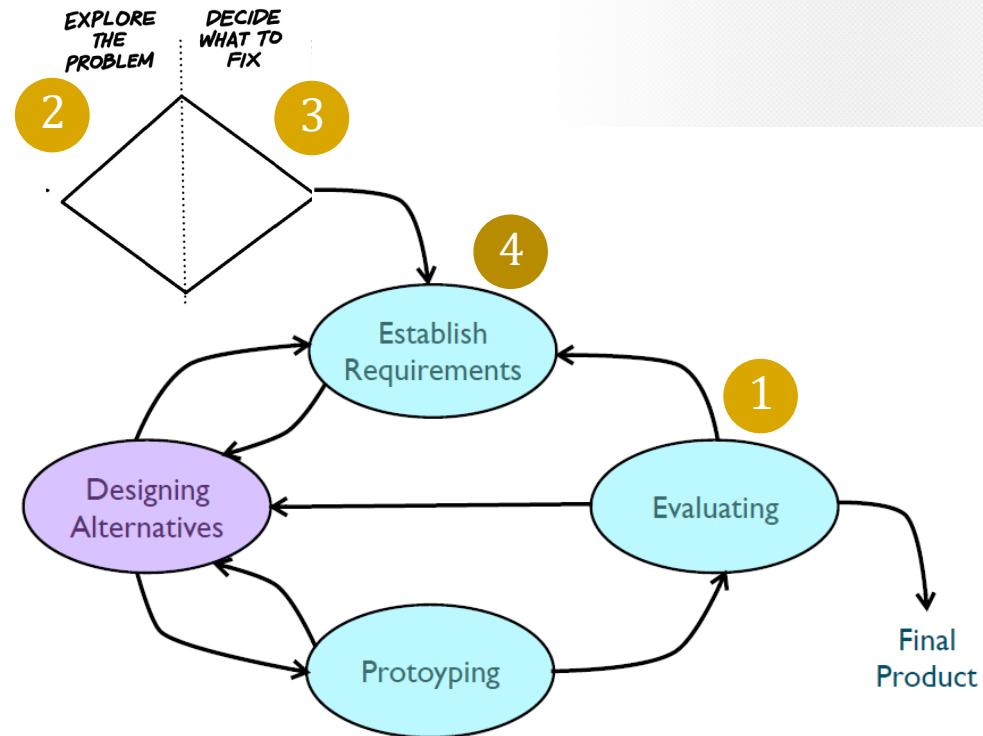
Solutions

Redesign the Design Department website:  
Process. Where would you start

Since the website already exists

- You could get reach feedback about what works and what not by evaluating the website with potential users
- You could combine this with other research activities to understand the problem better

What methods would you use?



# Challenge

Solutions

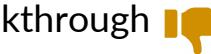
Redesign the Design Department website:  
**Methods. would you use?**

## Desk Research

- Academic research 
- Applied research 
- Competitive Analysis 

Who are your stakeholders?

## User Research

- Evaluation 
- Interviews 
- Observations 
- Contextual inquiry 
- Diary studies 
- Card sorting 
- Artifact walkthrough 
- Focus groups 

# Challenge

## Solutions

Redesign the Design Department website:  
**Who are your stakeholders?**

- Candidate students 1
- Candidate student family members 2
- Active students 3
- Faculty members (teachers, study leaders) 3
- Administration 3
- External researchers
- ...
- General public



All of them are website users and stakeholders  
but  
the one you focus on (based on the problem)  
are in order of importance

# Challenge

## Solutions

### Redesign the Design Department website: Outcome

With those types of problems requirements are better documents to summarize the understanding phase (also more common). Example:

# Requirement	Description	priority	type
R1	The website should have links to Bachelor, Master, PhD programs higher up and more visible	Must have	functional
R2	Visitors should be able to reach information about PhDs in max two clicks	Should have	functional
R3	The aesthetic design should reflect cutting edge research environment	Good to have	non-functional
R4	More pictures about the study environment	Must have	functional
R5	Information about cost of life in Gjovik or Trondheim	should have	functional

# What about your project?

What is next

What do you have? [Connectedness example](#)

Problem statement(s)

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

Additional insights

- Elderly are not too good with technology
- They like puzzles and crossword puzzles
- They are time invested in their leisure activities

And maybe

- Personas
- Empathy map

[Next step Idea generation \(ideation\)](#)

2

Part 2

## What is ideation

- General Introduction
- Principles
- Idea documentation techniques

# What is Ideation?

ideation

## What is it?

The process of creating multiple alternative solution to your problem statement

## Expected result

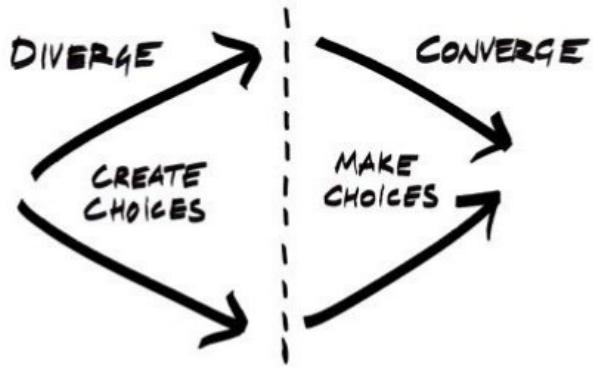
- Idea descriptions (text)
- idea sketches (visualizations),
- map of idea groupings.

Those will be sorted and reduced.

