Week 1-2
Human-Centered Design

SFWRENG 4HC3/6HC3 Human Computer Interfaces

** Slides adapted from previous instructors of COMPSCI/SFWRENG 4HC3/6HC3*

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Quick Items

- Read syllabus carefully and **sign the academic integrity pledge** on Avenue for access to submission boxes.
- Tutorials start next week

Recap

- What is an interface (not Java interface)?

- Some terminologies:
  - UI
  - UX
  - HCI
  - HCD

Week 1 Goals

- ~~Wednesday~~
  - ~~Course Introduction~~
  - ~~Syllabus and Course Policies~~
- **Friday**
  - **HCI and Human-Centered Design Process**

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Warm-up Activity

An Interface Experiment:
https://userinyerface.com/

User Inyerface

00:05:43

YOU ARE AWESOME!

A true interface legend.

Consequences of Bad Design

What are some consequences of bad design?

Consequences of Bad Design

What are some consequences of bad design?

- **Prevent** you from completing the task
- **Frustrating** experience
- Cause **errors** during the usage
- May have **serious consequences** with **critical systems**
  - Think about safety-critical system such as response system in the 911 call centers

What is the challenge?

Ensuring that the designs matches the needs and capabilities of the people for whom they are intended.

Bloomberg

Silicon Valley's $400 Juicer May Be Feeling the Squeeze

Two investors in Juicero were surprised to learn the startup's juice packs could be squeezed by hand without using its high-tech machine.

By **Ellen Huet** and **Olivia Zaleski**

April 19, 2017, 2:00 AM MST

One of the most lavishly funded gadget startups in Silicon Valley last year was Juicero Inc. It makes a juice machine. The product was an unlikely pick for top technology investors, but they were drawn to the idea of an internet-connected device that transforms single-serving packets of chopped fruits and vegetables into a refreshing and healthy beverage.

Doug Evans, the company's founder, would compare himself with Steve Jobs in his pursuit of juicing perfection. He declared that his juice press wields four tons of force—"enough to lift two Teslas," he said. Google's venture capital arm and other backers poured about $120 million into the startup. Juicero sells the machine for $400, plus the cost of individual juice packs delivered weekly. Tech blogs have dubbed it a "Keurig for juice."

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But after the product hit the market, some investors were surprised to discover a much cheaper alternative: You can squeeze the Juicero bags with your bare hands. Two backers said the final device was bulkier than what was originally pitched and that they were puzzled to find that customers could achieve similar results without it. Bloomberg performed its own press test, pitting a Juicero machine against a reporter's grip. The experiment found that squeezing the bag yields nearly the same amount of juice just as quickly—and in some cases, faster—than using the device.

Human-Centered Design

“an approach that puts human needs, capabilities, and behavior first, then designs to accommodate those needs, capabilities, and ways of behaving.”

How do we do that in our design process?

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  - ~~**HCI and** **Human-Centered Design Process**~~

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Human-Centered Design Process

Inspiration:
Explore the problem space

Ideation:
Generate and Test Ideas

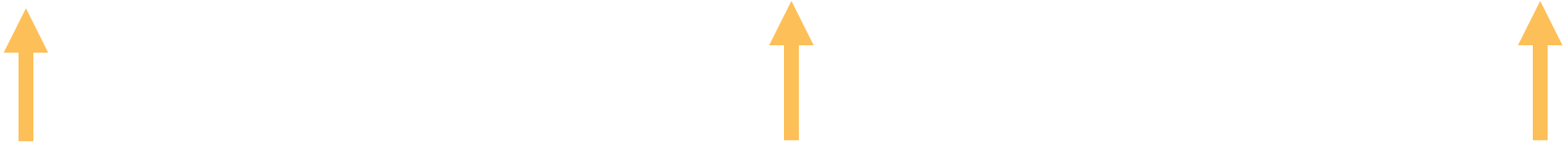
Implementations:
Learn and Iterate Solution

