Design thinking:
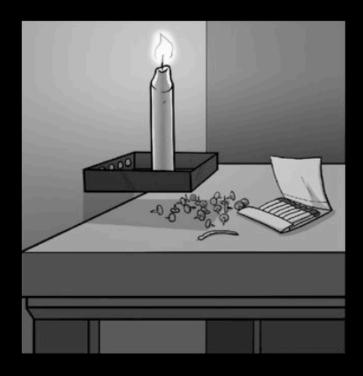## examples of major pitfalls

CandleProblem

How to fix a lit candle on a wall in a way so the candle wax won't drip onto the table below. To do so, one may only use a book of matches and a box of thumbtacks

[Duncker, 1945]

CandleProblem

How to fix a lit candle on a wall in a way so the candle wax won't drip onto the table below. To do so, one may only use a book of matches and a box of thumbtacks

FunctionalFixedness

Functional fixedness is a cognitive bias that limits a person to using an object only in the way it is traditionally used

A "mental block against using an object in a new way that is required to solve a problem"

[Duncker, 1945]

FunctionalFixedness

Group 1:
Preutilization
Boxes presented as a container with materials inside them

Group 2:
No Preutilization
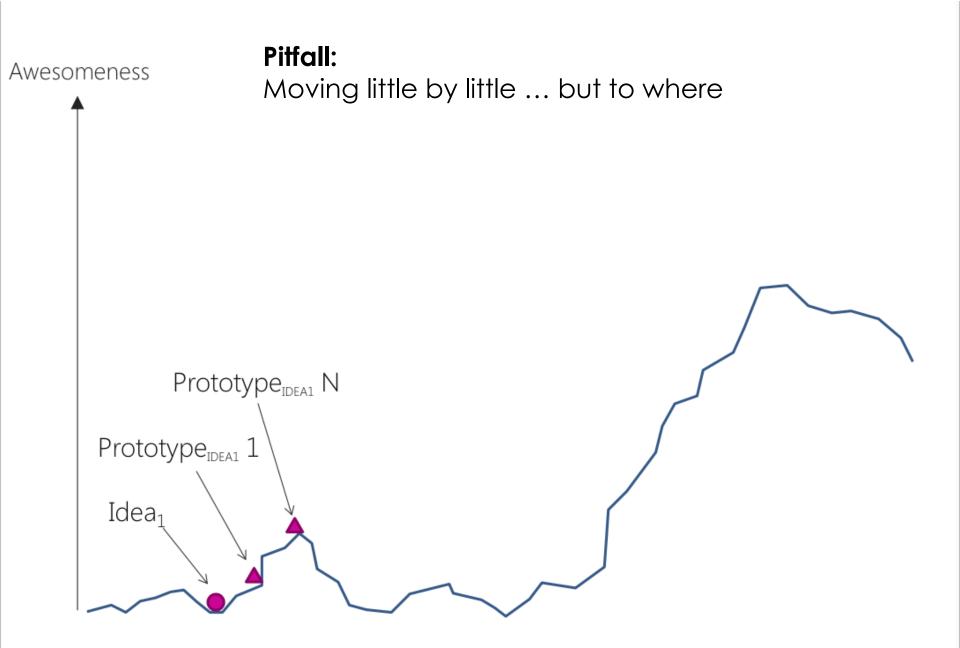Boxes were presented empty

[Adamson, 1952]

