Ideation

Generating Ideas as a Group!

- Generate ideas individually first
- Then come together as a group and brainstorm
- Write down everything on a board

After you collect information about the users and their goals, you'll have to identify a key **problem** that you're going to solve by building new software. Sometimes the problem will jump out at you; if so great. If not, you'll need to generate some ideas for problems to solve. That means reading and thinking about all the information you've collected and then doing some idea generation. These slides talk about the **idea generation** process. You'll find this useful not just at this stage, but also for the next step in your project when you'll have to generate ideas for solutions to the problem you've identified.

Note that **group brainstorming by itself is not the best approach**. It's been shown that you'll generate more ideas if you and your teammates first think about it privately, write down your individual ideas, then come together as a group to synthesize and build on each other's ideas. At top design firms like IDEO, if you don't bring in at least 5 ideas to every ideation meeting, then you won't last long as a designer.

IDEO's Rules for Brainstorming

- Be visual
- Defer judgment
- Encourage wild ideas
- Build on the ideas of others
- Go for quantity
- One conversation at a time
- Stay focused on the topic

IDEO has developed a list of rules for good brainstorming as a group. Read more about them here.

Point-of-view (POV) / Problem Statement

- Reframing a design challenge into an actionable problem statement
- Data collection and interpretation lead to:
  - We met . . . [user]
  - We were amazed to discover . . . [what you noticed]
  - We wonder if this means . . . [insight]
  - We aim to (help our user) . . . [need/goal]
- POV: [**USER**] **needs to** [USER'S NEED] **because/but/surprisingly** [INSIGHT]
  - USER'S NEED must be expressed using "Verb"
- Example
  - Poor POV: "A teenage girl needs more nutritious food because vitamins are vital to good health"
  - Good POV: "A teenage girl with a bleak outlook needs to feel more socially accepted when eating healthy food, because in her neighborhood a social risk is more dangerous than a health risk"

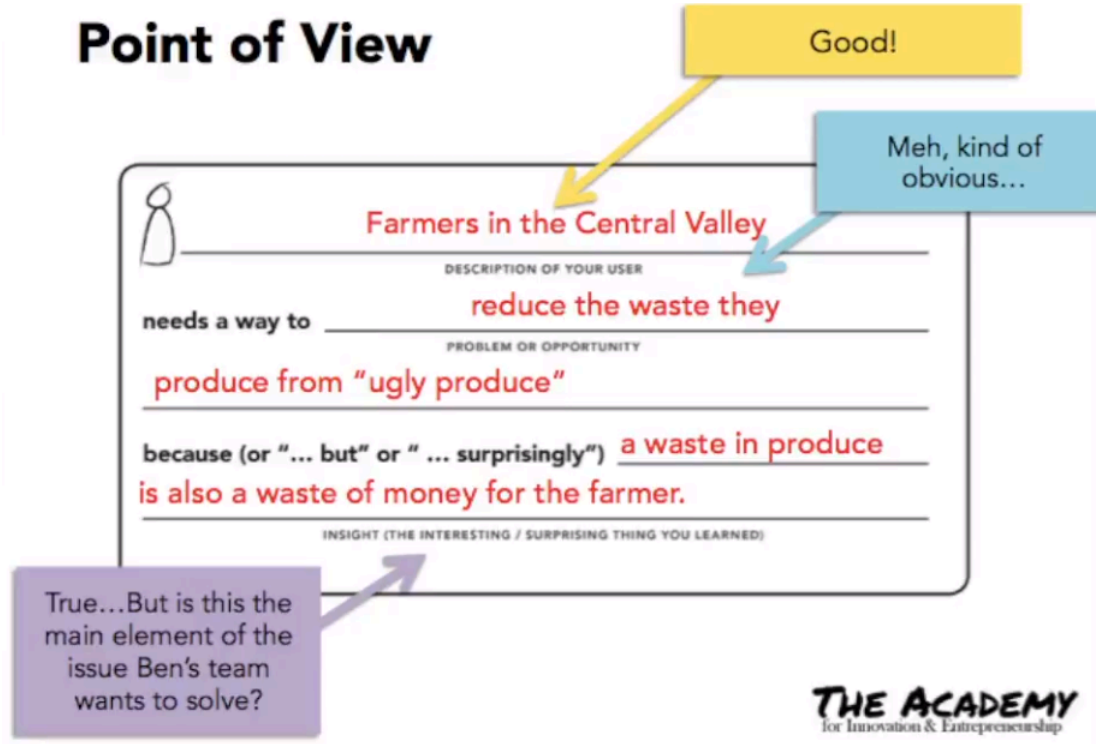
This slide is based on the POV article from Stanford's d-School

