Human Computer Interaction (HCI)

Week 6: Brainstorming & Ideation

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Week 6 Outline

- Early ideation and the different phases
- Divergent thinking
- Convergent thinking

what is ideation?

what is ideation?

- Generating as many ideas as possible – for a given design brief
- Goal: To up with lots of new ideas that you did not have initially
- Then narrow down, refine those considered best, and iterate

what is ideation?



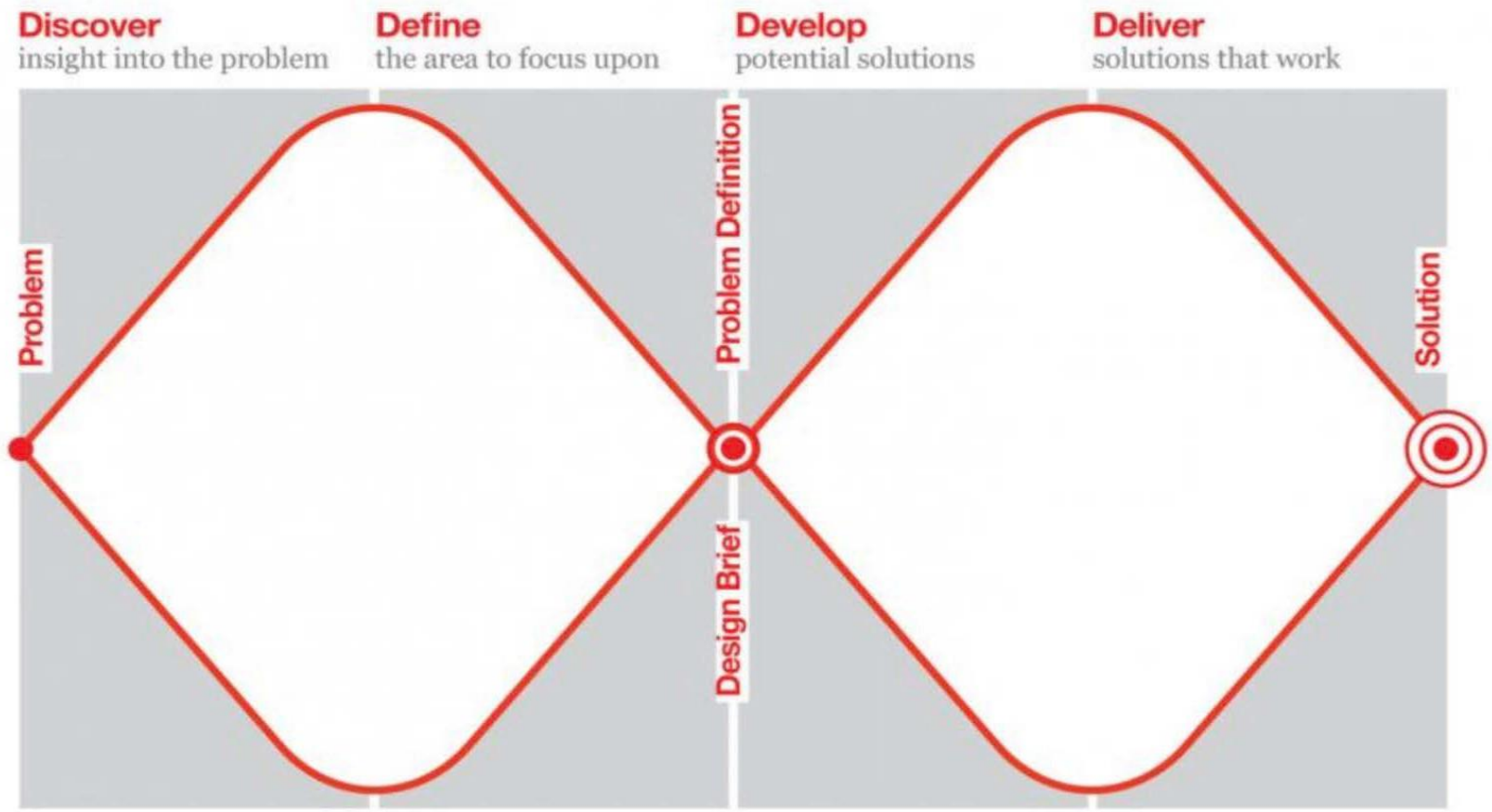
Divergent thinking

Many possible solutions

Convergent thinking

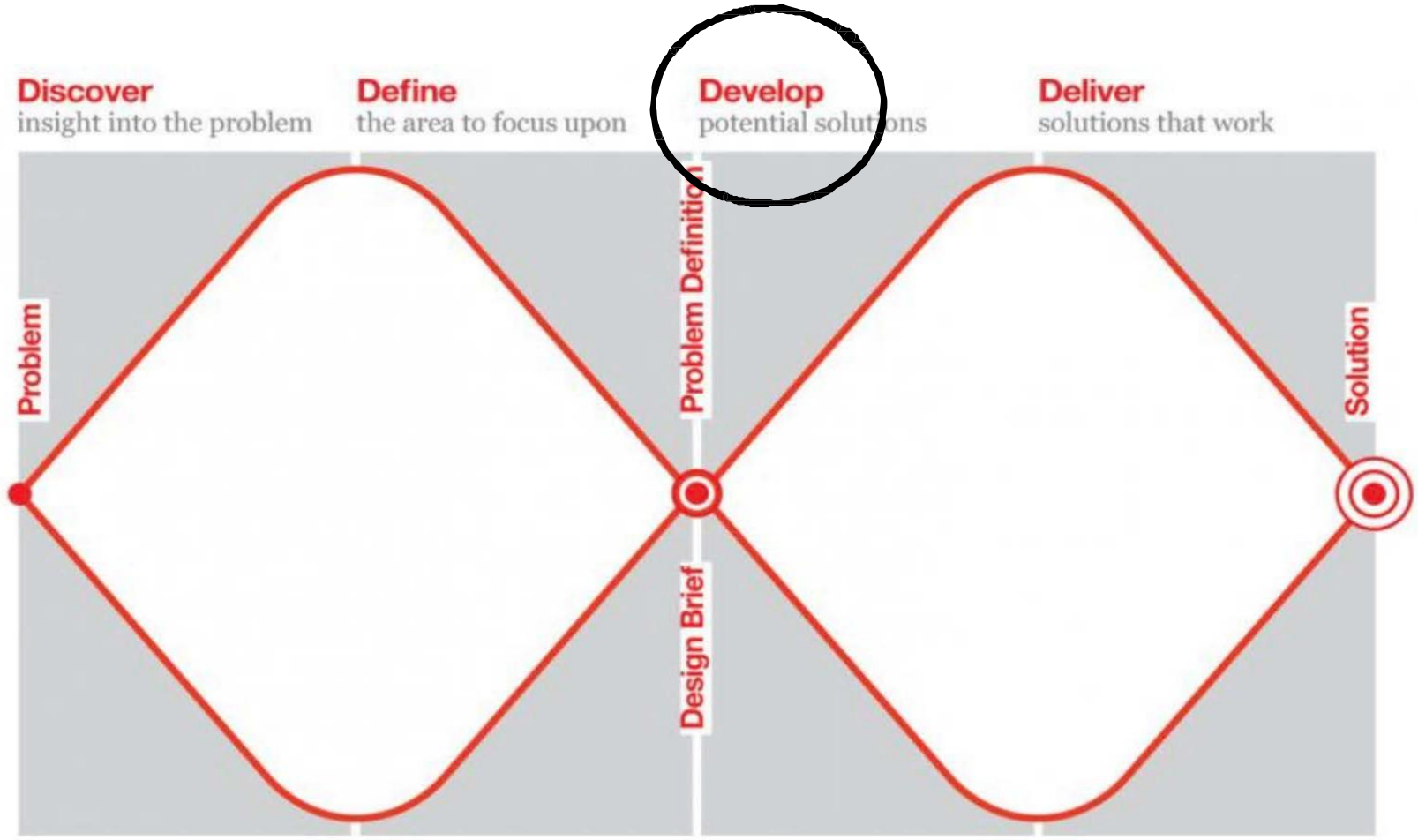
Developing a “good” solution

when do we need ideation?



British Design Council, 2004: The Double Diamond
https://www.designcouncil.org.uk/our-work/news-opinion/double-diamond-universally-accepted-depiction-design-process

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what is the value of ideation methods?

- You might gravitate towards (and get “stuck” on) an “obvious” idea
- Sometimes difficult to come up with more than a few ideas - especially without a set process/method in place

→ Ideation is all about getting you to think outside the box

how might we ideate?




Preparing for ideation

what should we have done before ideating?

what should we have done before ideating?

- Know what problem you are addressing!

- Understand the context and reason for the problem
- Know who your stakeholders and users are
- Understand what their needs and wants are



what should we have done before ideating?

- Understand the context and reason for the problem

Floor scrubbing robots were introduced at the airport in the wake of the Covid-19 pandemic. While initially, these robots were intended to be used in times of low foot-traffic, which was the case during the pandemic, over time they've been increasingly used during busy times. This has been leading to increased malfunctioning of the robots, which has had profound effects on janitorial staff's work. There have also been frustrations with how malfunctions are managed and janitorial staff feel that the current processes are further impacting and slowing down their work.



Derived from research by: Kang, Esther. Y., & Fox, Sarah. E. (2022, June).