- Create
- Sort
- Reduce
- Vote

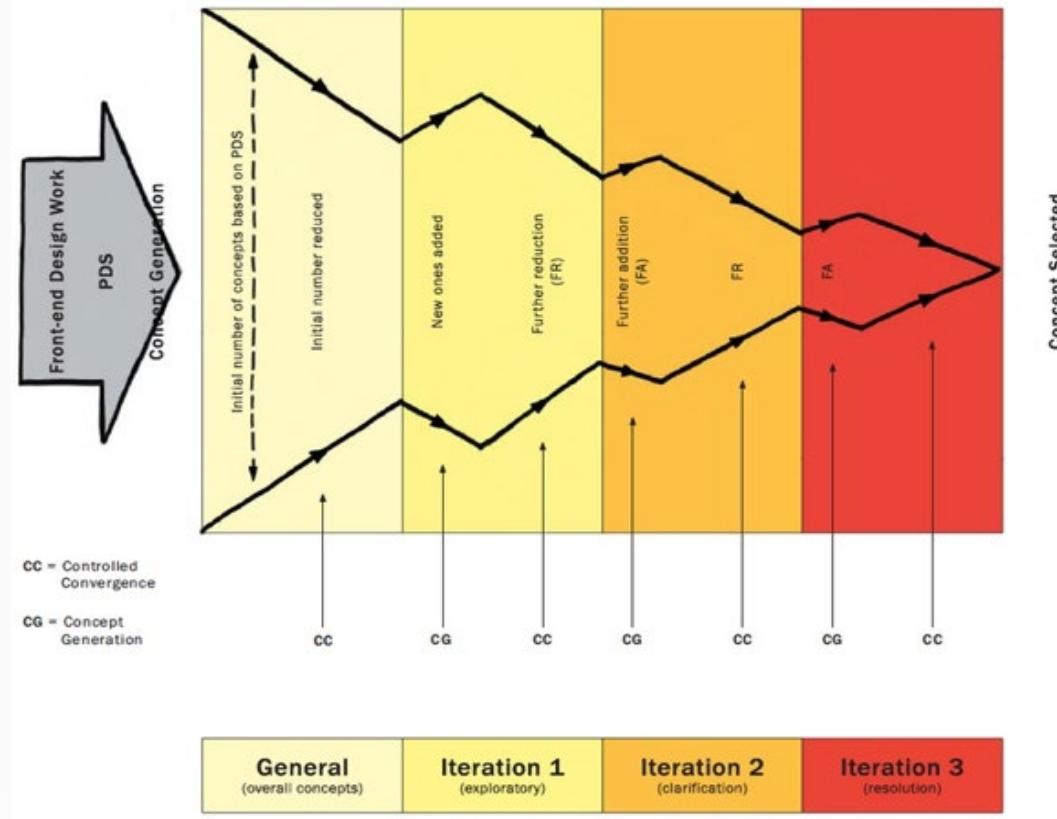
sociomania

## Place of ideation process



# Designing Alternatives

Buxton, Sketching User Experiences (2007)



# Principles

# Ideation Principle 1

Principle



## Rule #1 There are no bad ideas.

### WHAT DOES THAT MEAN?

The key to a good ideation session is that everyone in the room feels comfortable contributing their ideas. How do you get there? By asking everyone to kill judgment completely: no negative thinking, no "yes, but," no nah-faces. If someone hesitates in jotting down an idea, tell them, "At this stage, there are no bad ideas."

Of course, this is easier said than done. When developing new products/services/business units, it's very easy to be tempted by critical thinking. Indeed, initial ideas often just sound absurd - and "this can't work" may immediately jump to mind. However, great business concepts are an unusual combination of (not-so) crazy ideas that become meaningful when combined.

Consider each idea as a piece of a puzzle. No matter how insignificant it could look at first, it may be a piece of a bigger picture later on.

# Ideation Principle 2

## Principle

### Rule #2 Capture everything.

#### WHAT DO YOU MEAN?

In the heat of the action, brilliant ideas might get lost ("it's such a good idea, tomorrow we'll remember it for sure" - you won't). There's only one way to solve this: capture every idea on a Post-It Note.

Too many ideation sessions happen during regular team meetings, without the participants being fully aware that they're ideating. Ideas are spoken and jotted down in the meeting minutes. Instead, a key element of the best ideation sessions is that each idea is tracked for use as a building block in following sessions.

#### A few extra tips:

1) One post-it, one idea.

Simple. Don't try to fit an entire business model on a 7x7 cm piece of paper.

2) Use markers, not pens.

This will help you find the most concise way to describe your idea - your teammates will love you for it.

3) Be visual.

If possible, instead of using verbal language, draw a sketch of your idea.



# Ideation Principle 3

Principle



<https://www.boardofinnovation.com/>

## Rule #3 Go for hybrid brainstorming.

### WHAT DOES THAT MEAN?

Group brainstorming is always better than individual brainstorming, right? Well, not really. Research shows that combining individual brainstorming with group exercises leads to more ideas and better ideas.

### Best solution? Hybrid Brainstorming

Do individual ideation first, then group ideation. Starting an ideation session with group brainstorming will make the loudest voices in the room set a determined direction (thus narrowing the breadth of ideas), and frustrate the most creative minds in the room. Instead, begin with an individual component. Once everyone has set their own approach to solving the problem, move to the group session. Leave enough time to discuss and build upon each other's ideas.

# Ideation Principle 4

Principle

## Rule #4 Quantity over quality.

### WHAT IT MEANS

The old adage 'quality over quantity' doesn't hold during ideation exercises. Nothing stops the creative juices flowing quite like critically thinking about the quality or feasibility of your ideas. Being selective is important, but it shouldn't be done during creative exercises. Go for quantity and worry about the quality later.

Need help? Check out our free [brainstorm cards](#) - a collection of 52 cards to help you come up with new ideas.



# Inspiration

# Exploring The Design Space

general overview

A design space constrains a design in some dimensions while allowing exploration of **Alternatives**

## Avoid design fixation

Brainstorming and sketching ideas are good ways of expanding the design space



# The Problem Space

design process

## Think about

- How will your ideas support or extend the way people do things
- For existing designs identify usability and user experience goals



VS



While observing the design space recognize constraints but be open-minded and seek common ground

# Generate Alternatives

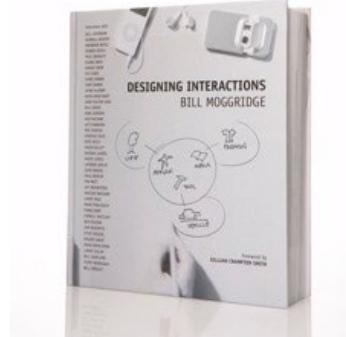
design process

*“considering alternative solutions is a crucial step in the process of design”*

(Preece et al., 2015, p. 336)

where do alternatives come from?

