# Introduction to HCI
# Fall 2021

# HCI Design Process

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# Logistics

- Assignment 1
- Project and team formation

# Assignment

- Questions or concerns?
- Assignment description - https://docs.google.com/document/d/13SAXrBy9Zrj4gRlThGdlM8G7-DA62CUKpCAGjQk_CCY/edit?usp=sharing
- Submit 1 PDF file in Gradescope
- Gradescope access
- Others

# Project

- Be in 7-8 member teams
- Made up of 3 milestones

- Given a design brief:
  - Investigate status quo, come up with several possible solutions, and systematically choose the best
  - Iteratively prototype your solution, gradually increasing its detail and polish
  - Evaluate your solution

# Example projects and project ideas

- Some sample projects from last years
  - https://tinyurl.com/nu2dcpze
- Some project ideas
  - https://tinyurl.com/5ak7rxps

# Learning goals

- After this lecture, you should be able to:
  - Contrast the central principles of user-centered versus technology-centered design
  - Describe the stages of the HCI process and different types of goals each might have
    - Know the roadmap for deploying evaluation techniques in different stages
    - Identify important features of the process (e.g., iteration); LATER lectures will discuss more features
    - Define and identify stakeholders

# What is HCI?

A discipline that applies Human-Centered Design methods to the design of interactive technologies.

# Different attitudes toward design

Technology-centered

vs.

User-centered design

# Technology-centered design

- Natural to design for all kinds of reasons …
- Technology-centered design
  - Design decisions are guided by technology
- Prevalent attitude in real world because . . .
  - Technology is fun!
  - Making novel things is engaging – for the designer
  - If it seems like it should work well – or looks cool – people often buy it, too.

# Technology-centered design

- Technology-(or curiosity-driven) design:
  - Can be the basis of radical innovation that eventually will change peoples' lives.
  - Not necessarily a bad thing.
- The problem?
  - Risk of leaving out real people, who have real problems right now.

# Try: googling “wearable phone”

- Cool!
- But - what would it actually be like to use these?

# Segway:

What is it for?

06-23-20

# Exclusive: Segway, the most hyped invention since the Macintosh, ends production

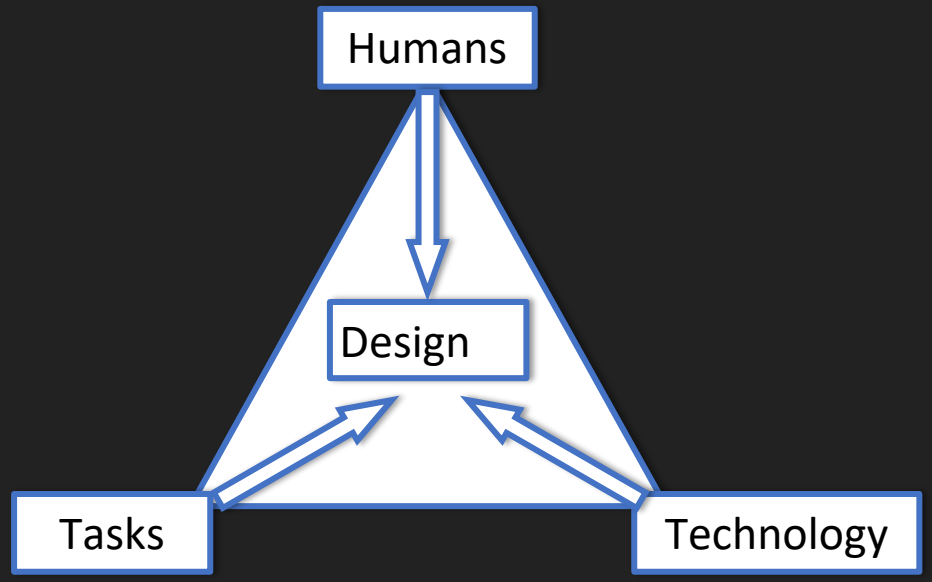
The Segway brand will no longer make its two-wheeled, self-balancing namesake.