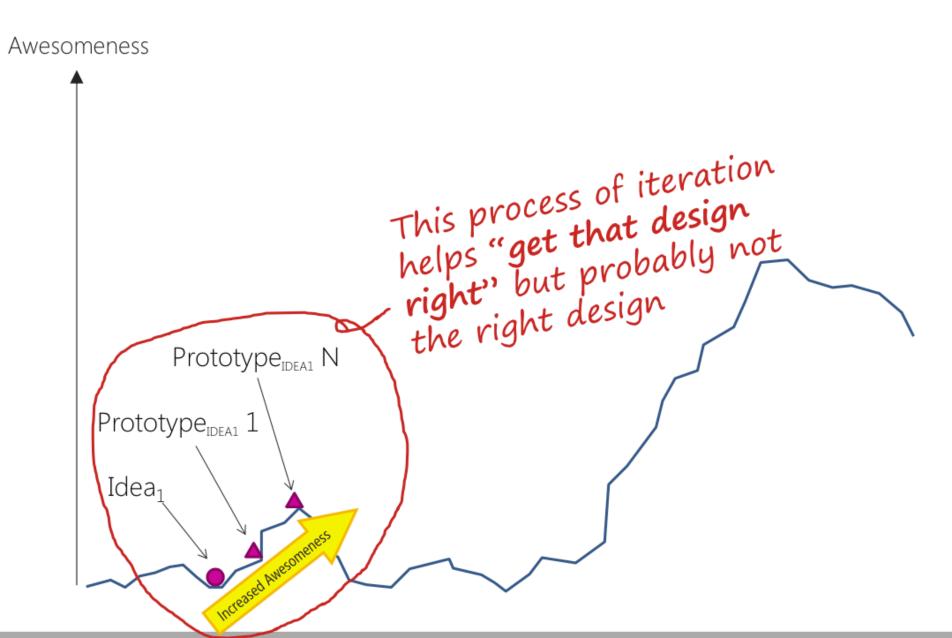"Getting the **design right** and the **right design**."

Bill Buxton
Principal Researcher at Microsoft Research
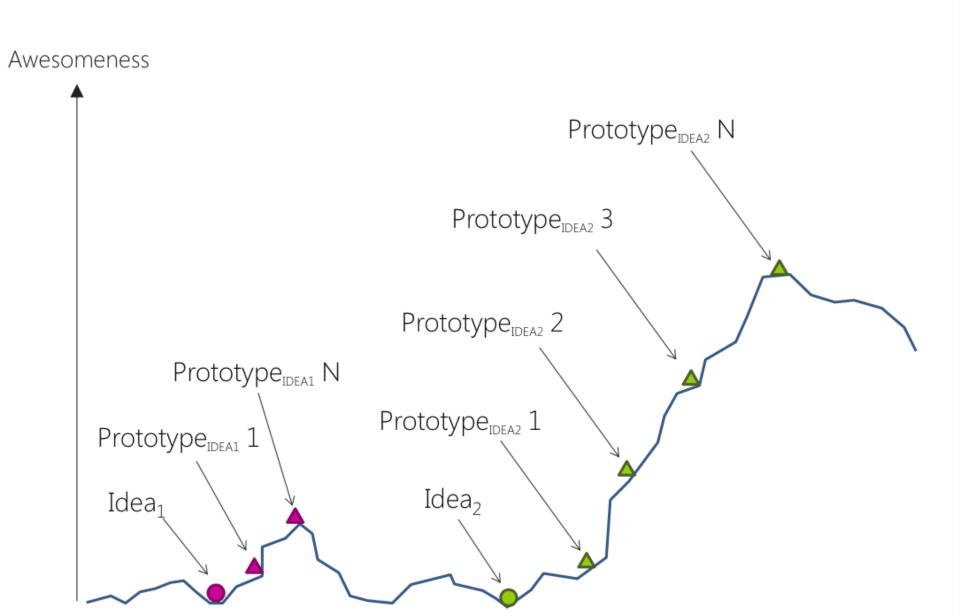One of the more influential figures in IxD
Quote from: Buxton, *Sketching User Experiences*, 2007