Human-Centered Design Process

Inspiration:
observation,
interviews, survey

Ideation:
participatory design,
personas, scenarios

Implementations:
evaluation



User **User** **User**

Human-Centered Design Process

Inspiration:
observation,
interviews, survey

Ideation:
participatory design,
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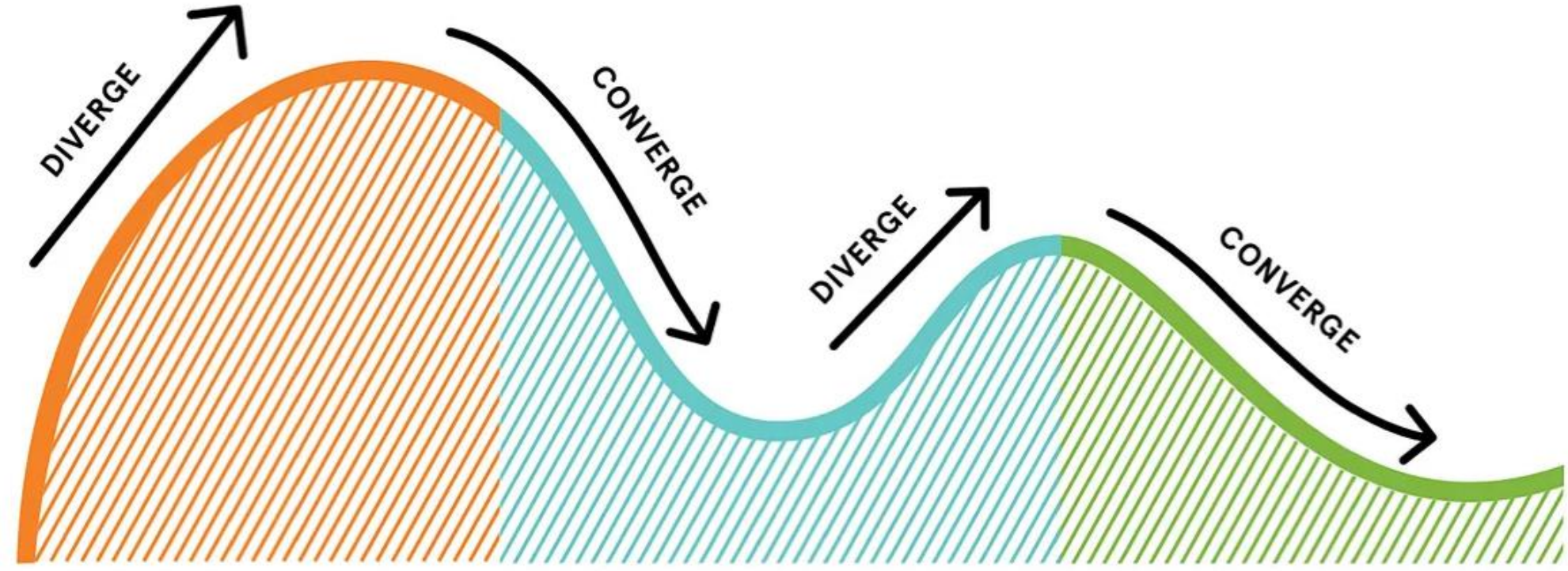
Implementations:
evaluation