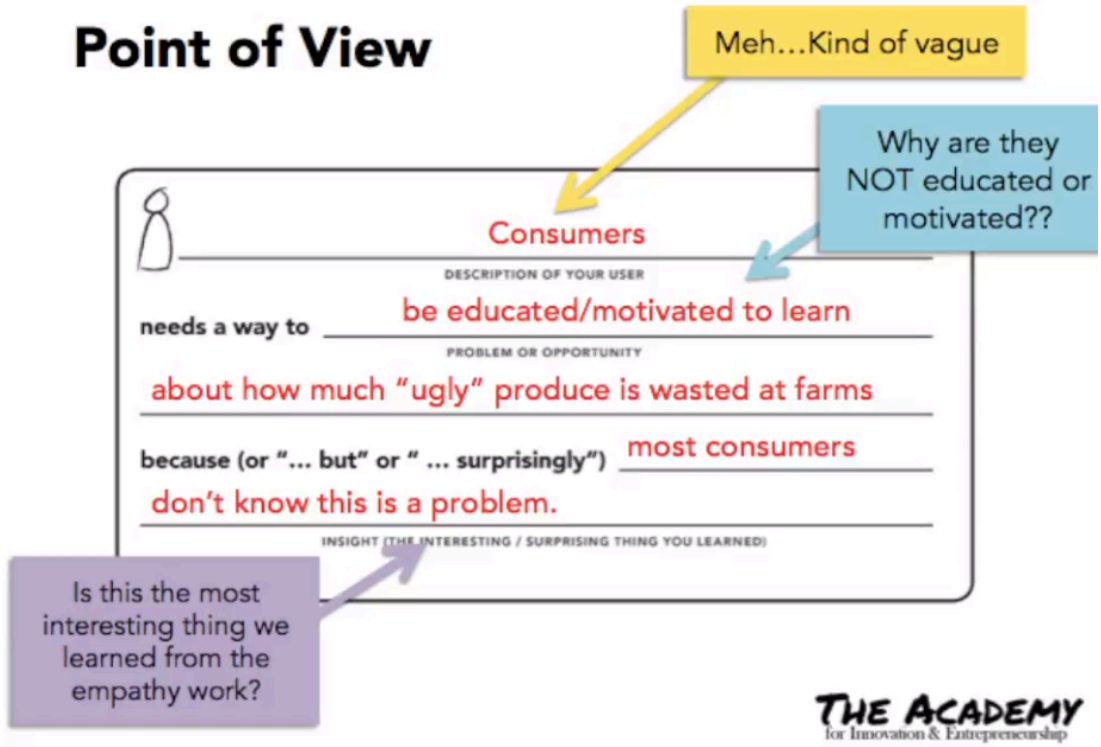
Before you start brainstorming, you need to first define a POV or problem statement. POV helps you to focus on user segments and their needs. Also, it helps you to think about why "the users need to do something" (what we call "insights"). After the data collection and interpretation, you have user needs and persona (representing user segments), which provide a basis for creating your POV.

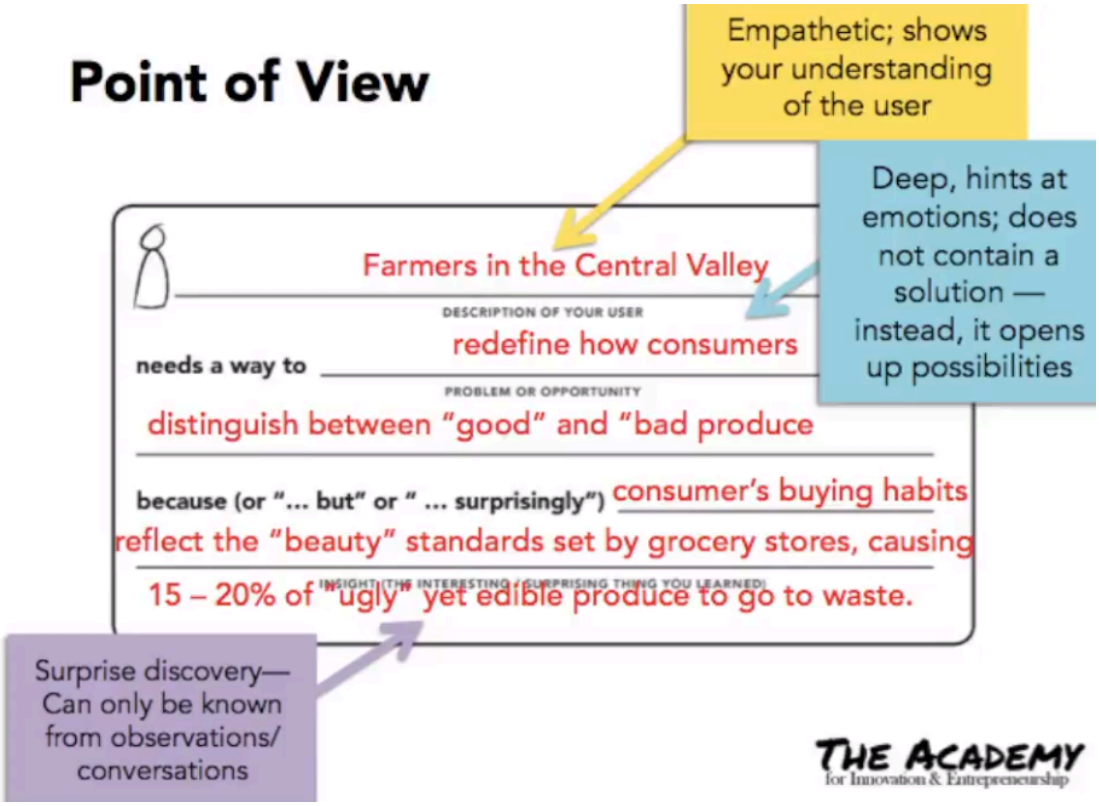
D-School's article explains that a good POV example is an actionable, and potentially generative, problem statement, while a poor POV example is little more than a statement of fact, which spurs little excitement or direction to develop solutions."