Awesomeness

Pitfall:
Moving little by little … but to where
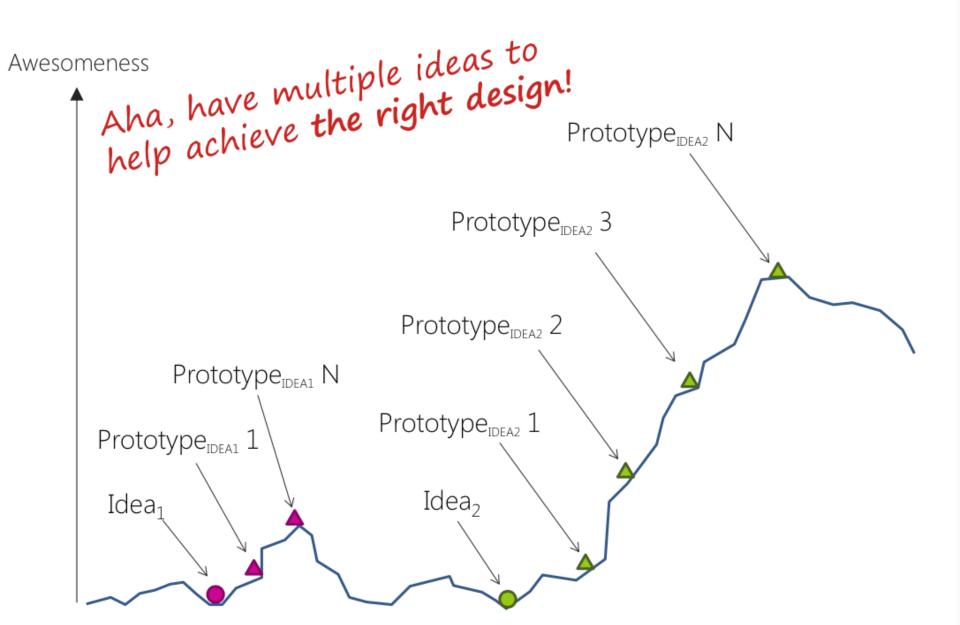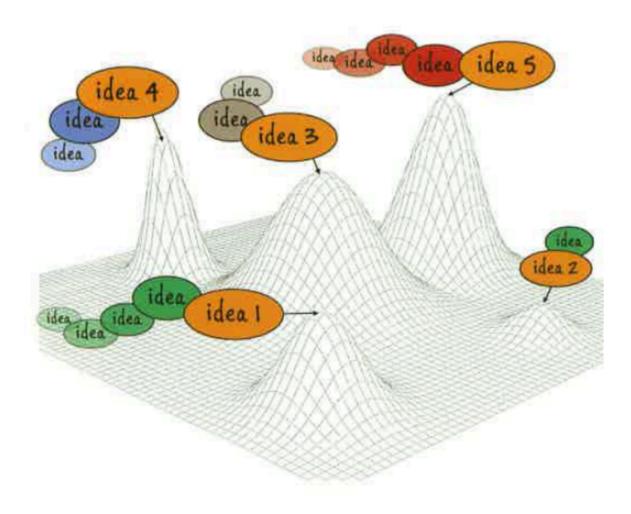
Prototype$_{IDEA1}$ N

Prototype$_{IDEA1}$ 1

Idea$_1$

Awesomeness

This process of iteration helps "**get the design right**"

Prototype$_{IDEA1}$ N

Prototype$_{IDEA1}$ 1

Idea$_1$

Increased Awesomeness

Awesomeness

Prototype$_{IDEA1}$ N

Prototype$_{IDEA1}$ 1

Idea$_1$

Increased Awesomeness

This process of iteration helps "**get that design right**" but probably not the right design