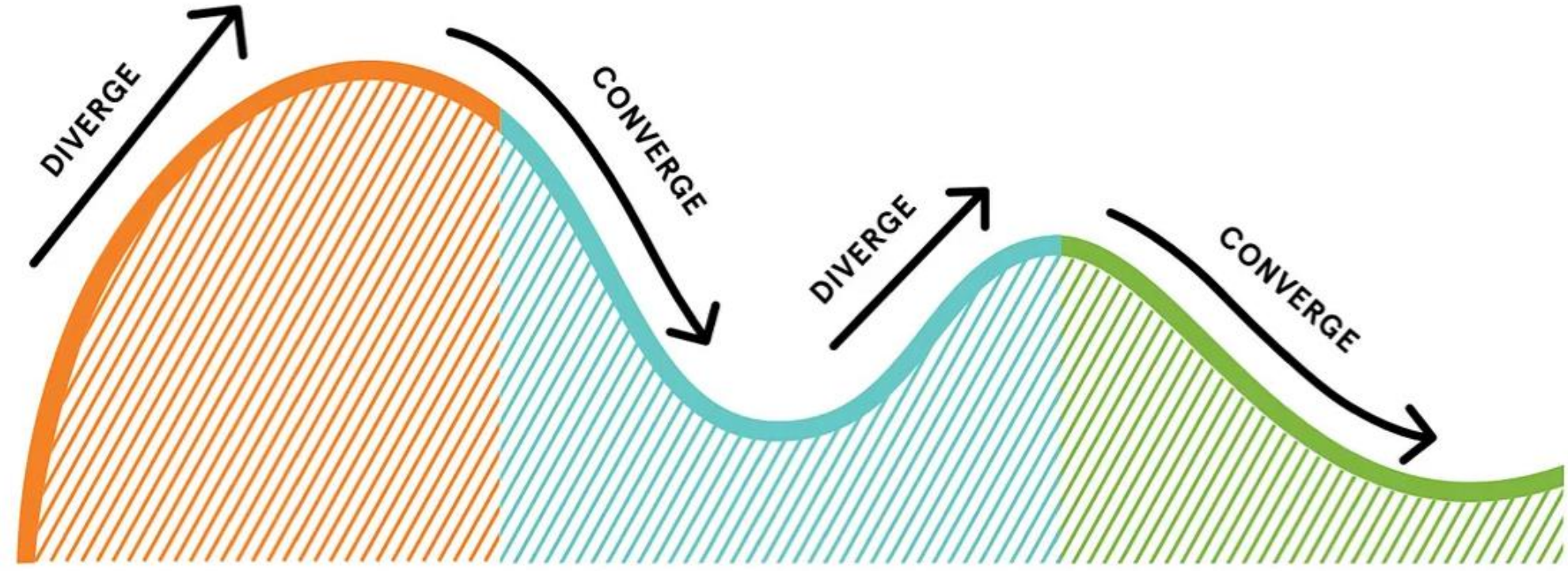


A Design Process in Cycle

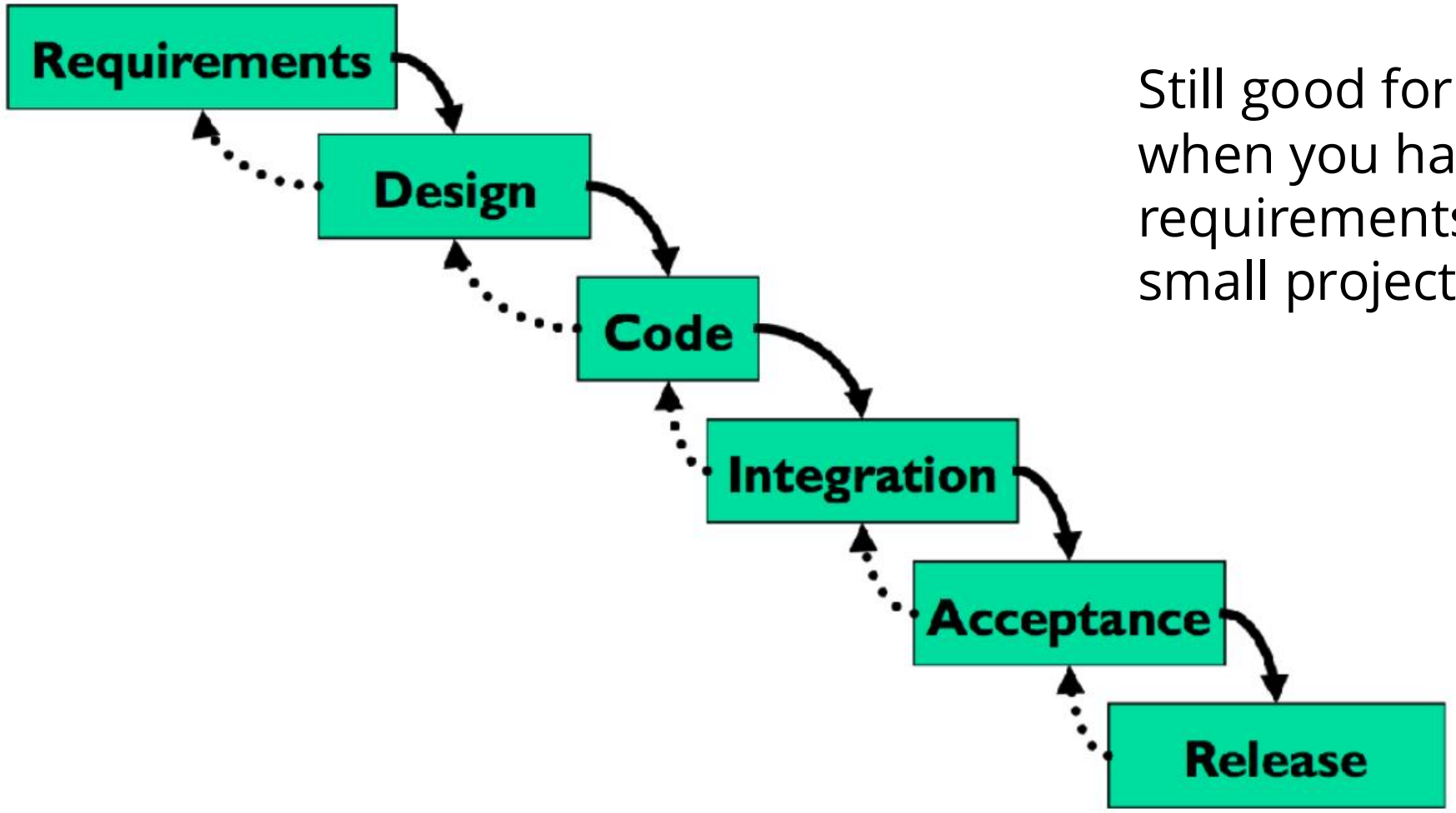
Inspiration:
Explore the problem space

Ideation:
Generate and Test Ideas

Implementations:
Learn and Iterate Solution

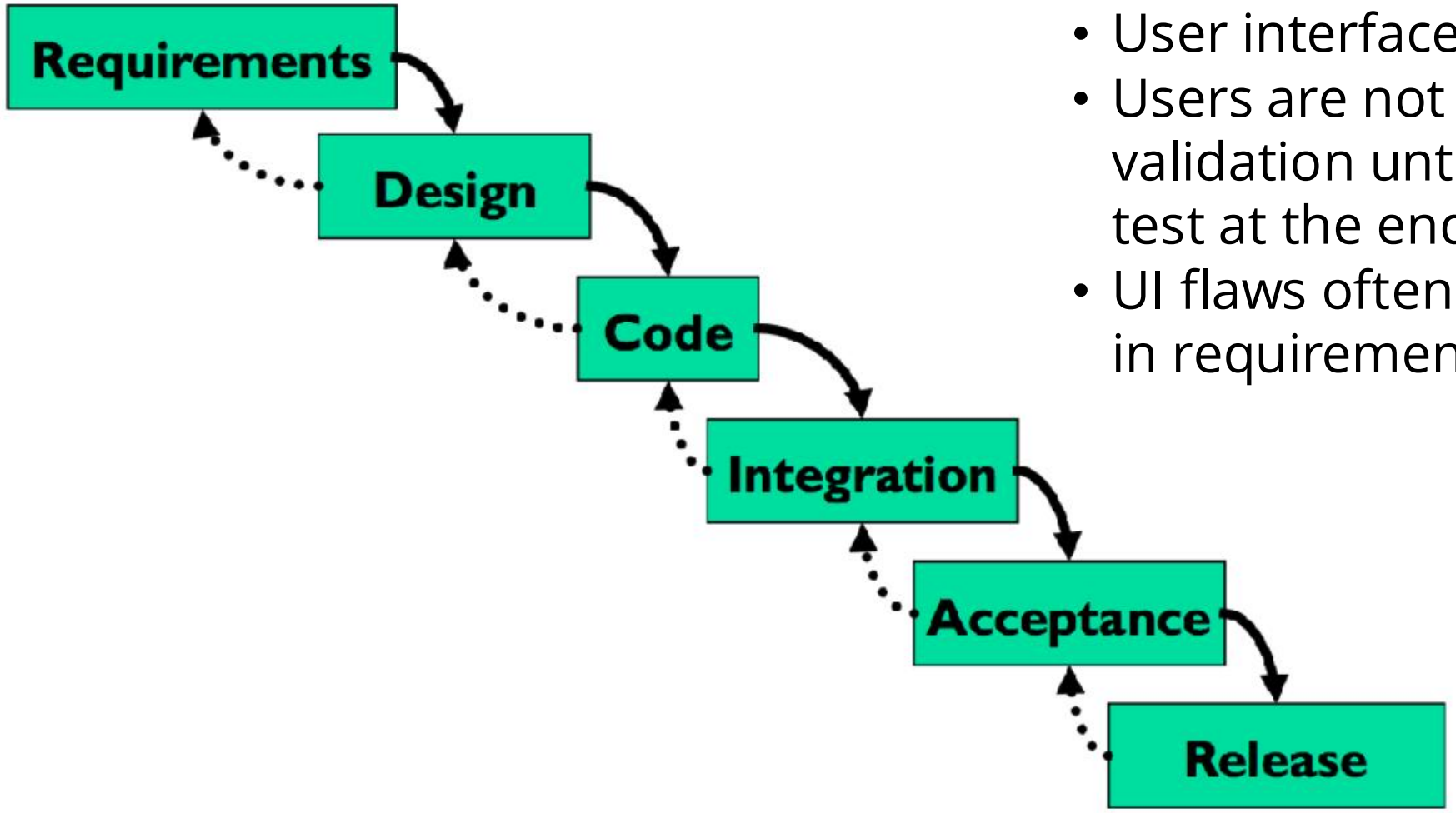


Linear Process: Waterfall Model



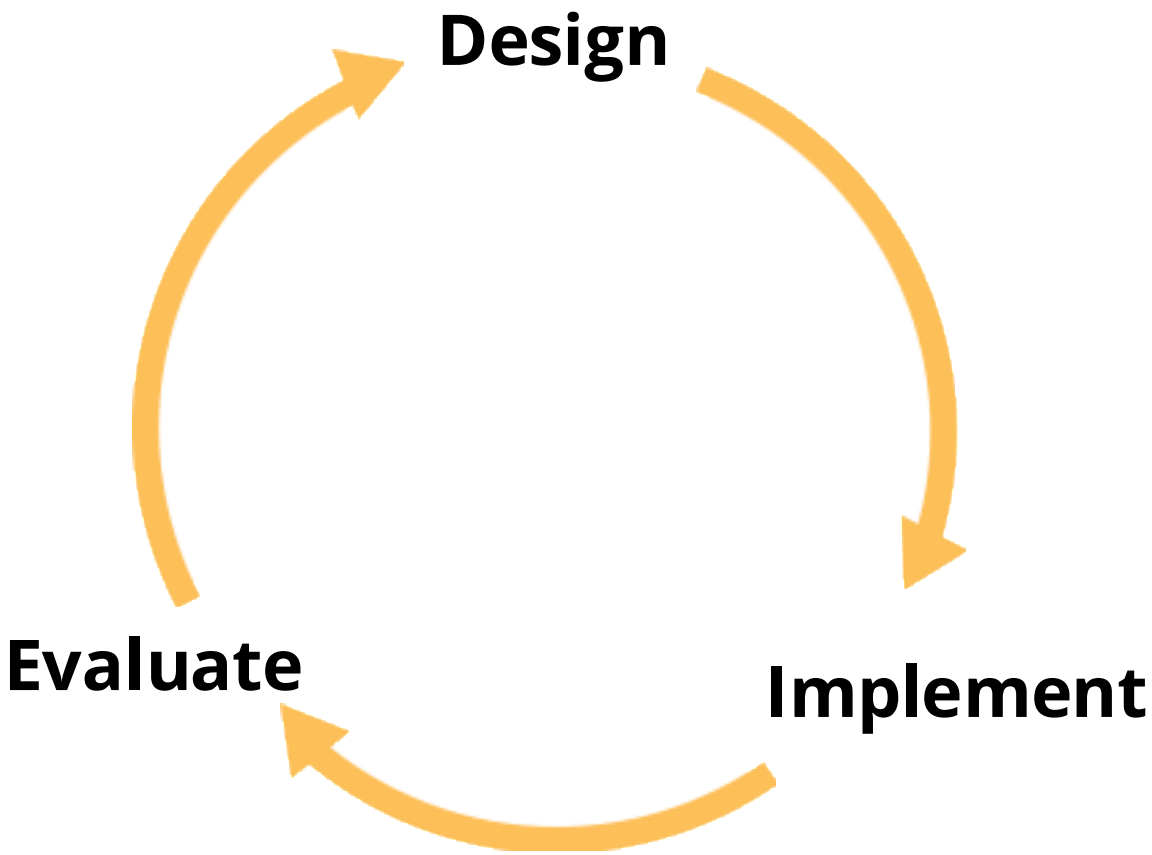