Here are a few example POVs: "An overworked husband needs to feel good about recycling. When things pile up he feels behind. And ultimately the big pile on the curb feels more like generating waste than doing good." A social networking example is given as "High-energy teenager seeks awesome social network, because the willingness to IM constantly during the school year is a MUST!"

POV Examples







These screenshots are from [Revising your POV: "Imperfect" Example](#) by Academy for Innovation & Entrepreneurship

I found a great example from YouTube. Please take a look at [this video](#) that talks about POV statements of *imperfectproduce.com*, a recent startup that sells "ugly" shaped produce for reducing waste. I got the screenshots from the video. You can see that the first two examples are less appealing, but the last one is a very strong POV that tells the value of the service. Of course, it does not tell exactly what the service looks like. In fact, POV is just a problem statement (not a solution statement), and a strong POV helps you to generate many ideas/concepts.

Brainstorming with How Might We (HMW) questions

- Begin with the POV or problem statement
- Break the larger challenge up into smaller actionable pieces
- Generate How Might We (HMW) questions to meet the needs (you can use the templates below)

Challenge: Redesign the ground experience at the local international airport
POV: Harried mother of three, rushing through the airport only to wait hours at the gate, needs to entertain her playful children, ***because*** "annoying little brats" only irritate already frustrated fellow passengers.

- **Amp up the good**: HMW use the kids' energy to entertain fellow passengers?
- **Remove the bad**: HMW separate the kids from fellow passengers?
- **Explore the opposite**: HMW make the wait the most exciting part of the trip?
- **Question an assumption**: HMW entirely remove the wait time at the airport?
- **Go after adjectives**: HMW make the rush refreshing instead of harrying?
- **ID unexpected resources**: HMW leverage free time of fellow passengers to share the load?
- **Create an analogy from need or context:** HMW make the airport like a spa? Like a playground?
- **Play POV against the challenge**: HMW make the airport a place that kids want to go?
- **Change the status quo**: HMW make playful, loud kids less annoying?
- **Break POV into pieces**: HMW entertain kids? HMW slow a mom down? HMW mollify delayed passengers?

This slide is based on the HMW article from Stanford's d-School

HMW questions will greatly help you to generate ideas. You can follow the examples above. Please note that during the HMW phase, you're not generating solution ideas yet; don't jump into the solutions too early.

You can also find other examples of POV and HMW questions from the CS374 team projects in 2022 Spring:

Example 1)

- POV
  - People who prepare meals for themselves or the people around them **NEED TO** Remember when they bought, and until when they can eat the foods which they have bought **BECAUSE** the back of the freezer can become a black hole in the user's mental model where food items get lost until long past their expiration date
- HMW questions
  - HMW provide interaction chances with ingredients long lasting in the fridge?
  - HMW relate freezer arrangement into a game playing activity?

    - HMW focus on the emotional aspect of filling up the ‘black hole’ of users’ mental model?
    - HMW don’t use the fridge for storing ingredients?
    - HMW use long-lasting ingredients in the other way, rather than cooking?
    - HMW teach users to remember ingredients’ information for a long time?
    - HMW make the freezer friendly for recently-stored foods?
    - HMW make long-lasting ingredients more useful?
    - HMW entirely remove long-lasting ingredients from the freezer, and store them in the other place?
    - HMW make users want to open freezers more frequently?