Awesomeness

Prototype$_{\text{IDEA2}}$ N

Prototype$_{\text{IDEA2}}$ 3

Prototype$_{\text{IDEA2}}$ 2

Prototype$_{\text{IDEA1}}$ N

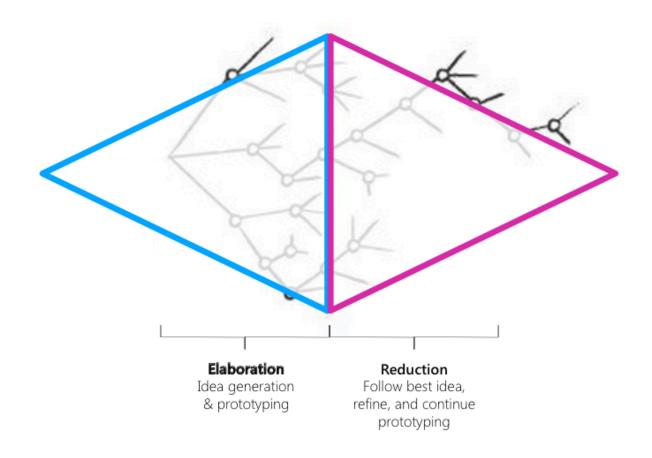Prototype$_{\text{IDEA2}}$ 1

Prototype$_{\text{IDEA1}}$ 1

Idea$_1$

Idea$_2$
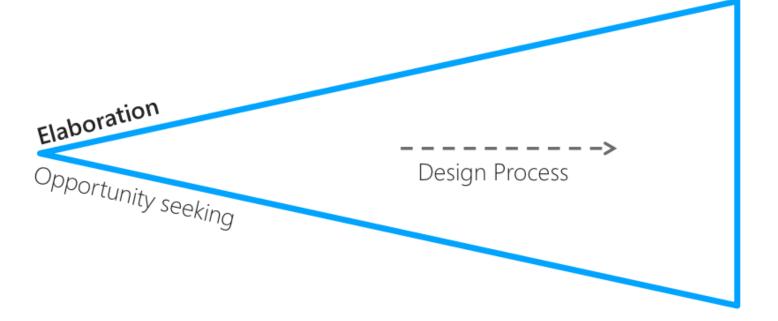
Consider many ideas to overcome this problem

Elaboration
Idea generation
& prototyping

Reduction
Follow best idea,
refine, and continue
prototyping
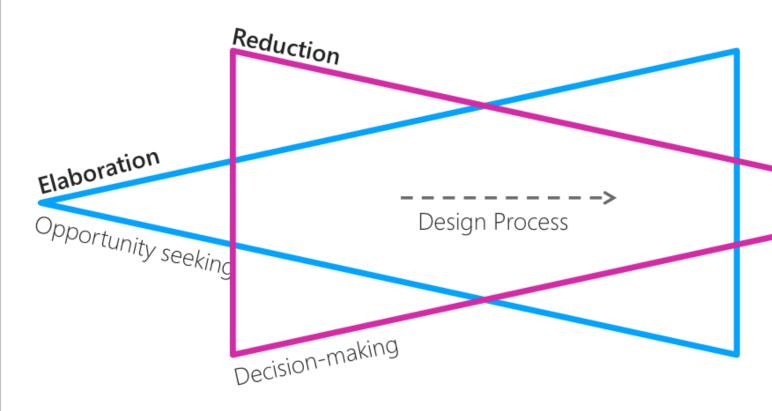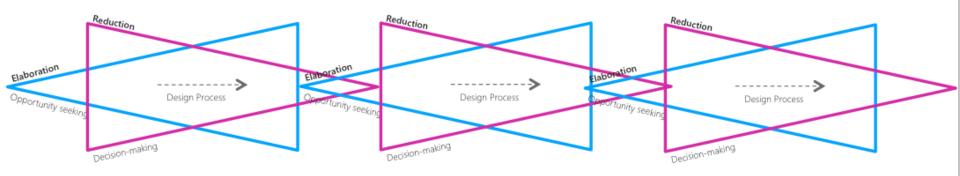
Elaboration

Elaboration

Opportunity seeking

Design Process

Elaboration and Reduction

Reduction

Elaboration

Opportunity seeking

Design Process

Decision-making

Elaboration and Reduction

*"The best way to have a good idea is to **have lots of ideas.**"*

Linus Pauling
Professor of Chemistry
Caltech, UC San Diego, Stanford
Only person awarded two unshared Nobel Prizes