Stories from the Frontline: Recuperating Essential Worker Accounts of AI Integration.
In *Designing Interactive Systems Conference* (pp. 58-70).

what should we have done before ideating?

- Know who your stakeholders are
  - Janitorial staff
  - Managers and shift supervisors
  - County Authority (makes executive decisions)
  - Engineers from Northfield Robotics

- Know what their needs/wants are
  - Janitorial staff need to feel that their voices and insights are heard by decision makers
  - Administrators would like a clearer line of communication with Northfield Robotics to anticipate robots' changes in behaviour and routes
  - …



distilling the problem

- Your research may reveal many possible problems or design briefs

- For ideation, it is important to narrow it down to the problem you actually want to address



“how might we…” questions

- One approach to narrow down the problem
- Questions to focus ideation, based on the problem in focus
- How might we…
  - Design technology that supports the work of janitorial staff?
  - Support better communication between janitorial staff and administrative staff?
  - Make the management of robot malfunctions quick and easy?



“how might we…” questions

- How might we…
  - Design technology that supports the work of janitorial staff?
  - Support better communication between janitorial staff and administrative staff?
  - Make the management of robot malfunctions quick and easy?
- Each question should afford different ideas, different forms of design



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  - Support better communication between janitorial staff and administrative staff?
  - Make the management of robot malfunctions quick and easy?
- Each question should afford different ideas, different forms of design
- Questions should be broad enough to inspire creativity, rather than point to specific solutions already



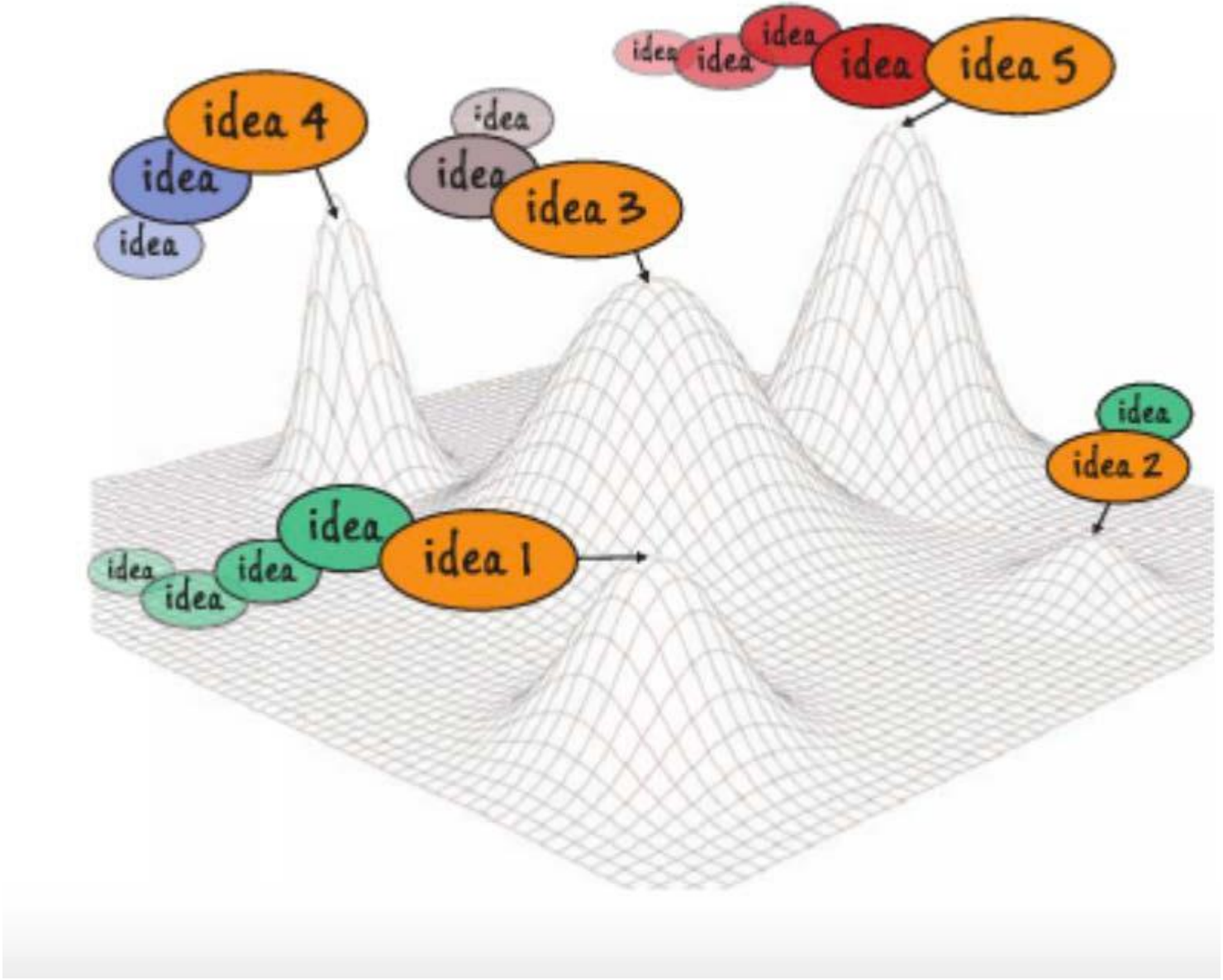
”how might we…” questions

- How might we…
  - Design technology that supports the work of janitorial staff?
  - Support better communication between janitorial staff and administrative staff?
  - Make the management of robot malfunctions quick and easy?