Example 2)

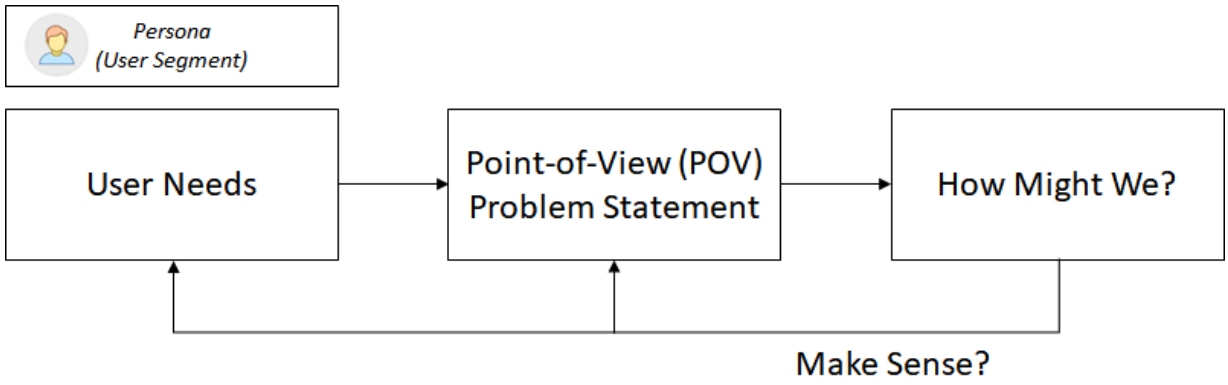
- POV
    - Dog owners **NEED TO** relieve their concerns that they might miss the signs of their pets' health problems **BECAUSE** if they do, they may end up treating dogs with surgery or drugs, and when a dog undergoes such medication, the risk is much greater than when a person does
- HMW questions
    - HMW make the signs of a dog's health issues undeniably obvious?
    - HMW convert a dog owner's concerns into positive energies?
    - HMW do some preemptive tests rather than just waiting for any sign to come up?
    - HMW make a dog owner's dog report his own problems by himself?
    - HMW enable the treatment of vet at a dog owner's home?
    - HMW keep noticing a dog owner to check his/her dog?
    - HMW enable people to share their own methods to observe their dogs?
    - HMW let the signs of dog's health issues automatically recorded?
    - HMW inform a dog owner how dogs behave in certain situations?
    - HMW make the task of detecting symptoms of a dog fun?
    - HMW inform a dog owner what to detect?
    - HMW let a dog owner collaborate with colleagues to watch his/her dogs?

Example 3)

- POV
    - Single-person households **NEED TO** be with close friends without much effort or cost **BECAUSE** they feel lonely alone but surprisingly, they don’t meet their friends unless there’s something special
- HMW questions
    - HMW reduce the cost for hanging out with their friends?
    - HMW make his close friends to live together with?

- HMW make their friends come to see him?
- HMW make something special so that he can visit his friends?
- HMW make people meet their friends without anything special?
- HMW reduce loneliness even if he is alone?
- HMW reduce his work so that he has more time to go visit his friends?
- HMW make him always be with his friends so that he feels less lonely?
- HMW reduce the time they are alone?
- HMW make him friends with people who live near him?

POV & HMW Process



From the user's needs we define a problem statement or POV, and then start generating ideas with “HMW” as illustrated before. The above diagram is a simplification of the process (User Need to Design Challenge by Aurobinda Pradhan). As you generate new ideas, you can check whether it makes sense or not. You can always go back to POV and generate additional HMW questions. If your POV needs modification, you can also go back to user needs and revise your POV.

10+10 Method

- HMW provides a useful tool for generating ideas
- Generating 10 ideas/concepts + 10 variations of concepts
- Phase #1: Idea generation + reduction
  - Generate 10 ideas/concepts (HMWs)
  - Reduce the ideas/concepts
    - Review all ideas, discard ideas without merits, get feedback after

sketching
- Phase #2: Design variations of the chosen idea/concept
    - Produce 10 details (variations of the idea/concept), by exploring different ways of realizing the idea/concept