IDEOBrainstormingRules

1. Be visual

2. Defer judgment

3. Encourage wild ideas

4. Build on the ideas of others

5. Go for quantity

6. One conversation at a time

7. Stay focused on the topic

[Kelley, The Art of Innovation]
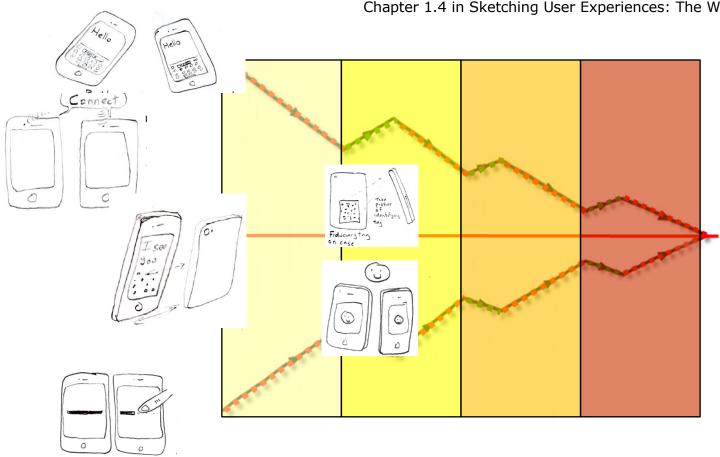
BRAINSTORMING FUNDAMENTALS

Great brainstorming is one of the most powerful and one of the most misunderstood methods in the in the innovators toolbox. It's a special kind of collaboration with specific rules of behavior designed to maximize idea generation.

Many say they know how to brainstorm. Few do it really well. In some ways, brainstorming is like volleyball. If you know the rules, you might be able to survive a social game at the neighborhood picnic. But this is a far cry from the kind of volleyball you watch on TV. No matter what level you're at, you can always up your game.

We hope to do the following today:
1. (Re)-introduce you to the rules of brainstorming so you can start to employ it when appropriate in your group process.
2. Uncover some of the more unspoken rules behind leading a good brainstorm. These we include later in the handout as a facilitator's crib sheet.

10+10
Descending the Design Funnel

Chapter 1.4 in Sketching User Experiences: The Workbook

THE 10 PLUS 10 METHOD

1. **State your design challenge**

   - problem to solve
   - client need
   - novel system that takes advantage of particular technology…

2. **Generate 10+ different design concepts that addresses that challenge**

   - brainstorming
   - be as creative and diverse as possible
   - don't judge designs
   - capture essence of idea, not details

THE 10 PLUS 10 METHOD

3. **Reduce the number of design concepts OR repeat**

    - review all designs
    - discard ones that don't have merit
    - use sketch to explain and get feedback on remaining designs from others
    - gather reactions (including your own)

    OR

    - Based on reflection, repeat step 2

4. **Choose the most promising concept(s)**

    - Your starting point

THE 10 PLUS 10 METHOD

5. **Produce 10 details / variations of that concept**

   - explore the concept
   - generate different ways of realizing the concept
   - dig deeper in a particular way (i.e., flesh out details)

6. **Present your ideas to a group**

   - coffee / donuts go a long way
   - solicit feedback (positive, what could be improved, etc.)
   - Suggestions about redesigns

7. **As your ideas change, sketch them out**

   - that is, go back to step 1, but deeper into the design funnel

Literature Review

10 PAPERS PLUS 10 APPS

Identify 10 papers that relate to your idea.

- You can do this using Google Scholar, the ACM Digital Library or by looking at recent conferences, e.g. Mobile HCI 2017, UbiComp 2017.

Identify 10 apps that relate to you idea.

- You can do this via the Google Play or Apple App Store.