Still good for engineering when you have clear requirements, or have small project.

Linear Process: Waterfall Model



- User interface design is risky
- Users are not involved in validation until the acceptance test at the end
- UI flaws often cause changes in requirements and design

Iterative Process



- Doing design in cycles and iterations
- Potentially involve users in both the design and evaluation phases

slido

Please download and install the Slido app on all computers you use

How many iterations are needed to get a good design?

ⓘ Start presenting to display the poll results on this slide.

Quick Poll

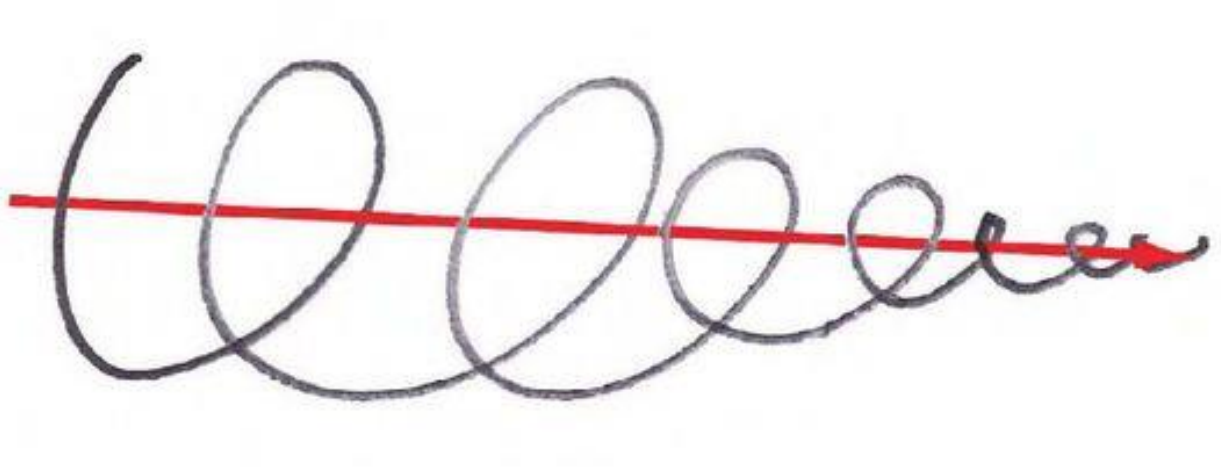
How many iterations are needed to get a good design?