[Photo: David LeFranc/Gamma-Rapho/Getty Images]

https://www.fastcompany.com/90517971/exclusive-segway-the-most-hyped-invention-since-the-macintosh-to-end-production

# Attitude of user-centered design

Incorporate users into the design process

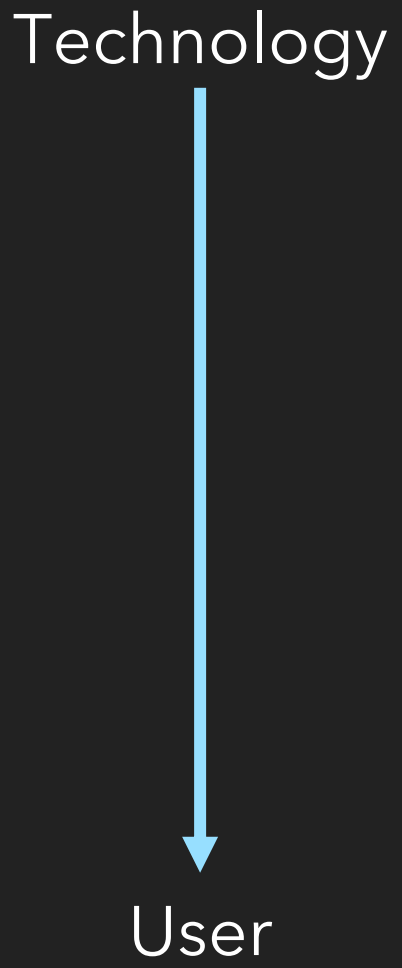


# Observe, test, iterate, and learn

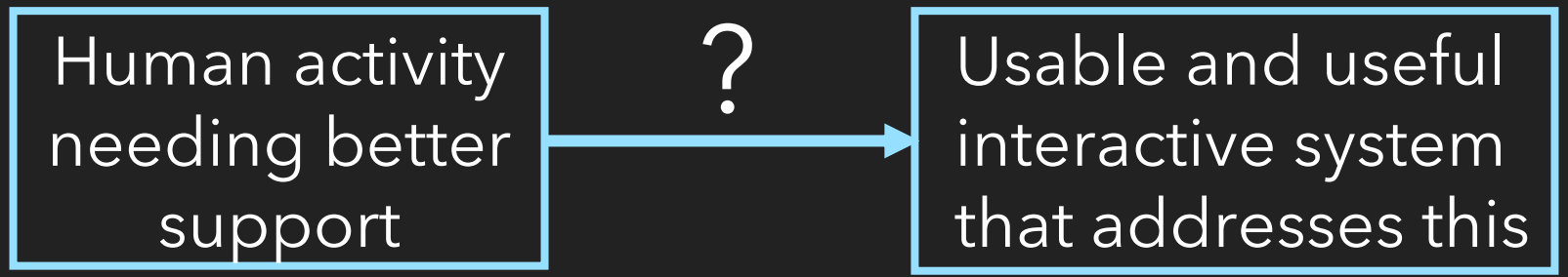

https://www.nngroup.com/videos/observe-test-iterate-and-learn-don-norman/

# Spectrum of attitudes towards design

- Attitude of technology–centered design
  - Progress made by technological advances
  - Goal is to show off gadgets and inventions
- Attitude of designer-centered design
  - Progress made by considering designers' intuition
  - Imagining what the user will do and feel
- Attitude of user-centered design
  - Incorporating the users into the design process
  - Empirical studies integrated early into the design
  - Users as part of the development team