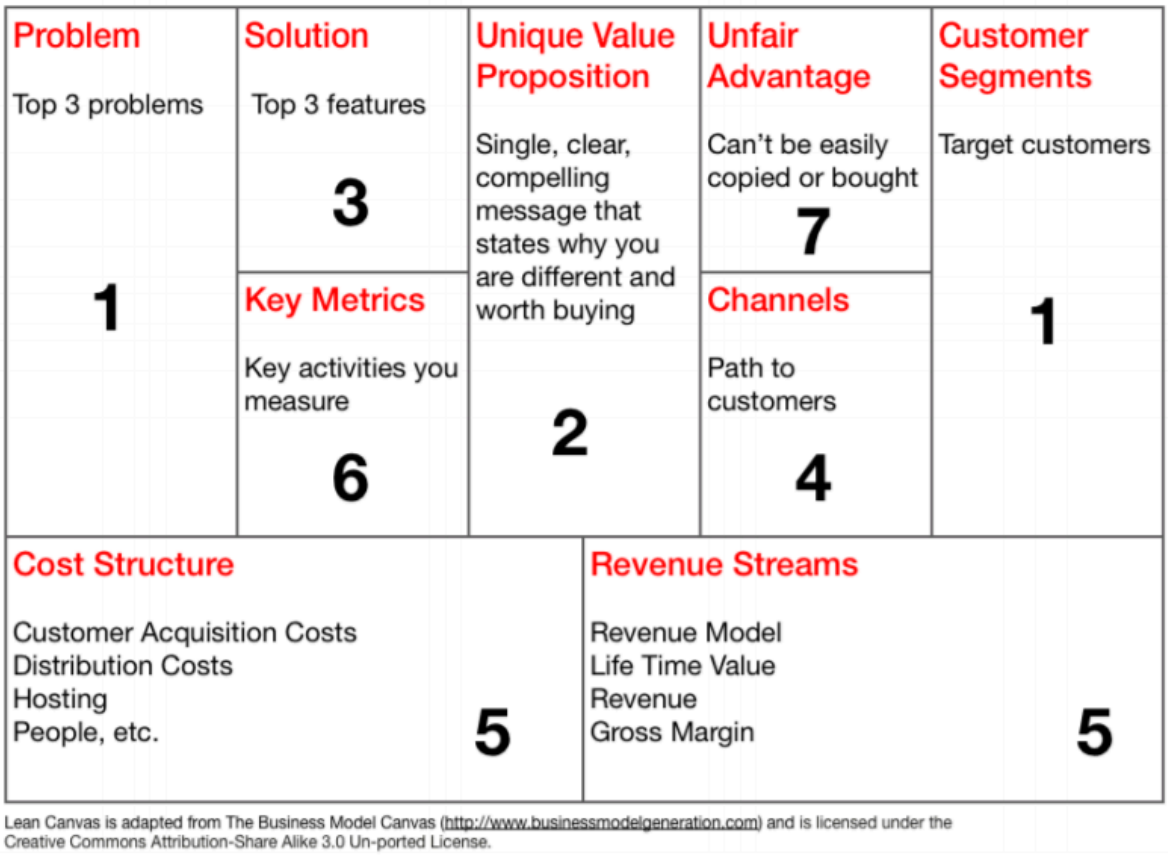
HMW helps you to brainstorm or generate new ideas to address the POV. For successful ideation, we may want to follow the 10+10 method proposed by Saul Greenberg (in his book, “Sketching User Experiences: The Workbook”).

The key idea of the 10+10 method is to generate as many ideas as possible in the first phase and yet we defer our judgment for reduction. For idea generation, we can use HMW questioning: each HMW question can be considered as an idea/concept. The important thing is that we should not evaluate whether a HMW question makes sense immediately after making it; just keep generating ideas!

I intentionally used the term “concept” right next to the idea. I like the term “concept” because you can treat it like a bowl that can contain multiple design variations (or solutions). This means that your HMW question should be able to generate multiple design variations. Obviously, we prefer design concepts in proper size: neither too big (too abstract) nor too small (too narrow to a specific solution). But if you have a great design concept (but narrow), that’s still fine.

After generation, we then reduce the ideas/concepts by carefully reviewing all the ideas. Obviously, we need to get rid of the ideas that do not have much merit (values to the users, or feasibility). You can always receive feedback from others. After reduction, you can move on to the second phase, or continue generating/reducing ideas. The next phase is coming up with design variations. At this point, you chose the target design concept(s) to work on. You then explore different ways of realizing the idea/concept.

Lean Canvas



https://canvanizer.com/downloads/business_model_canvas_poster.pdf

Business Model Canvas by Alexander Osterwalder helps you judge your "solution ideas" in a more systematic way from a business point of view. During the ideation phase, if you're serious, you can draw a business model canvas to visualize your business model. In our class, we use the lean canvas by Ash Maurya:
https://leanstack.com/LeanCanvas.pdf

We focus on the following aspects:

(1) **Users & Problems**: For a given customer segment, you need to list the key problems (or key jobs that need to be done). You may also want to list what are existing alternatives (e.g., existing technologies).
(2) **Value proposition** tells why you are different and worth getting attention. Here, the value proposition should be directly from the number one problem that you're trying to solve. You need to focus on the customers' benefits after using your product/service (not focus on the features of your products).