A. One iteration
B. Two iterations
C. N iterations (N>2)
D. As many iterations as possible

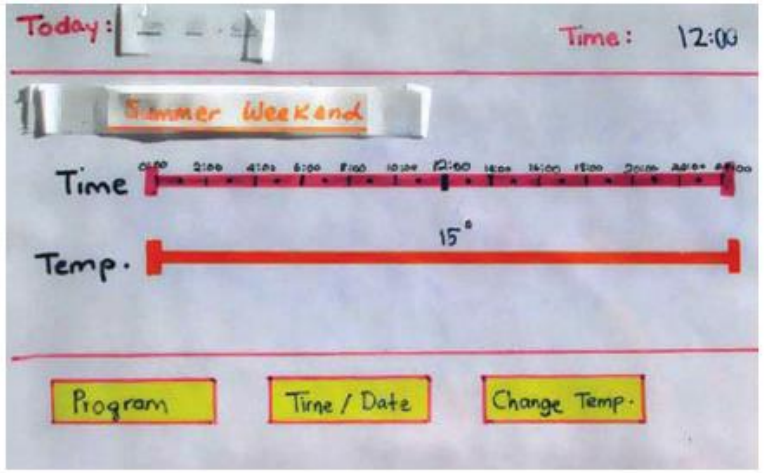
In a real-world scenario, there are always constraints about **budgets, timing**. We cannot iterate as many times as possible and we need to think about cost-effective ways when we iterate our design (**varying design fidelities**).