- Negative example
  - How might we create an app that tells administrative staff when a robot has malfunctioned?



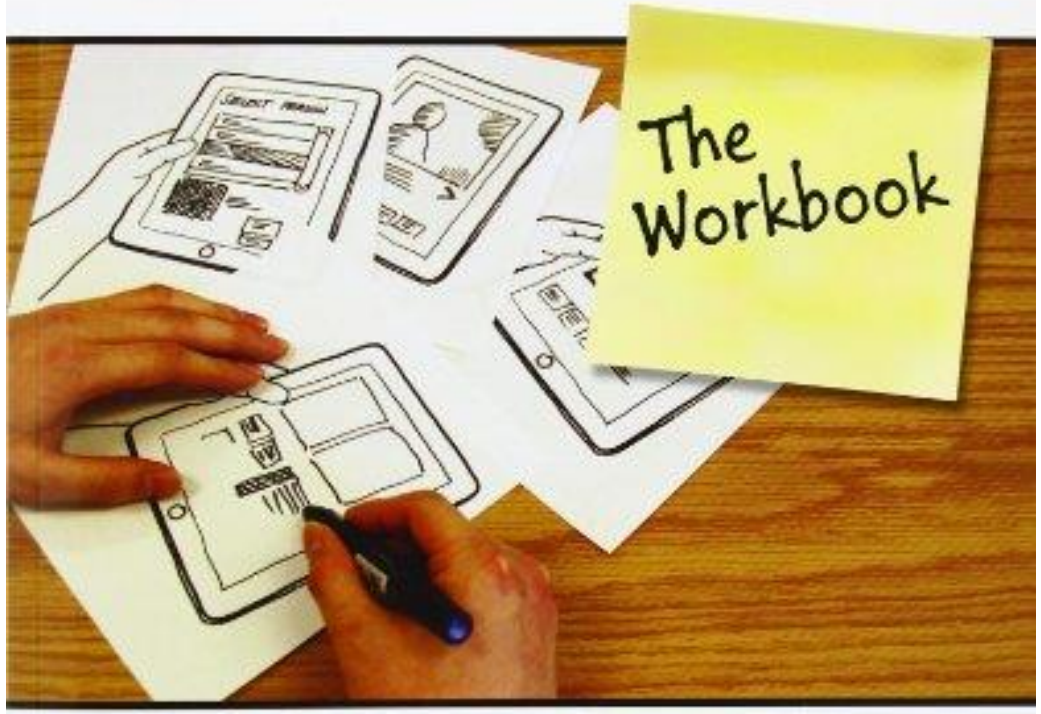

Divergent
thinking



Divergent thinking

Greenberg, Saul. Sketching User Experiences. 1st edition. Waltham, Mass: Elsevier, 2012. Print.

Sketching USER EXPERIENCES



Saul Greenberg
Sheelagh Carpendale
Nicolai Marquardt
Bill Buxton

MK

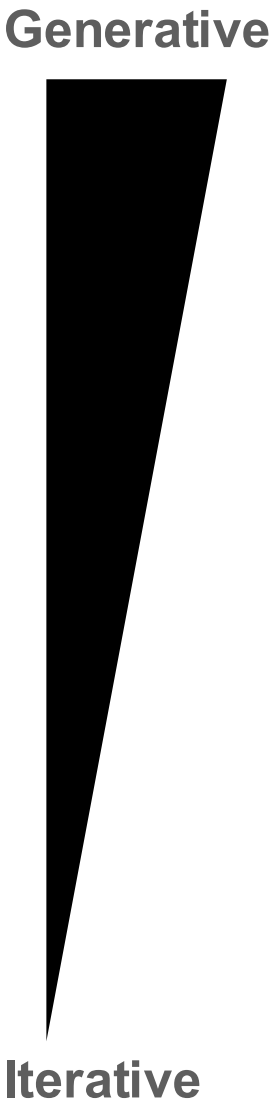
what are the goals of (early) ideation?

- Quantity > Quality
- Diversity
- Novelty over relevance
- Going beyond the obvious
- Wild ideas welcome
- High level thinking - no details



ideation methods

- Brainstorming
- Mindmaps
- Crazy 8s
- Crowdstorming
- Metaphors
- Sketching
- Mash-ups
- Storyboards
- … many more





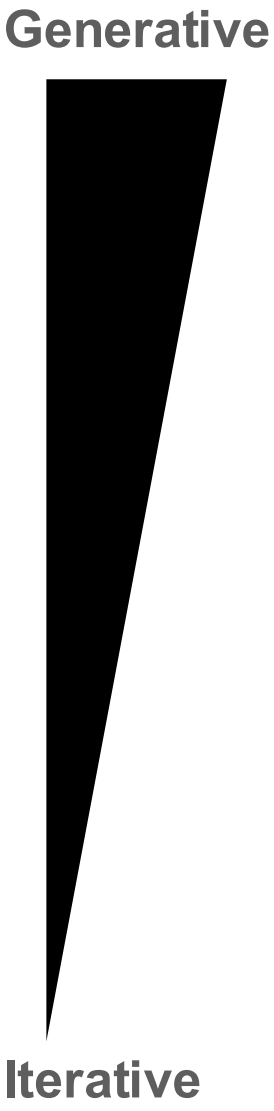
ideation methods

- All these are about coming up with ideas
- All give the ideation a few simple rules to help it along, e.g.,
  - Time limits
  - Promoting discussion (e.g., active listening, using ‘yes and?’)
  - Helping you connect ideas together (e.g., connecting ideas physically)



ideation methods

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- … Many more



Divergent thinking

brainstorming



brainstorming rules

- Typically has a time limit
- Can be done individually and/or in groups

- Ground rules
  - Don’t be judgmental - let ideas flow
  - Encourage wild ideas
  - Build on the ideas of others
  - One conversation at a time
  - Be visual (include sketches)
  - Go for quantity