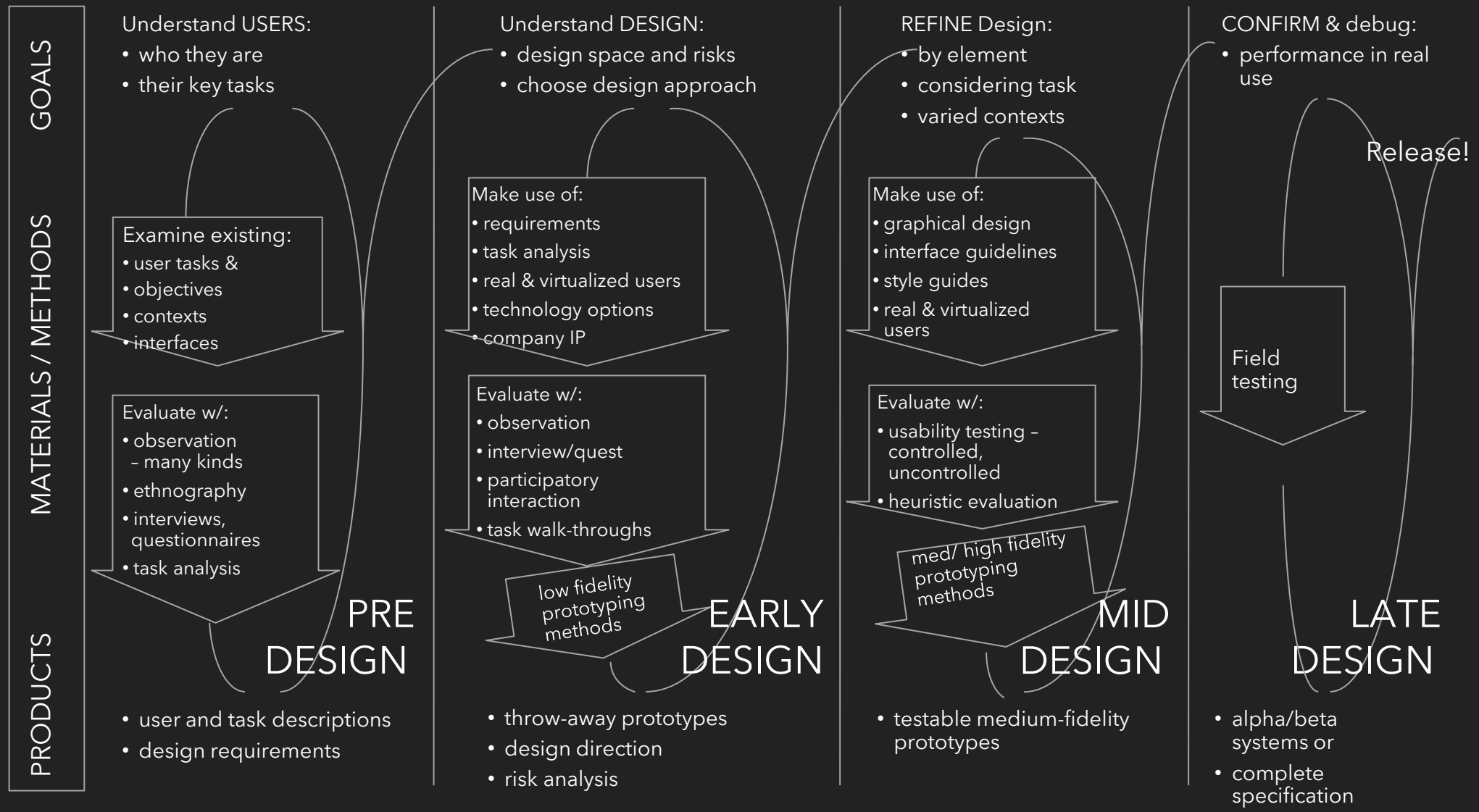
# HCI Design Process - Why do we need a process?




How do you get from problem to solution?

A map would help.