- seeking different perspectives
  - discussing ideas with others
  - Include people from other disciplines
- looking at other designs
  - draw on previous solutions



# Looking at other designs

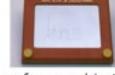
design process

BUXTON COLLECTION

home | explore | about | acknowledgements | contact

## Explore

Browse devices by type (html)

 chord keyboard	 e-reader	 game controller	 gloves and rings	 handheld
 joystick	 keyboard	 mouse	 pedal	 pen computer
 phone	 reference object	 stylus	 tablet	 touch pad
 touch screen	 trackball	 watch	 miscellaneous	

<http://research.microsoft.com/en-us/um/people/bibuxton/buxtoncollection/>

# Looking at new technologies

design process



# Artefacts for Inspiration

IDEO TechBox artifact collection



TechBox at IDEO



# Mood Boards and Personas

design process



**MARK, 22**

**DEMOCRAPHICS**

- Bachelor's degree in upstate Charlotte, NC with child support issues from ex-wife
- Recently got engaged to his long-term girlfriend. They are currently saving to buy a home next year.
- Graduated with a 2.5 in Health Sciences from UNLV. Gross \$25,000 in private loans.

**BEHAVIORAL IDENTIFIERS**

- Hobbies include eating out, imging weightlifting, playing club lacrosse, attending craft beer, tailgating for UNC, NC, and NC State.
- Wants fast shipping. Values a low price. Prefers online marketing, light colors, and simple websites.
- Owns an Android and shops on Amazon. Likes to use social media such as Instagram and Facebook.
- Personality traits: likes to be out of debt by 30, wants to be engaged in 4+ years, and to work in a university sports medicine department.
- Very fit and active but has a bad back. Likes to bring a budget and drink often. Seeks out health information daily.

**JUSTIN, 31**

**DEMOCRAPHICS**

- Bachelor's degree in business administration with his partner. Saving to buy a home next year.
- Recently engaged to his boyfriend of 5 years with plans to marry in NYC in the winter.
- Works at a 4-star resort with a supervisor with a net income of \$100,000.

**BEHAVIORAL IDENTIFIERS**

- Hobbies include vegan cooking, yoga, monthly massages, playing the piano, and traveling. Likes cocktails and watching local plays.
- Wants free shipping on large orders. Prefers to shop online. Extremely brand loyal. Prefers to pay at the register.
- Shops online between 3pm-5pm. Buys during pay periods at the end of the month and often uses promo codes.
- Crosses off chores and tasks. Shops on this tablet with referrals from friends. Likes networking and promotions.
- Personal goals: to become a general manager within 4 years and to purchase a suburban home after the wedding and honeymoon.

**MAGGIE, 52**

**DEMOCRAPHICS**

- Owns a 4-bedroom home in coastal NC and 2 high-end cars. Lives in a suburban neighborhood.
- Has been married for 12 years with 2 sons and a house hold income of above \$200,000.

**BEHAVIORAL IDENTIFIERS**

- Hobbies include reading, playing tennis, networking, and shopping at the country club, but also involved in group fitness and running.
- Wants a simple product. Values quantity and brand image. Prefers print marketing and bold graphics.
- Shops in department stores after 5pm. Buys in bulk or sale items. Believes in value over quality.
- Personality traits: prefers to leave at 5pm. Prefers to purchase items at a desktop. Likes computer. Needs a simple checklist.
- Personal goals: to retire by age 65, to own a vacation home on the Spanish Islands and for her sons to attend an Ivy League university.

Strong need for customer service and support. Values face-to-face communication and rewards programs.

Can help identify alternatives

# Envisioning and Representing

general overview

## Envisioning Design



## Choosing Suitable Representations



## Text vs Sketches



# Sketching

But before we talk about sketching. Sidebar question:

**Aesthetics = Beauty ?**

# Aesthetics = beauty?

aesthetics



*Guernica, 1937 by Pablo Picasso*

# Aesthetics = beauty?

aesthetics



PHOTO COURTESY PAM LONGOBARDI

## Garbage art

Australian aborigines collecting trash that gets washed up from the sea and create art installations

# Aesthetics value

aesthetics



# Aesthetics value

aesthetics

abstract expressionism



Mark Rothko  
Yellow blue

\$43 Million



Mark Rothko  
Orange red yellow

\$86.9 Million

# Aesthetics value

aesthetics

Can you guess the value of those paintings ?

No idea about the one left  
but

But the one in the right:

**\$0**

**The importance of context**



# Aesthetics value

aesthetics

Original picture



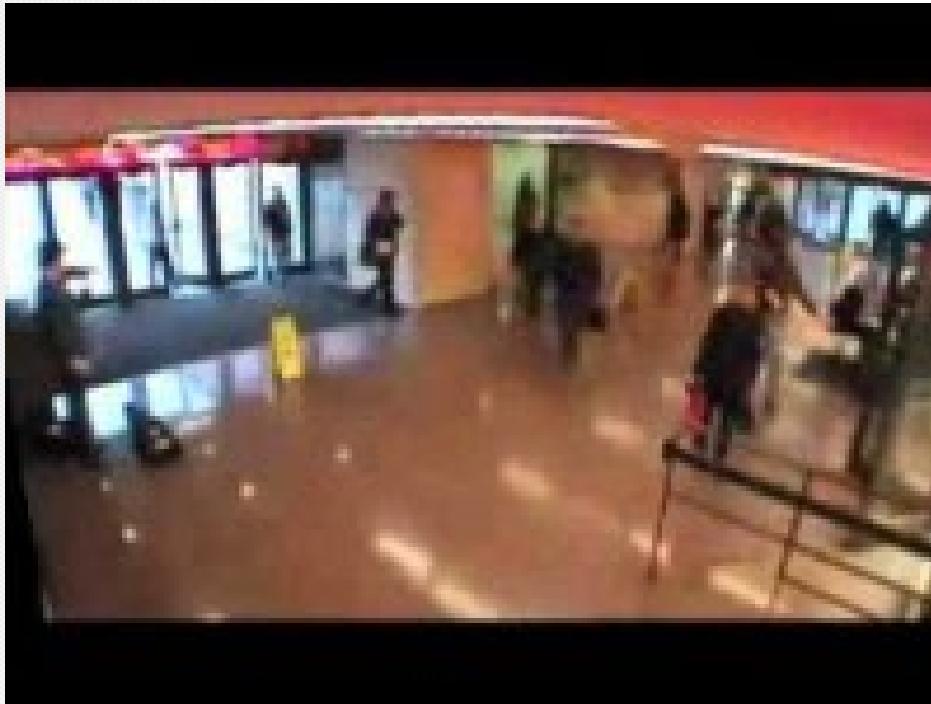
Next to my desk



# Aesthetics value context

aesthetics

Famous violinist Joshua Bell



Played violin for 45 minutes at the metro station in Washington DC

- only 6 people stopped and listen for a while.
- 20 gave him money but continued to walk their normal pace.
- He collected \$32.