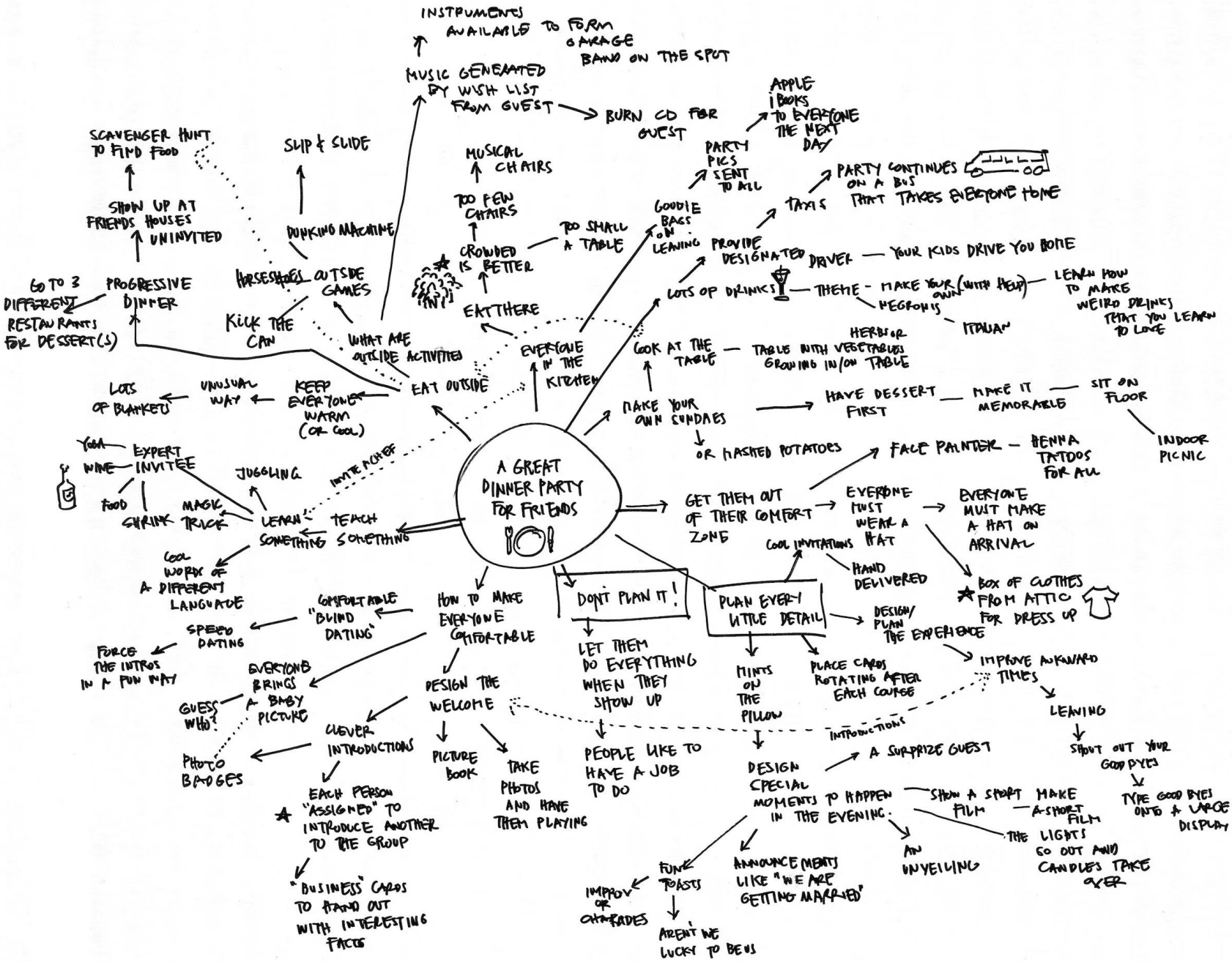
brainstorming pros & cons

- Pros
  - Highly generative
  - Enables group discussion and re-framing the problem together

- Cons
  - Not everyone always contribute
  - Some people might dominate the discussion
  - Sometimes the ideas that come out are not very individual



mindmapping



Divergent thinking

Image: https://www.ideo.com/blog/build-your-creative-confidence-mindmaps

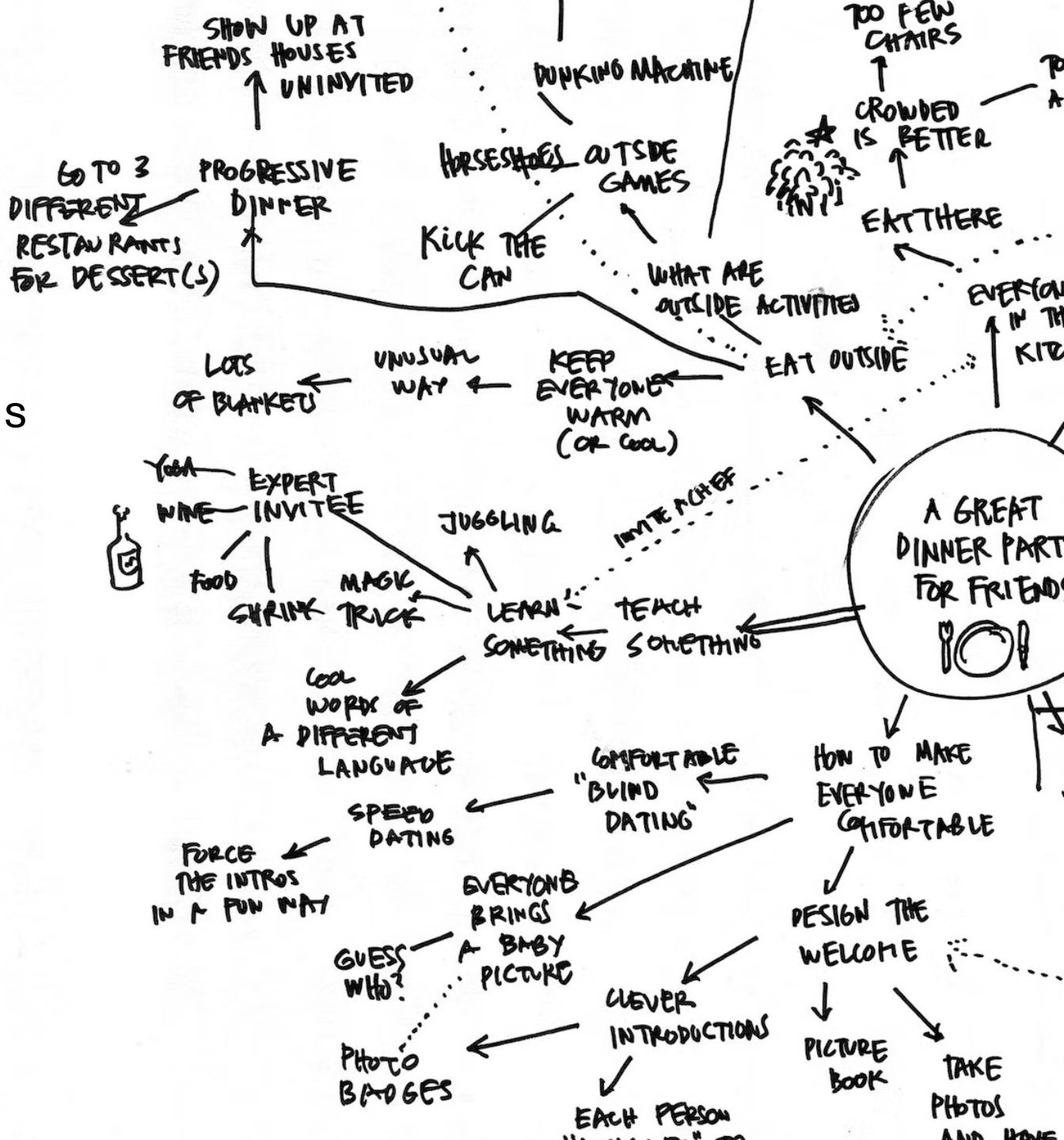
mindmapping

- Begin with the main concept in the middle
  - e.g., a “How Might We” question
- Add branches with high-level thoughts on the main concept
- Expand each branch with new nodes, and add new branches
- Add connections between different themes