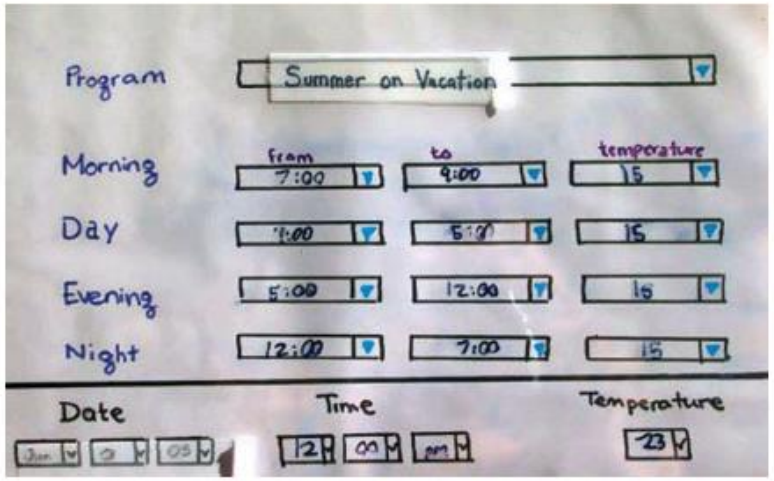
Iterative Process: Spiral Model

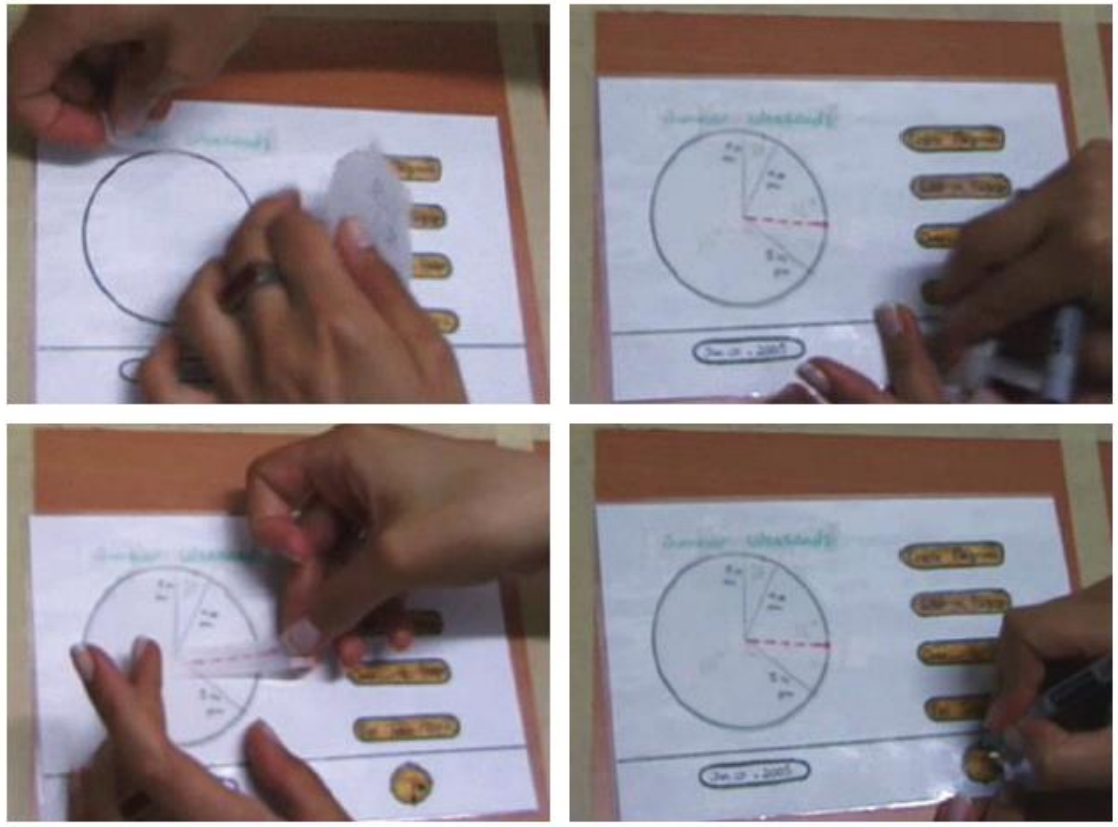
- As we going through different design iterations, we are **varying fidelities** as well.
- Often from **low to high** fidelities to quickly iterate at **a fairly low-cost** in early iterations.



Iterative Process: Early Prototyping







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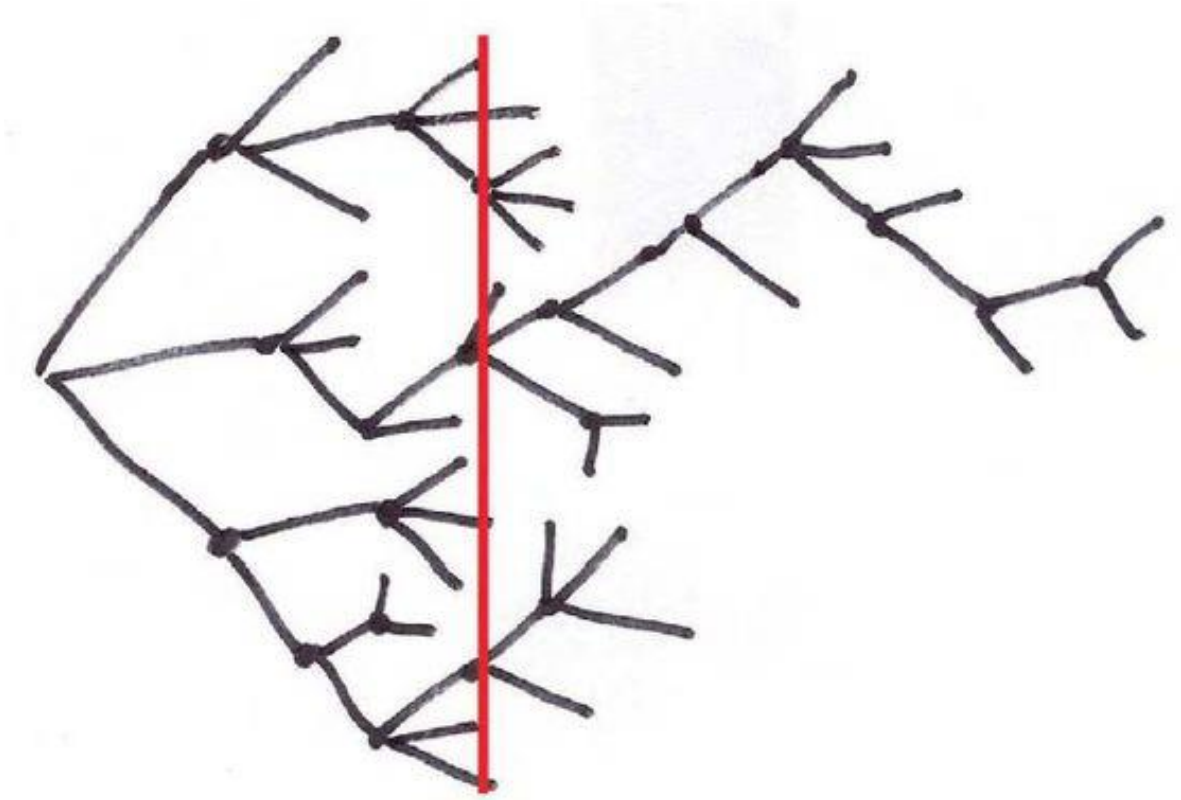
Parallel Design