His violin costs 3.5\$ million - on average seats for his concerts were 100\$ worth

## Do ideation sketches have to be beautiful?

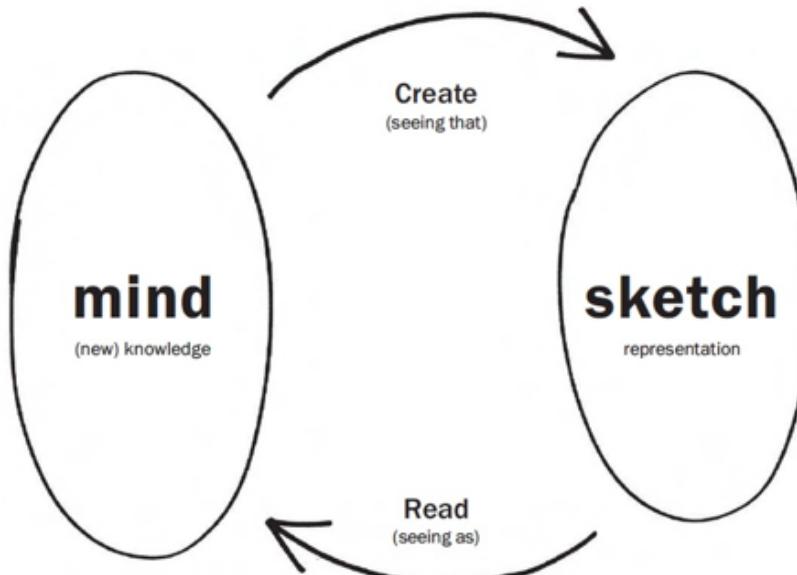
No, sketching is a design activity:  
a tool that helps us think and to talk about design

# Making Sketches

why

“Sketching is about the activity, not the result”

Bill Buxton



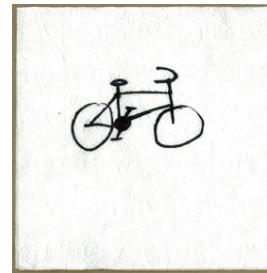
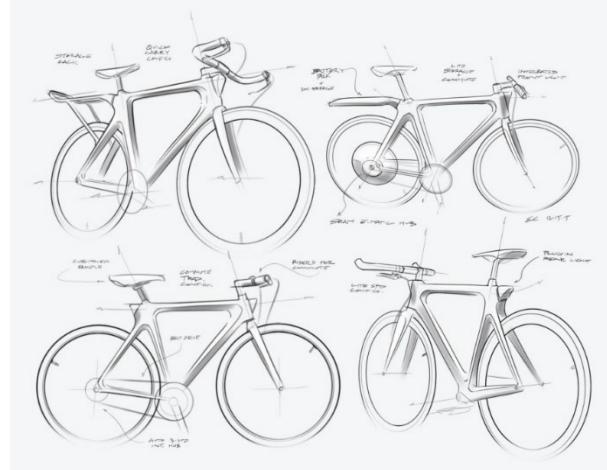
# Finding Suitable Representations

Buxton, Sketching User Experiences (2007)

Different representations of design ideas are useful at different stages for different people

They help with generation, communication and evaluation of ideas

A sketch on a napkin might be useful for generating an idea and expressing it to a colleague (but it is not so good for giving to a client)