mindmapping

- Pros
  - Very easy to expand concepts (as opposed to brainstorming)
  - Make connections during the ideation session
- Cons
  - Can be a bit messy and hard to decipher
  - Easy to get stuck on one branch



crazy 8s



Divergent thinking

crazy 8s

- Fold your piece of paper three times
- Draw 8 ideas in 8 minutes
  - 1 minute to draw each idea

- Try to get something down on the page every time
- Don’t overthink it
- Each concept has to be distinct



how do we refine and narrow down?



Divergent thinking

Many possible solutions

Convergent thinking

Developing a “good” solution



determining fit, ranking, and clustering

voting


Round 1
Add an Android version
Yang's first idea
Add a social element to the app
Oscar's first idea
Have a section that helps gym goers find a gym buddy
Rachel's first idea
Location tracking, tells you how long you spend at the gym automatically
Have a leaderboard for people who have set gym records
I think it would be important to make the gym a judge free zone. Maybe we can help with that in the app?
Round 2
Provide an incentive if they download the app
Users can post pictures and videos so other gym members can see them
Yang's idea after reading Oscar's idea
A lot of people go to the gym to meet people, maybe there could be a way to have your profile public
Oscar's idea after reading Rachel's idea
Phones can track how many steps you take
Rachel's idea after reading Preston's idea
Let's just require members to get the app
We could fine anyone that participates in body shaming
Round 3
Rewards program
Users can post comments/like on Instagram and Facebook
Have a QR code scanner feature for people to add friends to their gym network
Yang's idea after considering the ideas above
Oscar's idea after considering the ideas above
An option to send a video of lifting weights to a trainer to get help on improving form
Gym-rat free zone!
Round 4
Referral program
App users should be able to share music and playlists they like
Each treadmill should have a QR
scanner that
scan your app t
do something
Have a "Member Moment" with gym members
Create a technology that virtually gives feedback in real time using a phone's front-facing camera
There needs to be a better way to collect member's data