- Build and test **multiple prototypes at the same time** to explore **design alternatives**
- Easy to do when sketching or making low-fidelity prototypes!



Benefits of Iterative Process

- Early iterations use cheap prototypes
- Later iterations use richer implementations **after risk has been mitigated**
- **More iterations generally mean better design**
- Only mature iterations are seen by the world

Practice
Evaluate – Design - Implement

Evaluate – Design - Implement

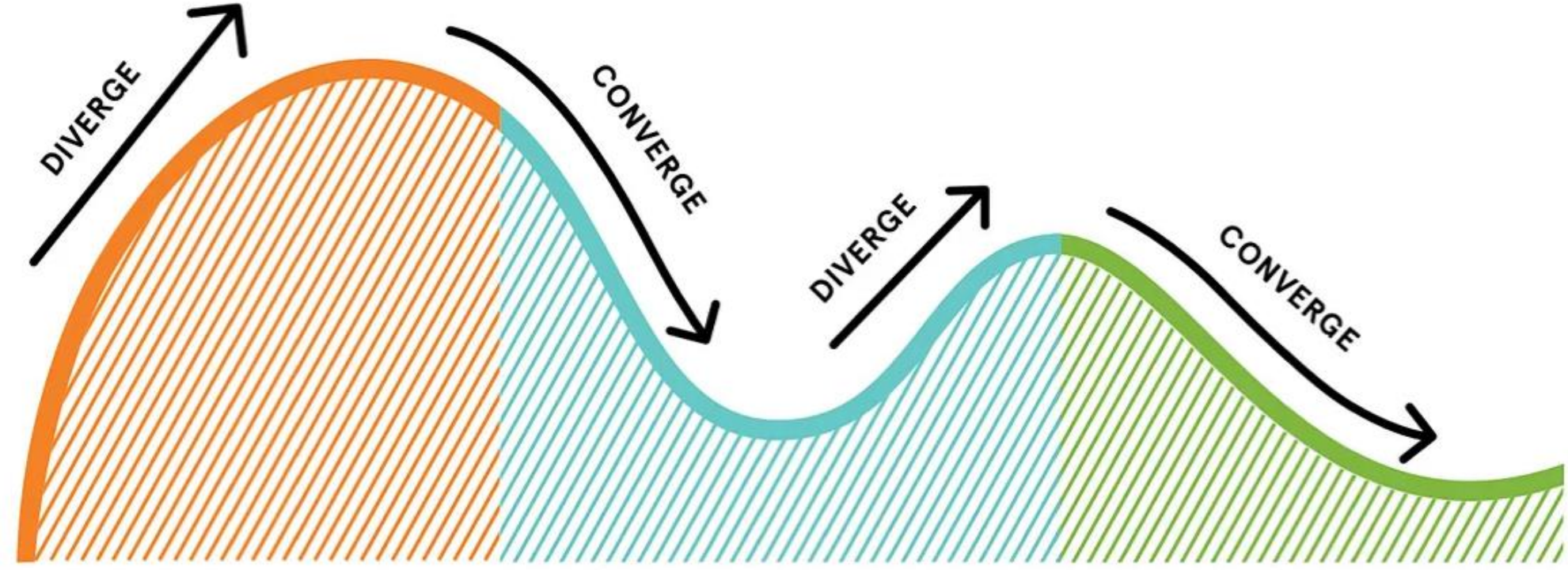
1. Take a quick look at these **three locks** and think about how **people interact** with them
2. Think back to **a time when/where you used a lock** and remember **problems** you may have encountered when trying to use it.
3. **What aspect of the design of the lock is related to the problem?**
4. **Design and then sketch** a new lock that addresses the problem.
5. Share your work with the person next to you or another group!

Applying HCD to Design Project

Design Project M2
Requirement Elicitations

Design Project M3
Task Analysis and Low-Fidelity Prototypes

Design Project M4
High-Fidelity Prototype & Project Report



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Week 2 Goals

- **Monday**
  - Interface and Interaction
- **Wednesday**
  - Usability and UX
- **Friday**
  - Design Principles: Part 1