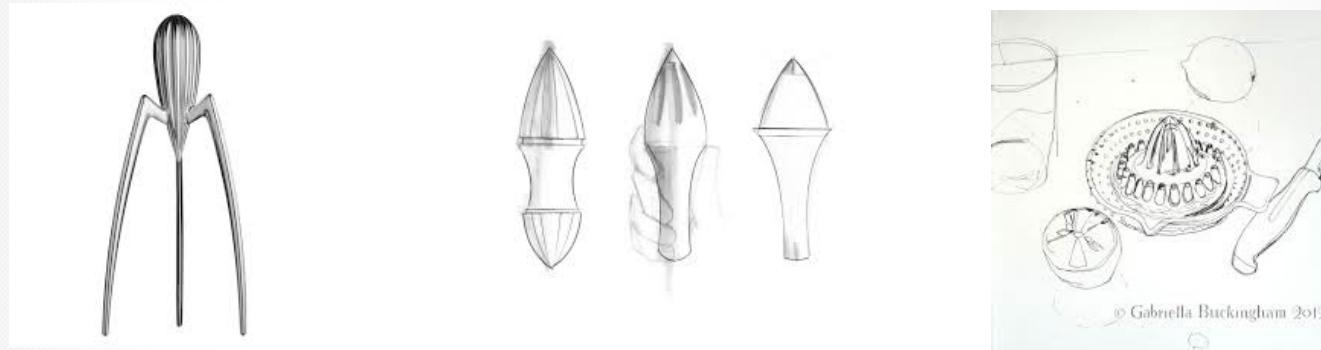


# Sketching Ideas

When and why

early stages of development

support exploration of alternative ideas

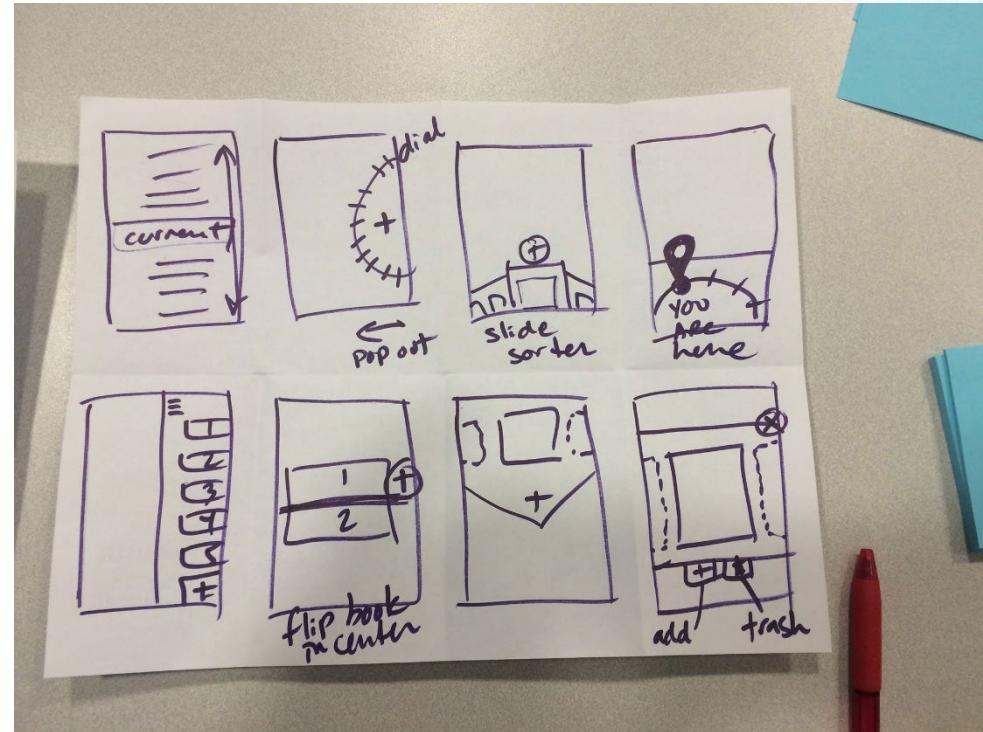


© Gabriella Buckingham 2012

# Qualities of a Sketch

why

- Quick
- Timely
- Inexpensive
- Disposable
- Plentiful



# Qualities of a Sketch

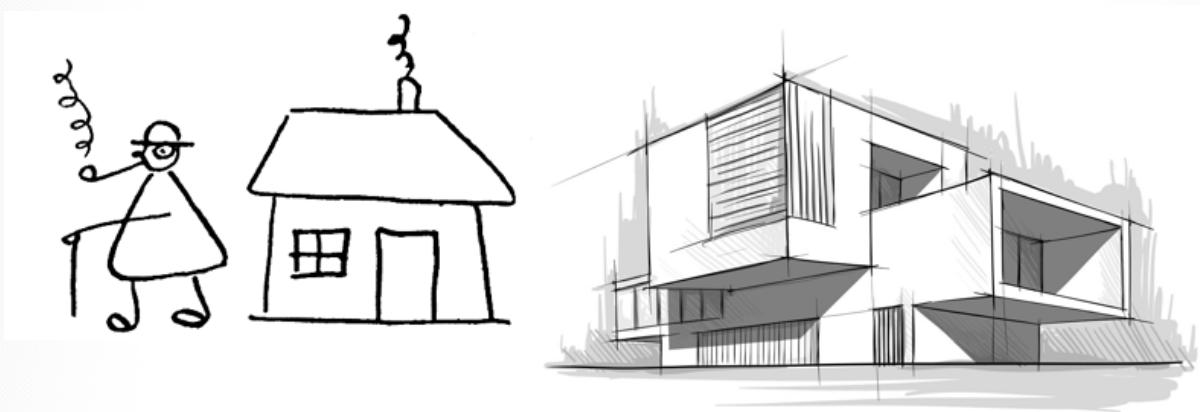
why

- Clear vocabulary
- Minimal Detail
- Appropriate Degree of Refinement
- Ambiguity
- Suggest & explore rather than confirm

# Sketch as Conversation

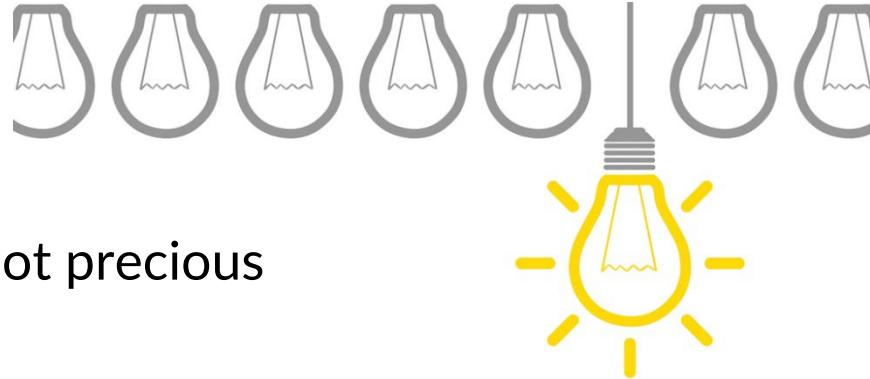
why

A sketch contributes far more to an activity or process (the design conversation), rather than a physical object or artefact



# Sketching

Sketching as a design process



- Ideas are not precious
- Design is a negative activity
- Sketches are proposals not solutions
- It is about exploring alternatives not refining UI

## Challenge 2

## Challenge 2

instructions

On a piece of paper, using your pen or pencil, draw a 10 second representation of the following:

- a dog
- a desktop computer
- social media

How did you choose what to highlight?  
What features did you leave out?



# Challenge 3

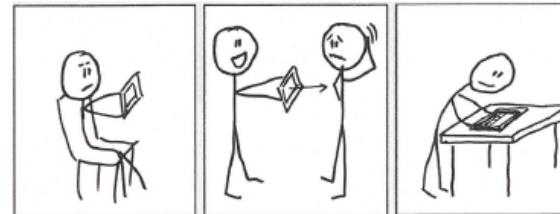
## Challenge 3

instructions

Sketching can also be used to show different contexts or situations of use

draw a person interacting with a tablet computer  
in three different situations

did you vary their facial  
expressions depending on the  
situation?