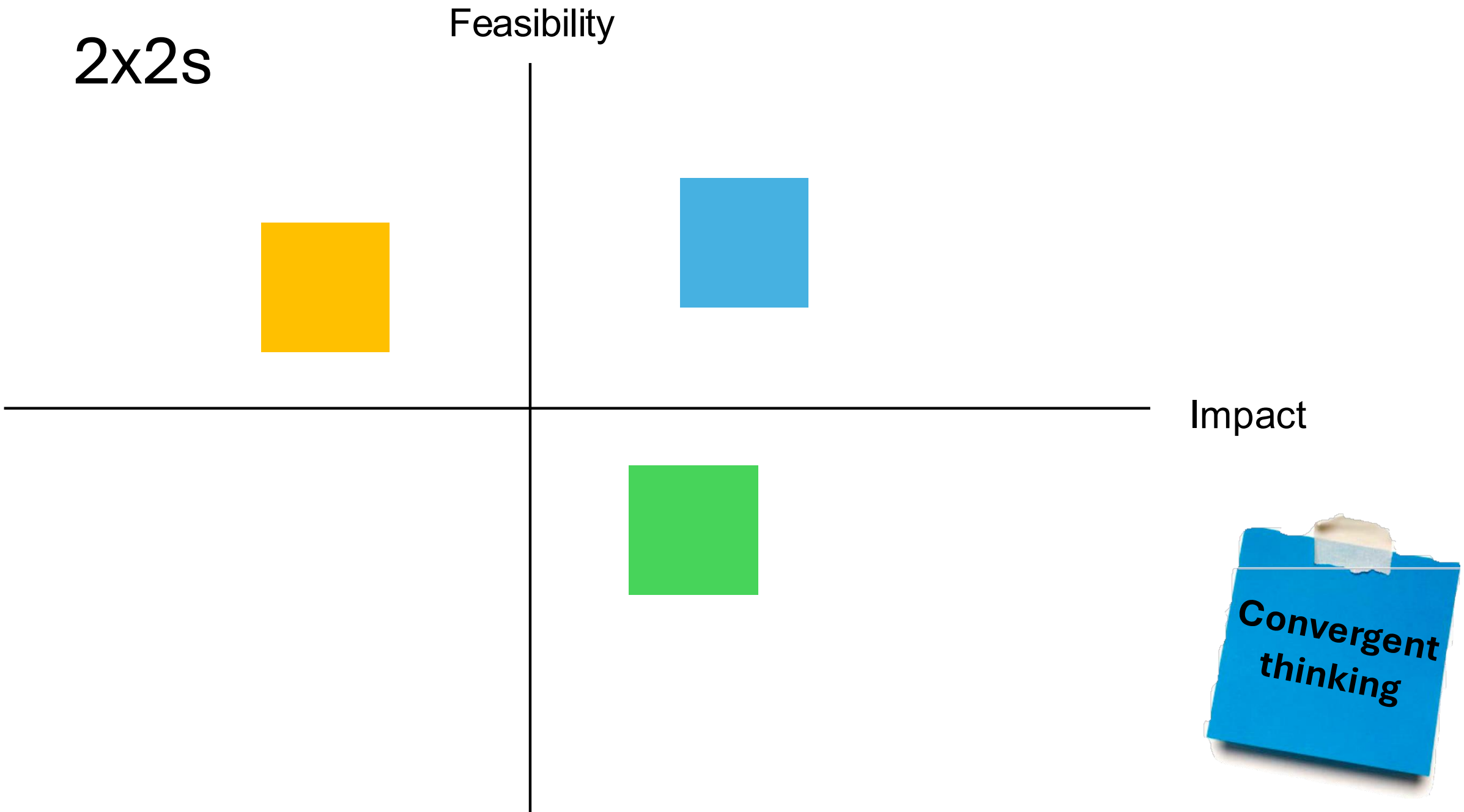
2x2s

Dimension 1

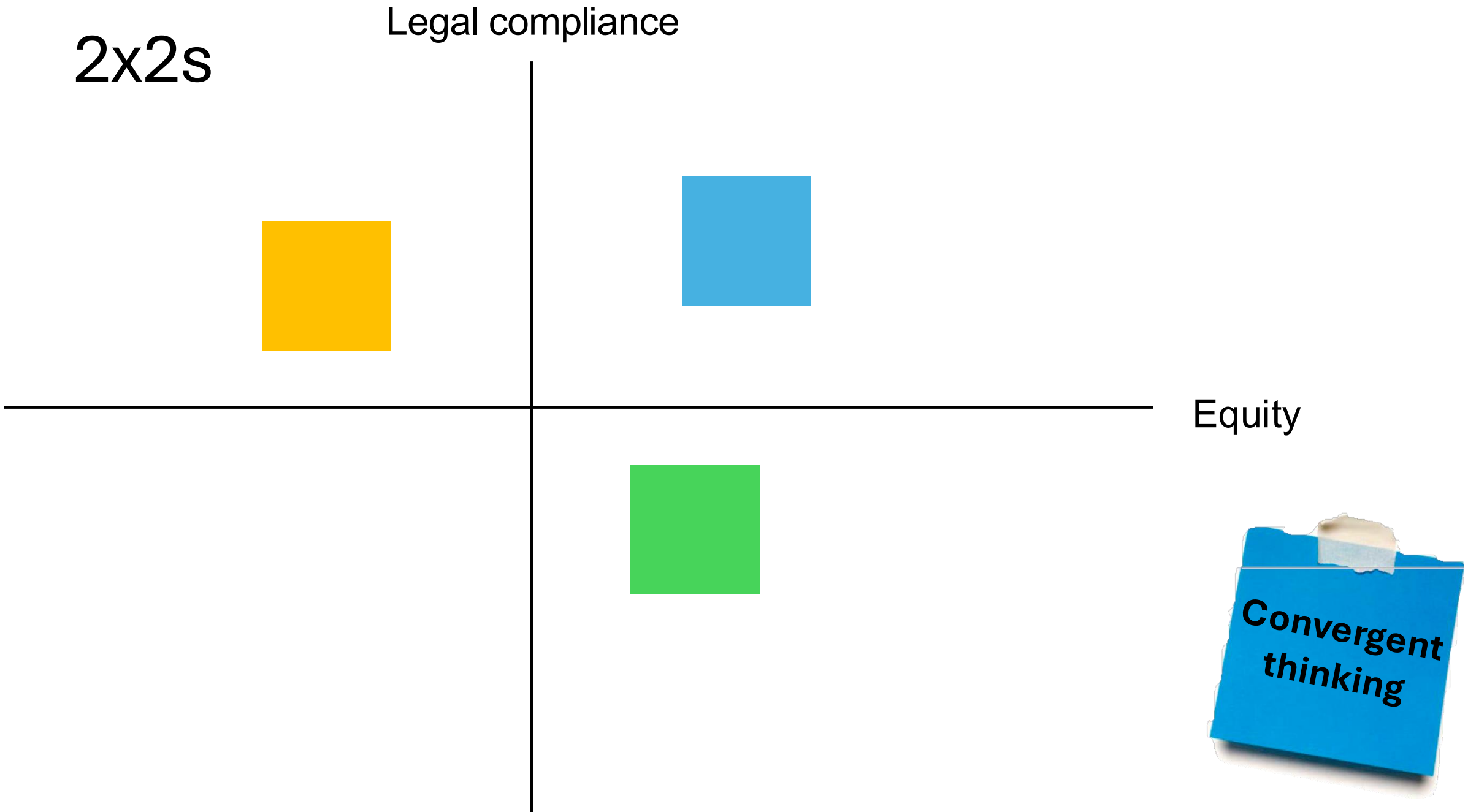
Dimension 2



2x2s



2x2s



affinity mapping





combining ideas

- How might we address post-natal chronic back pain?

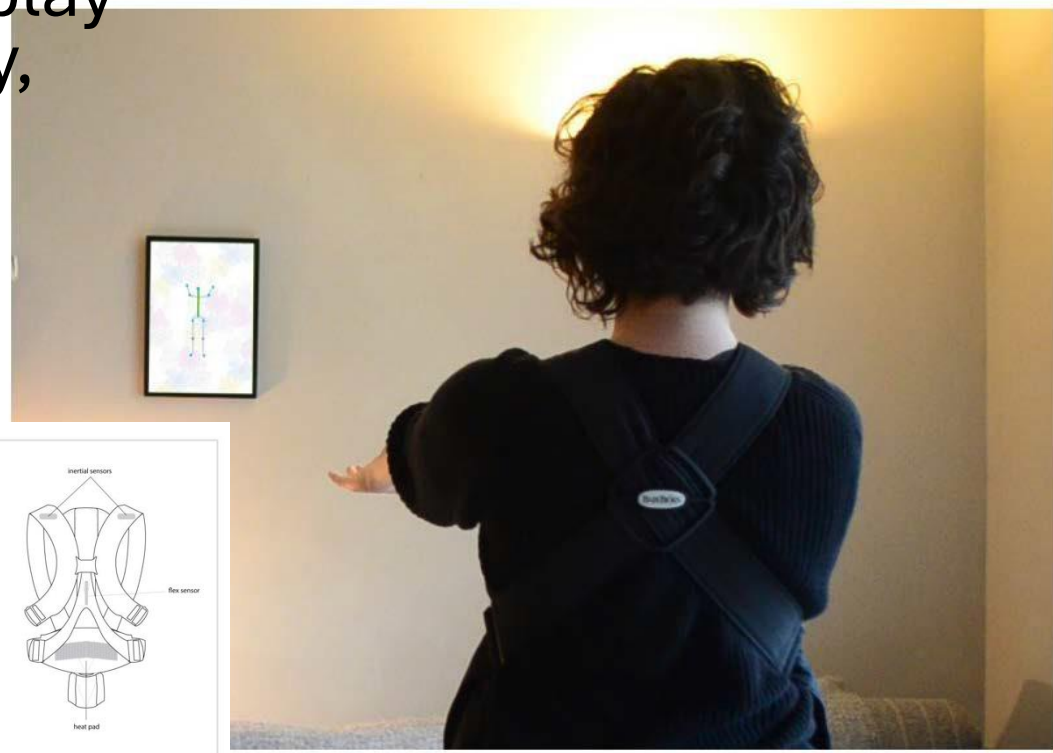
A wearable baby carrier with posture sensors and a heating pad for providing symptom relief

An ergonomic backpack with sensors for monitoring posture and avoiding excess weight

A physical in-home visualization device tracking progress in exercise and pain symptoms, to encourage long-term treatment

combining ideas

- Baby carrier with sensors that monitor for spine movements that exacerbate PNCBP
- Connected by Bluetooth to a digital display that guides users through physiotherapy, also using the sensors



Di Cuia, D., Janovica, J., Lechelt, Z., Li, S., & Purewal, H. (2016). CarryLine: A Tool for Management and Rehabilitation of Post-Natal Chronic Back Pain.
In *Proceedings of the CHI'16* (pp. 26-31).

how might we ideate?