(3) **Solution (key activities)**: Simply sketch out the key activities required to fulfill the value proposition. At this point, you only need to suggest a minimal viable product (MVP); please note that adding more features/activities does not necessarily help you make a successful product.

The overall structure is very similar to POV statements, but it is more focused on the value proposition and solutions (key activities). Like POV, the canvas has user segments and their problems/needs. The canvas however is very focused on specific "solutions", whereas POV statements (HMW questions) are related to abstract ideas/concepts. This is quite natural because the goal of the canvas is to visualize the business model in a single page (e.g., what are the key activities, how these deliver value to the customers, what are the channels to approach customers, and what are the cost structures and revenue streams). As shown earlier, we use POV as high-level user stories about users' problems/needs to guide idea generations (via iterative HMW questioning). The canvas helps us to quickly examine the value of the design ideas or design details.

Let's examine the aforementioned POV example: "Farmers in the Central Valley need a way to redefine how consumers distinguish between "good" and "bad" produce because consumers' buying habits reflect the "beauty" standards set by grocery stores, causing "15-20%" of "ugly" yet edible produce to go to waste." This POV does not propose any solution yet. The key observation here is that there is 15-20% of ugly yet edible produce. Here, one HMW question would be "How might we 'sell' such produce so that both farmers and customers can get benefits?" There are many design variations about "how we will sell such produce." At this point, you can evaluate your business models of different variations.

The best way of drafting business models is to analyze existing (successful) services using the canvas. Here is a good example: Uber canvas.

If you would like to know more about the rest of the elements, you may want to read Ash Maurya's article: https://leanstack.com/LeanCanvas.pdf

Storyboarding

- Storyboard captures setting, sequence, and needs satisfaction
- Outline storyboard frames (say 5 blank boxes)
- **Develop the storyline (1)**
- **Sketch establishing shot (introduction) (2)**
- **Continue the storyline sketches with appropriate camera shots (3)**
- **Emphasize actions and motions (4)**
- Demonstrate to others and iterate

Storyline: (a) a person is passing by an announcement board in a public setting; (b) the person then notices one particular announcement and is interested in more information; (c) the person uses a mobile phone to capture the bar code displayed next to the announcement; (d) detailed information appears on the mobile phone display; and (e) the person walks away from the board.

Examples from [The Narrative Storyboard: Telling a story about use and context over time](), Saul Greenberg, Sheelagh Carpendale, Nicolai Marquardt, Bill Buxton, Interactions 2012

The goal of storyboarding is to illustrate a scenario/story that depicts how your product is used in practice. It is a very quick way of capturing, and exploring your idea. A storyboard should include how the supporting setting looks like (e.g., users, tasks, and environments), how a rough sequence of steps takes place (including an illustration of what causes such tasks), and how user needs are satisfied. We're not creating "movie storyboards", but simply "stick figures and simple shapes" to get our main points. We don't need to worry about the quality.

Here are the steps of storyboarding. The first step is to prepare a blank sheet and draw boxes (say five boxes/frames). You can have more than five if you wish, but limiting the number of boxes would be useful. The next step is to come up with a storyline. The following questions can be considered to plan your storyline:

- Where does the interaction take place?
- What is the problem?
- What is the task that people are trying to do?
- Which people are present and what are their actions?
- What kind of objects or digital devices do they use?

- What is the possible input and output for each digital system?
- How do the actions of people and/or devices solve the problem?

You then need to draw the first scene that introduces where the interaction takes place by illustrating the setting and people. After the first scene is set, then you can work on the following scenes as shown above. The final step is to emphasize a user's action/motion via annotation (in yellow above), which otherwise is difficult to illustrate in a still image.