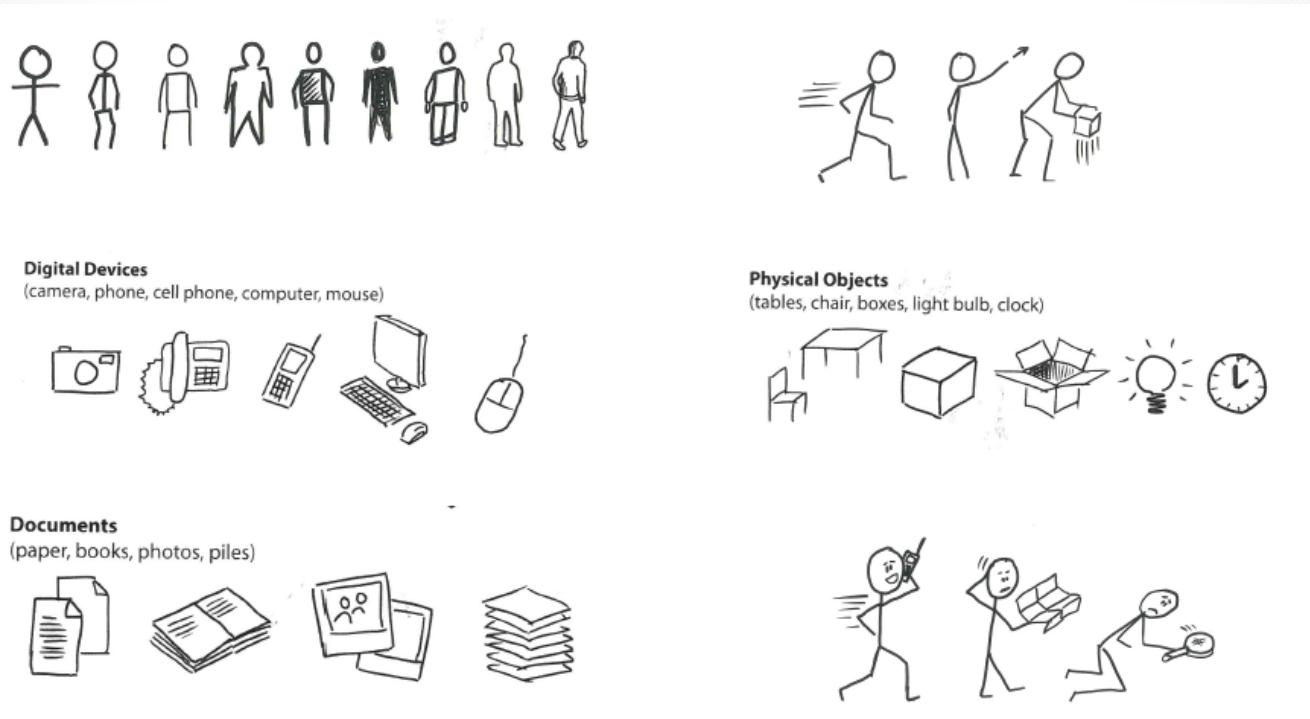


# Sketching

vocabulary

## hand-drawn sketches - “sketching vocabulary”

(Greenberg et al., 2012, Sketching User Experiences, p. 85)



# Text vs Sketches during ideation

Diary studies

**Both are valid. Use a combination**

Sketches may give a faster overview of an idea

**But** they are not always possible

- Aesthetics do not matter. If the concept is communicated well.
- Simplicity is important
- Do not spent time trying to make it beautiful. It may may be more difficult to discard the idea afterwards

Text may be better for abstract ideas

**But** more difficult to get an overview of multiple ideas

- keep it sort
- Use markers
- One idea per note/post-it

## Part 3

### 3

## Ideation Methods

- Idea creation
- Sorting of ideas?

# Ideation methods?

Method overview

## creating

- Brainstorm
- Brainwriting
- HMW questions
- Six thinking hats
- Attribute listing
- 5 Ws+H
- Five Whys
- 3-6-5 Method
- 10 plus 10
- Crazy 8
- Creative Matrix
- Idea card
- Use of analogies

## reducing

*Sorting ideas*

- Octopus clustering
- Benny Hill sorting

*Ranging ideas*

- Idea portfolio'
- Desicion matrix

*Voting ideas*

- Raise hands
- Dot voting
- Barometer
- Four categories method

# Idea creation techniques

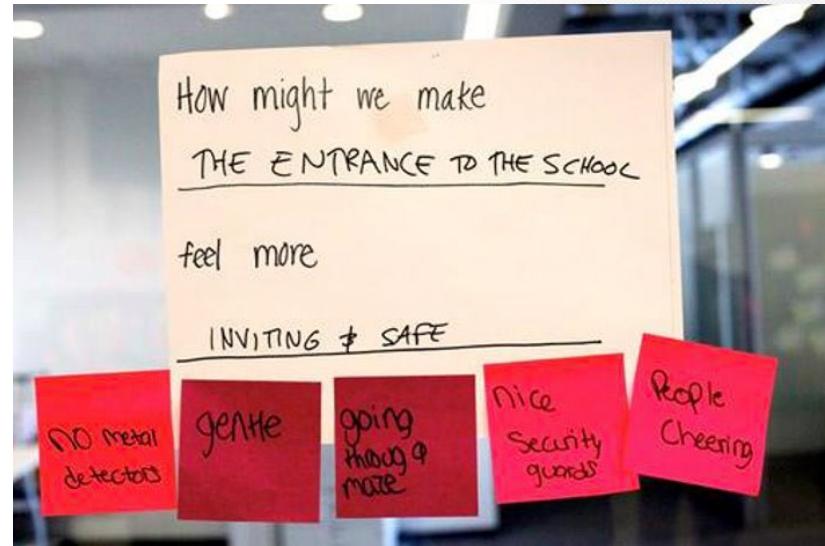
# How Might We (HMW) questions

Creation methods

Developing trigger questions from insights and user stories is a good way to convert research into a wide range of actionable ideas.

Based on problem statement/design problem. Can also be created from insights and user stories

By placing “how might we...” at the beginning of each question, we are able to provide a framework for brainstorming solutions



# How Might We (HMW) questions

Creation methods

## example

### KEY INSIGHTS



Alan

persona, character, role

wants to eat less chocolate

action, situation

because it makes him fat

aim, need, outcome

but it makes him feel safe.

restriction, obstacle, friction

How might we help Alan eat less chocolate?

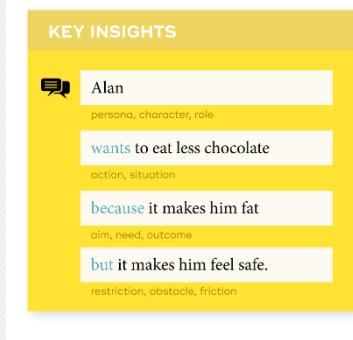
How might we help Alan lose weight?

How might we help Alan feel safe?