AI & ideation

“My team does use A.I. to help clients implement at scale the designs we’ve created. That is A.I. doing what it’s good at: taking something already defined by a human and iterating on it efficiently.

Where we won’t use A.I. is during the discovery, listening and thinking phase. Crucial information surfaces in early conversations. We learn what people are afraid of, what they’ve tried that didn’t work and what they believe versus what they have learned to perform. A.I. can scan annual reports and map the competitive landscape, but the strategic picture that actually matters doesn’t live in documents.”

Giorgia Lupi; Information Designer

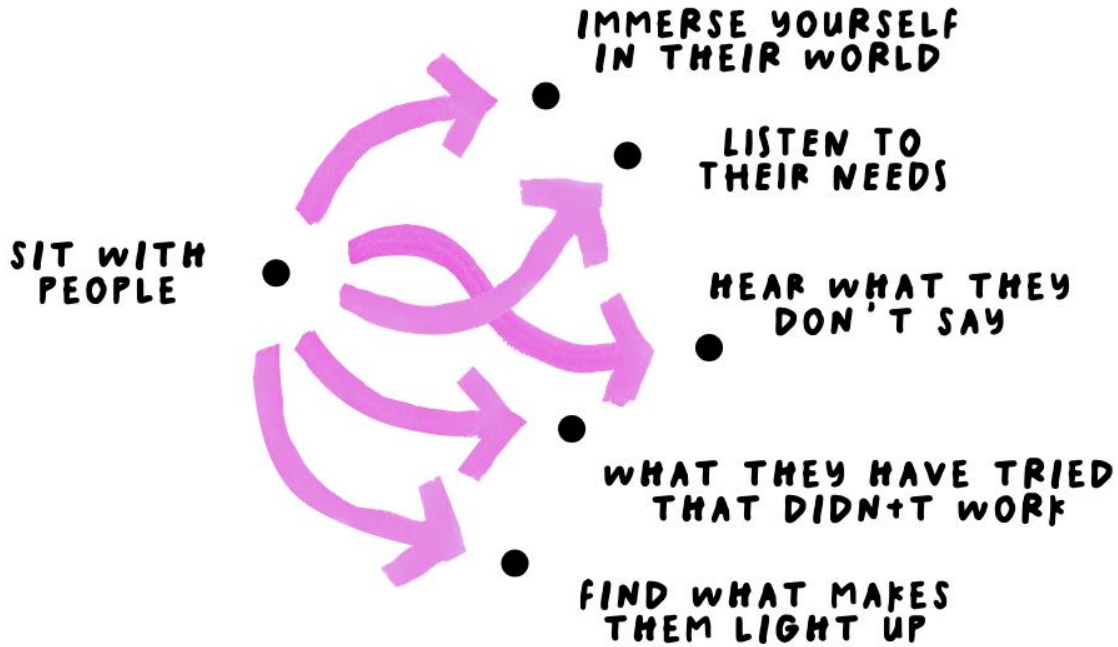
Giorgia Lupi. In Defense of the Detour. NY Times, Sept. 22, 2026
https://www.nytimes.com/interactive/2026/09/27/opinion/ai-art-creativity.html

In my own practice, the process looks something like:



Giorgia Lupi. In Defense of the Detour. NY Times, Sept. 22, 2026
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You talk to people. A lot of them. You listen and you learn about their needs and specific context.



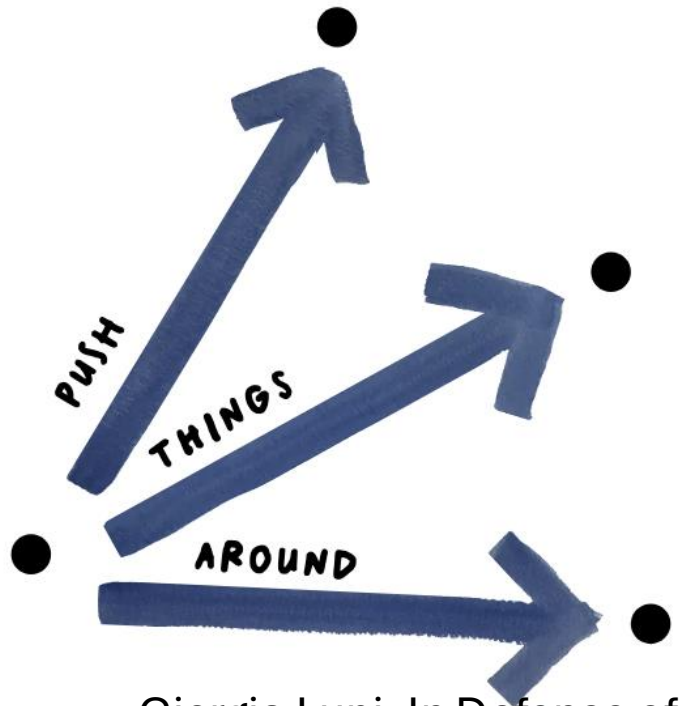
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You dig through visual references and accidentally find something you were not looking for.



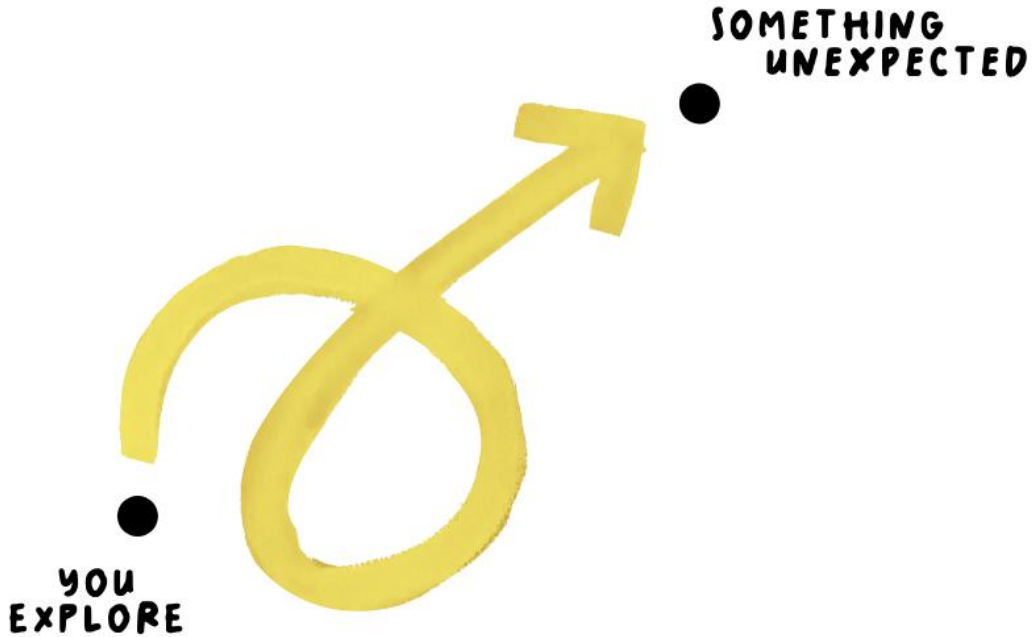
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You push things around on paper, or on a screen, and land somewhere unexpected.