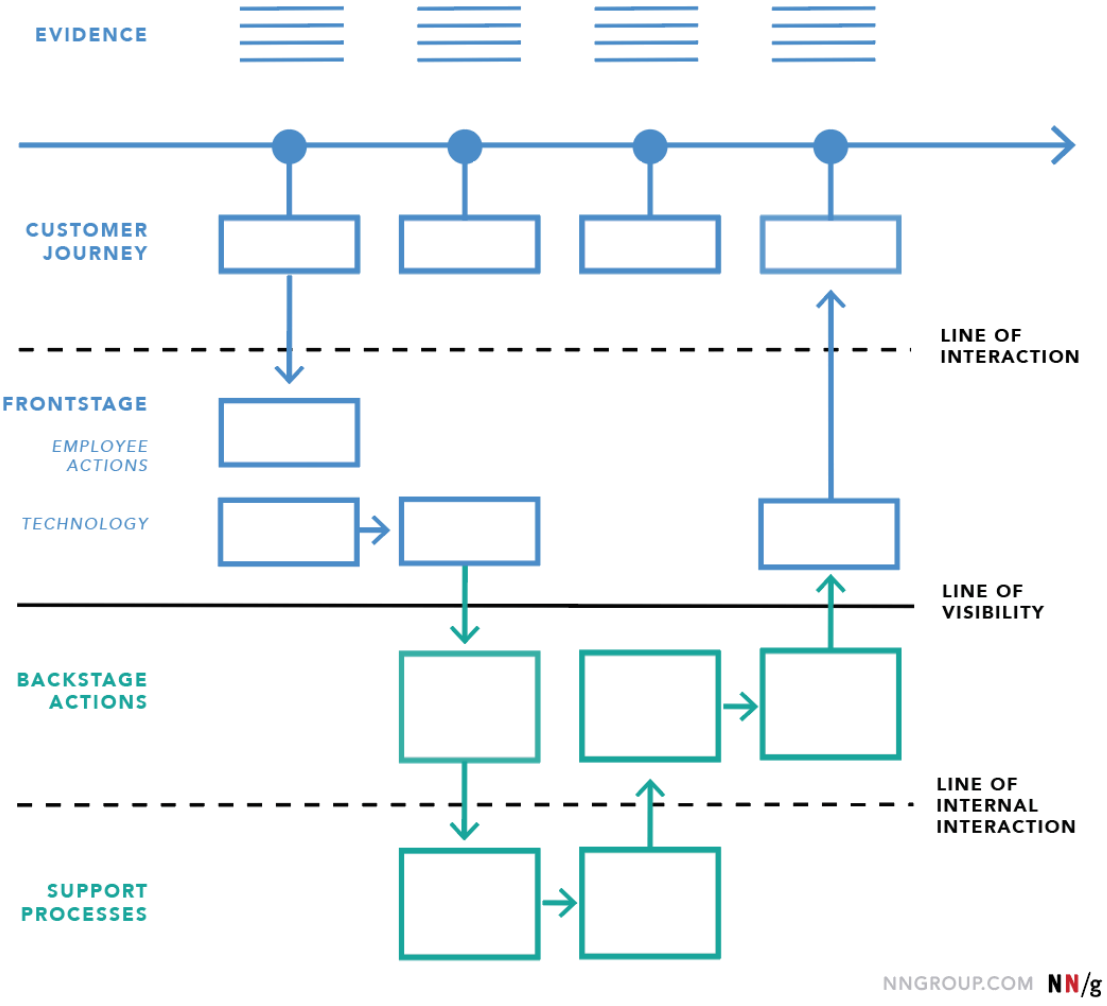
Required reading:

The Narrative Storyboard: Telling a story about use and context over time, Saul Greenberg, Sheelagh Carpendale, Nicolai Marquardt, Bill Buxton, Interactions 2012

Amal Dar Aziz's guide to storyboarding, Stanford CS147, 2009

Service Blueprinting

- A service blueprint is a map of
  - The **user journey** – phase by phase, step by step
  - The **touchpoints** – channel by channel, touchpoint by touchpoint (related to user interactions)
  - The **backstage** processes – stakeholder by stakeholder, action by action
- Service blueprint helps
  - Identify key activities in creating and delivering service
  - Define "big picture" before "drilling down" to obtain a higher level of detail



Service Blueprints: Definition, Sarah Gibbons 2017

Storyboarding helps you to capture the essentials of your idea in a visual way. Service blueprints do not have such visual elements. However, they help you visualize the entire user journey, touchpoints (when users interact with the system), and backstage processes (that are not visible). After you finish storyboarding, you can draw a service blueprint, and this helps you to better understand the overall interactions (as well as the backstage process).

You can learn more about service blueprinting from (1) this sample book chapter (Essentials of Services Marketing by Christopher Lovelock et al.), and (2) Service Blueprints: Definition, Sarah Gibbons, Nielsen Norman Group 2017.

Why Keeping Multiple Alternatives Around?