# How Might We (HMW) questions

Creation methods

## example



## elaborate

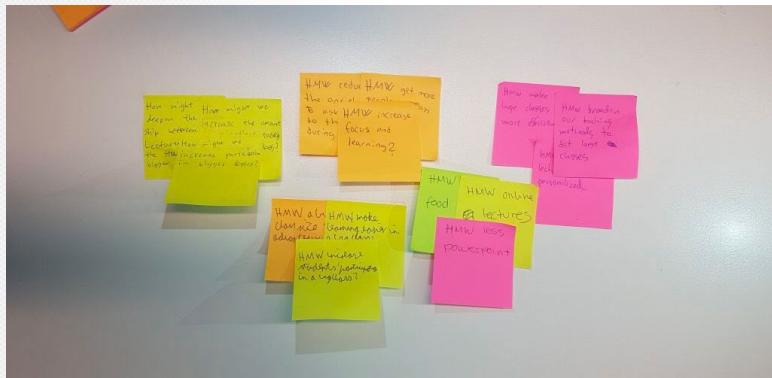
How might we help Alan feel happy at his current weight?  
How might we help Alan stay healthy?  
How might we help Alan look great?  
How might we help Alan know when he is really hungry,  
and when he is comfort eating?

## Prioritise and select

## Ideate

# How Might We (HMW) questions

## Creation methods



- Cluster and prioritize
  - Start with your prioritized clusters and the trigger questions inside them.
  - Take an individual question and try to generate as many answers as possible for that question. (Use brainwriting, or whatever method fits the question best)
  - Repeat until you have enough ideas or the quantity becomes unmanageable

Move into idea selection when you are ready

# Brainstorming

Creation methods

**Brainstorming** – You build good ideas from each other's wild ideas.

**Braindumping** – This is like brainstorming, but done individually.

**Brainwriting** – This is like brainstorming, but everyone writes down and passes ideas for others to add to before discussing these.

**Brainwalking** – This is like brainwriting, but members walk about the room, adding to others' ideas.



# Brainstorming

Creation methods

Show the theme or key question on a poster or projector.

Participants call out ideas which are written down on a board by a facilitator. This generates a pile of ideas quickly.

- Ask the group to shout out their ideas or answers. Write their words legibly on the board.
- When all ideas are on display you can group them under whatever criteria the group prefer, discuss them, and/or begin a selection technique.

**Expected result:** Idea descriptions (text), idea sketches (visualizations), map of idea groupings



# Brainstorming

Creation methods

## Tips:

1. Begin with a target problem/brief
2. Set a time limit (15-60min)
3. Write down everything
4. No judgment/criticism
5. Aim for quantity
6. Build on others' ideas
7. Stay visual
8. Allow one conversation at a time

# Brainwriting

Creation methods

Individual participants work in parallel and in silence, writing their own ideas on pieces of paper which are put to one side or passed on to the next writer.

This method produces more ideas than brainstorming, but develops less synergy as it is more quiet and thoughtful.

Use it when ideas are more complex, when brainstorming is not practical.

When all ideas are on display you can group them under whatever criteria the group prefer, discuss them, and/or begin a selection technique

## When should you use brainwriting?

- ✓ When you're under time pressure
- ✓ When there are quiet, introverted people in the group
- ✓ When your group is too large to brainstorm effectively
- ✓ When you don't have a moderator

**Expected result:** Idea descriptions (text), idea sketches (visualizations)

# Crazy 8 – fast sketching exercise

Creation methods

Crazy 8's is a core Design Sprint method.

It is a fast sketching exercise that challenges people to sketch eight distinct ideas in eight minutes.

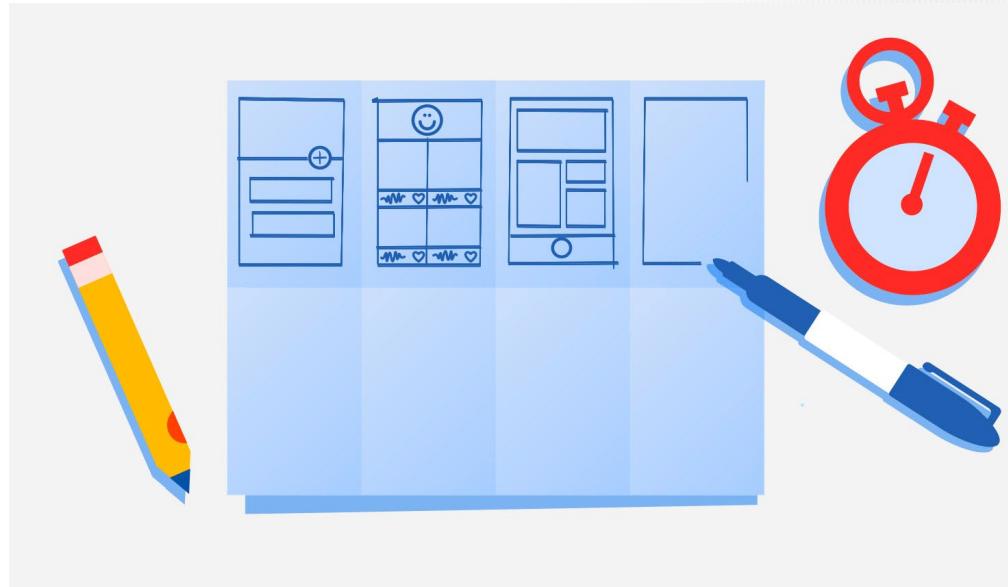
The goal is to push beyond your first idea, frequently the least innovative, and to generate a wide variety of solutions to your challenge.



# Crazy 8 – fast sketching exercise

Creation methods

1. Take a piece of paper and fold in 8 sections
2. Set a timer to 8 minutes
3. Each group member draws one idea per section
4. When alarm go off - put away pencil





©marketoonist.com

## Idea selection techniques

- Sorting ideas
- Ranging ideas
- Voting ideas

# Sorting ideas - Octopus clustering

## Sorting ideas

One of the fastest ways to sort a lot of ideas, insights,

- Works very well on large amounts of ideas and involves many people
- Provides a good overview of the material
- Contributes to increased ownership of the ideas between group members



# Sorting ideas - Octopus clustering

Sorting ideas



Cover the wall with post-its

3-5 rows of people in front of the wall

The roles change and depend on which row you are in

Row 1 is active in moving and grouping

Row 2 is active in guiding the first row – be loud and helpful

Row 3 has the overview and look for missing post-its, call out suggestions for row 1. Create categories.

Rows 4-5 should discuss with the neighbour, look for the overview and get ready to give advice or create categories.