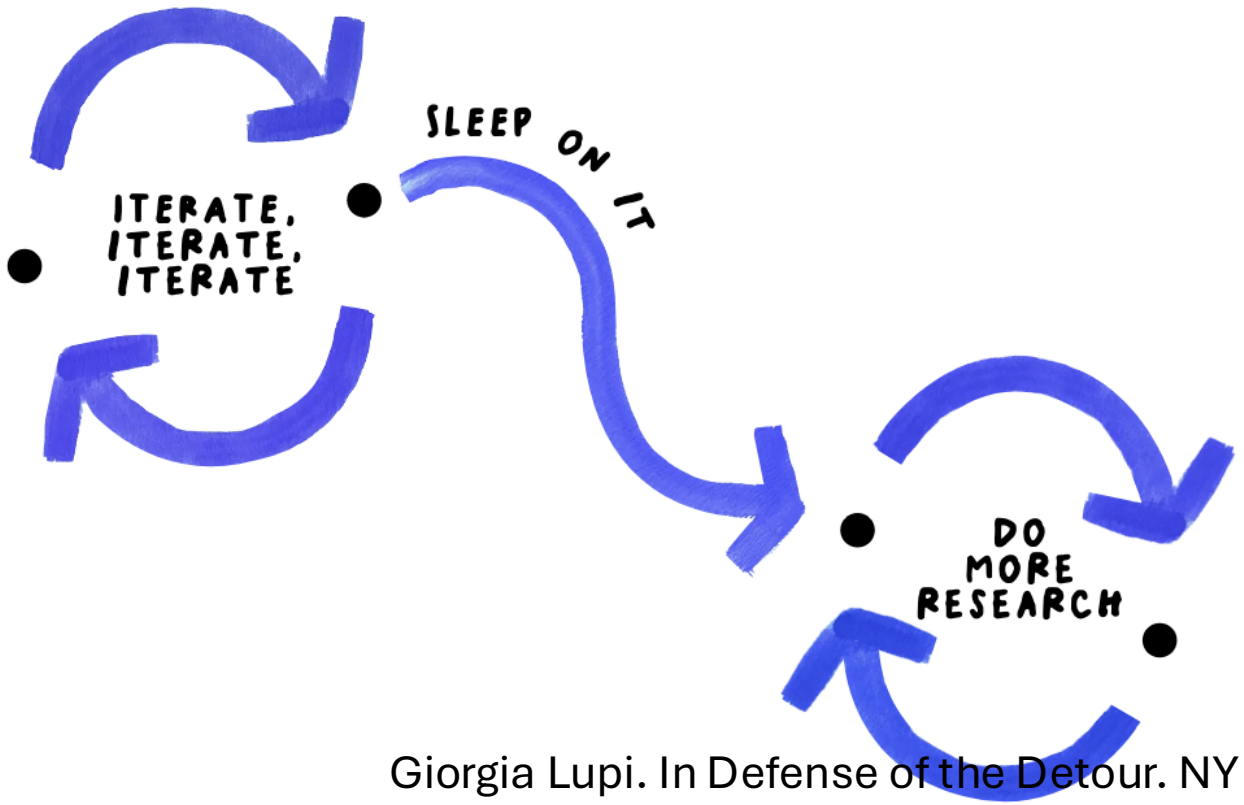
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You fail in a way that opens up a completely unexpected direction.



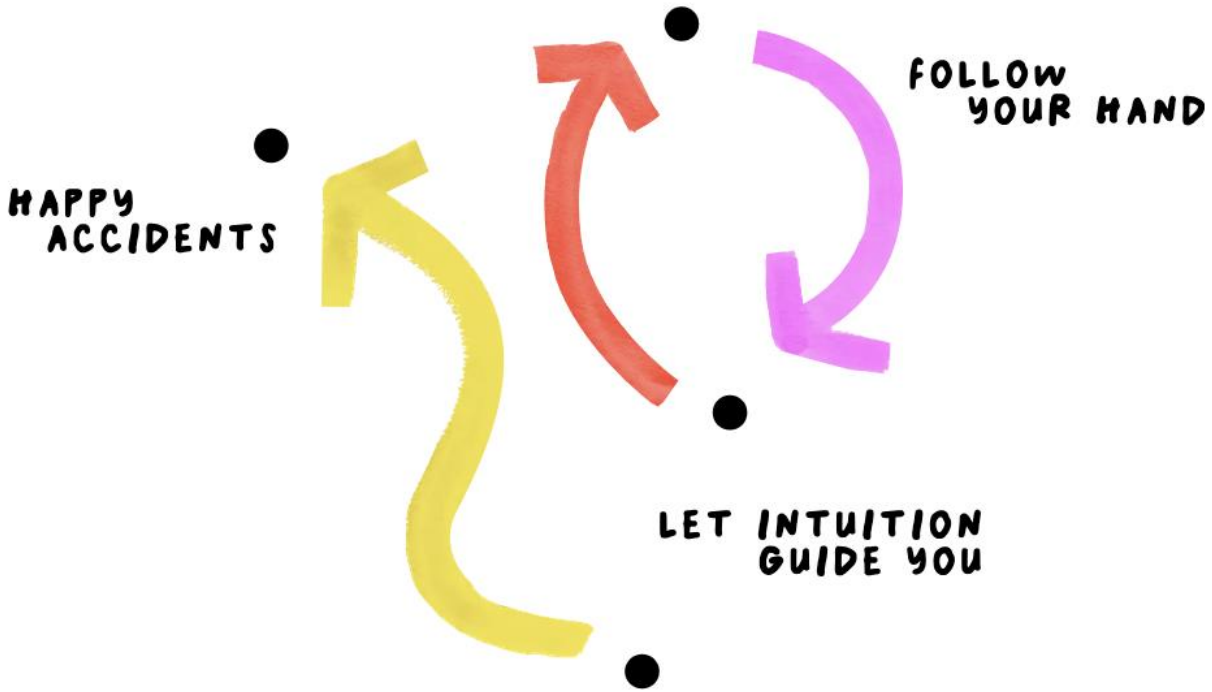
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You revisit. You refine. You look in another direction. You refine again.



Giorgia Lupi. In Defense of the Detour. NY Times, Sept. 22, 2026
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And the wandering is where a lot of the actual design happens.



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AI & ideation

“The greatest contributions to humanity — art, inventions, even products — show evidence of people who got lost in a problem and came out the other side with an idea they would not have found otherwise. **That does not happen by taking a shortcut to the center. It happens in the detours**.”

Giorgia Lupi; information designer

Giorgia Lupi. In Defense of the Detour. NY Times, Sept. 22, 2026
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Next steps

- Week 07 Tutorial
  - Group check in on CW1: Where are you at? What challenges are you facing?
  - From findings to design considerations
  - Early ideation techniques

- Week 07 Lecture
  - Physical & digital prototyping

Any questions?