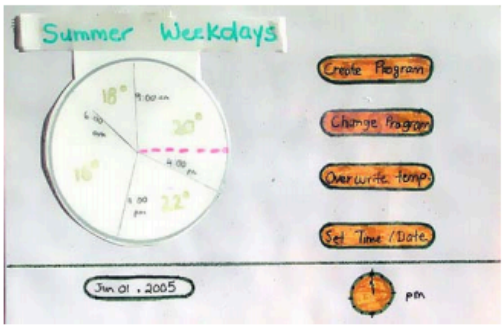


Figure 1. The "Circular" paper prototype

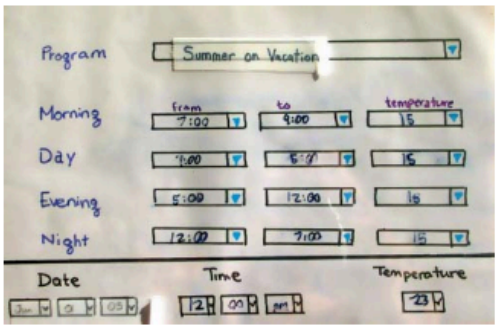


Figure 2. The "Tabular" paper prototype

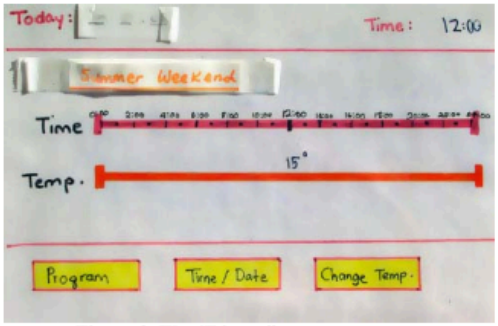
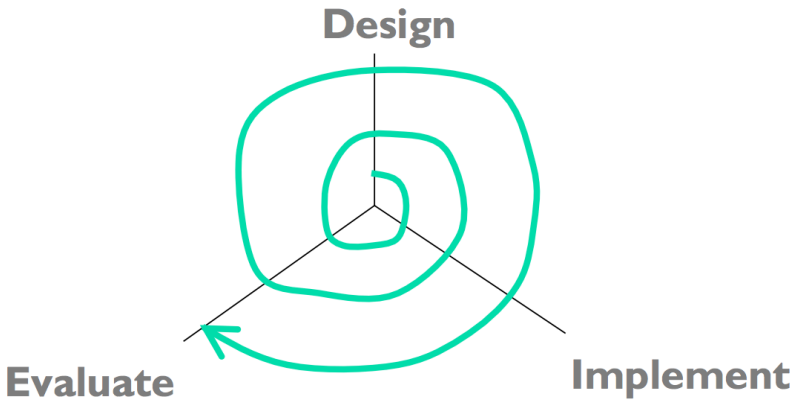


Figure 3. The "Linear" paper prototype

Fig. 1. The experiment manipulates when participants receive feedback during a design process: in serial after each design (top) versus in parallel on three, then two (bottom).



Don't fixate on one approach too early. Instead, keeping multiple alternatives on the table helps with all parts of the user-centered design process - design, implementation, and evaluation. Human beings need multiple alternatives to be creative and give good feedback. Here's some evidence.

- For individual designers: designers produce designs that are more creative and divergent when they keep multiple designs around throughout the iterative process. They also feel more confident about their designs, and the resulting final design is objectively better. (Dow et al., "Parallel Prototyping Leads to Better Design Results, More Divergence, and Increased Self-Efficacy," TOCHI, 2010).
- For groups: when you're sharing ideas with a group, sharing multiple ideas is better than sharing your single favorite. The group is more likely to integrate

parts of multiple ideas together, the group explores more of the design space, and others in the group provide more productive critiques. (Dow et al., "Prototyping Dynamics: Sharing Multiple Designs Improves Exploration, Group Rapport, and Results," CHI 2011).

- For users: users give more constructive critiques when they're asked to use multiple alternative prototypes. (Tohidi et al., "Getting the Right Design and the Design Right: Testing Many Is Better Than One," CHI 2006.)

Two reasons why multiple alternatives help. First, humans are better at comparing things than they are at judging the absolute value of one thing in isolation. Second, presenting only one idea puts a lot of emotional weight on it, so the idea's presenter feels obliged to defend it, and others feel reluctant to criticize it.

Case Study: IDEO Shopping Cart

Watch this video: https://www.youtube.com/watch?v=2Dtrkrz0yoU

In the video, where does IDEO collect information from users and observations? What problems and goals do they discover from their observation?

Case Study: A Story of Doug Dietz from GE Healthcare

https://www.ideou.com/blogs/inspiration/from-design-thinking-to-creative-confidence

Re-design of MRI for Children

"New opportunities for innovation open up when you start the creative problem-solving process with empathy toward your target audience."