# Sorting ideas - Octopus clustering

Sorting ideas



Every 30 seconds: “Empty your hands! Come out! Move forward! ”

Finished after 5-8 cycles

**Preparation:** hang up post-its

**Time:** 5-15

**Output:** Sorted groupings of post-its,  
knowledge of the content of the notes and an  
increased ownership of the ideas

# Ranging ideas - Idea portfolio

Ranging ideas

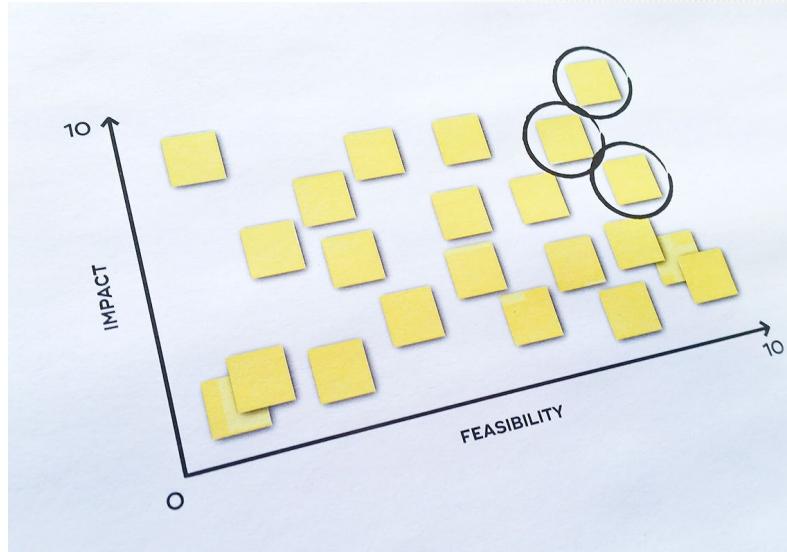
Ranking according to two variables arranged in a portfolio or in a graph

Makes it possible to balance different needs

Great way to prepare the ground for an informed choice

Facilitates a strategic view of the alternatives

The discussions in this method are often as important as the ranking



# Ranging ideas - Idea portfolio

## Ranging ideas



Invite the right people next to your core team

Determine criteria, for example: impact on customer experience vs feasibility

## Draw the graph

Take one idea at a time

Range according to the two criteria, 0-10 points per variable

Choose which ideas you want to continue exploring; it does not have to be just those who have a high degree of implementation

# Ranging ideas - Idea portfolio

Ranging ideas



**Preparation:** Creating axes

**Time:** 10-40 min

Low-intensity, thoughtful

**Output:** Visual arrangement of ideas, ranked along two axes

# Voting - Dot voting

Voting ideas

Participants are given sticky dots or markers to mark their choices

Hang up the ideas and participants move around and mark the ideas they think deserve votes

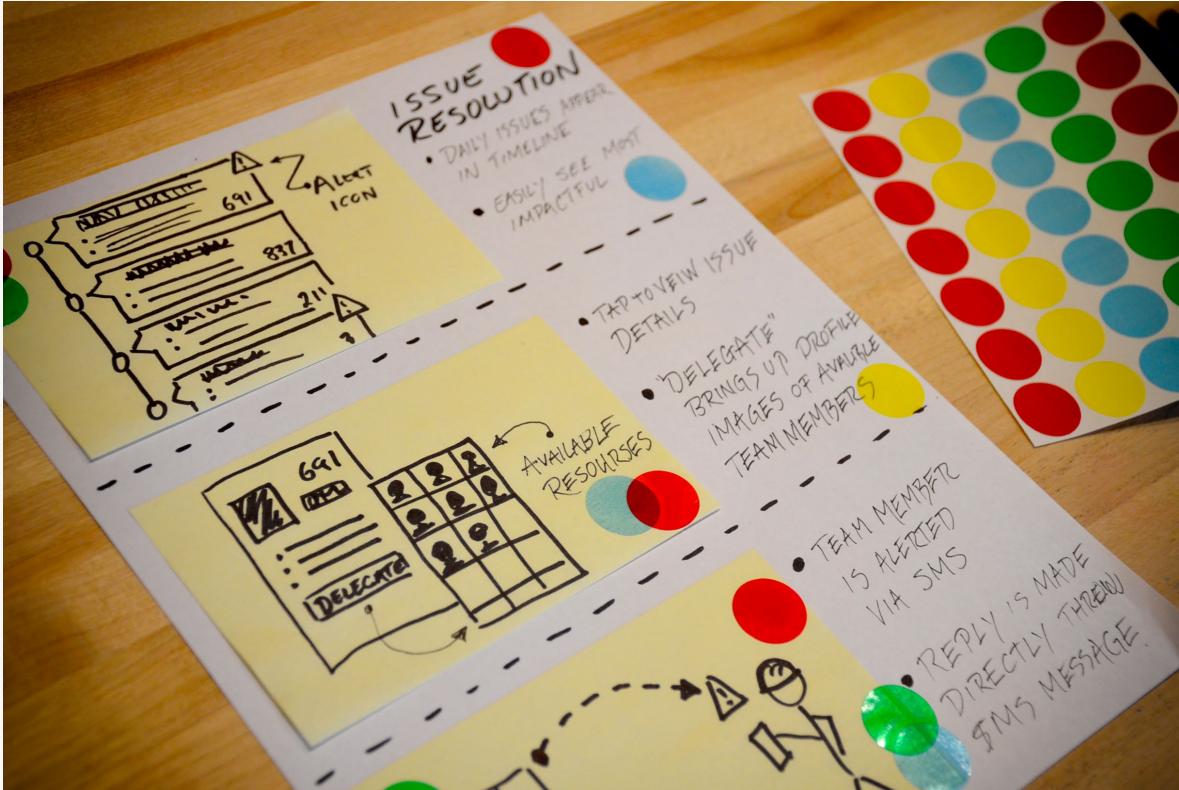
It is common to give a set number of votes to each participant

Easy to see who got the most votes



# Voting - Dot voting

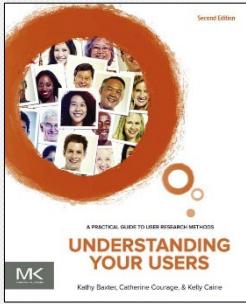
Voting ideas



# Reading material for this Lecture

exercise

## Reading



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)

- Use as many techniques as you have time for to progress in your design process
- Generate as many ideas as possible using HMW questions, brainstorming, crazy 8
- Sort, Rank, and Vote for your ideas using Octopus clustering, idea portfolio, dot voting



**Don't forget to take pictures of your ideation process**

# Thank you

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