# User Interface Design Process: Evolving Iterations

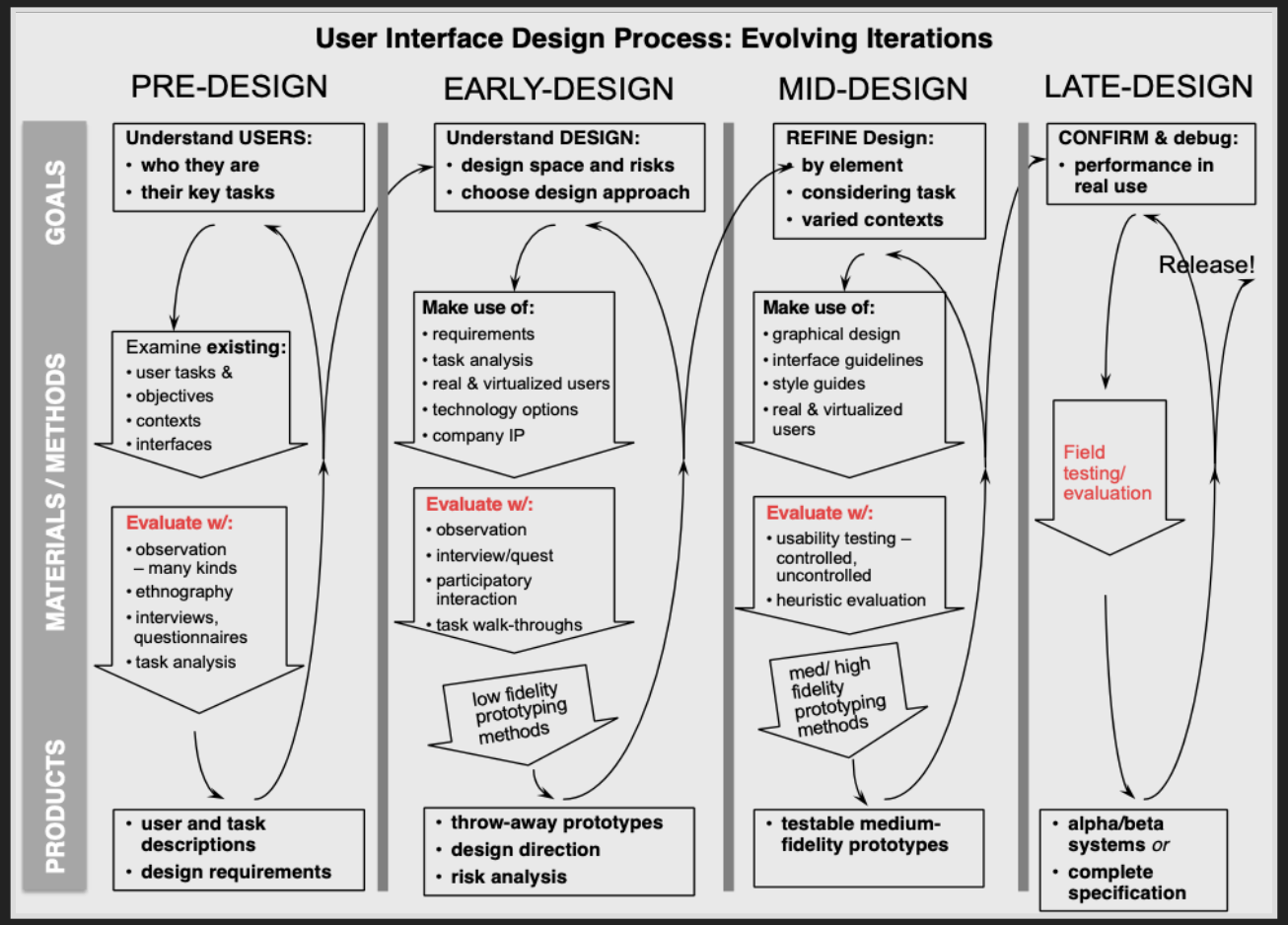



*K MacLean - derived from version by Saul Greenberg (U Calgary)*

# Process stages and their goals

- Pre-design: Understand the problem
- Early design: Explore design space
- Mid design: Develop the chosen approach
- Late design: Integrate and start to deploy
- Always: Evaluate and prototype

# Key Features




- Stage evolution:
  in goals, methods, products
- Iteration:
  both within and between stages
- Methods:
  used throughout, or stage-specific

# Some techniques are ubiquitous…

- Interviews, observation, questionnaires:
- Valuable throughout design process
- BUT – they may be executed differently
- Early: for understanding
- Later: for input on your design approach & details
- What's the difference? what's the same?

# Bowing to reality

- What makes it hard to follow the “ideal” process?
  - Deadlines
  - Budget
  - Access to appropriate users
  - Involvement late in design cycle
  - Valuation of HCI input by other parts of the organization
- What do you do then?

# Who are the stakeholders?

- Stakeholder = anyone who has some reason to care about the interface
  - Can be lots of them!
  - Needs may conflict
    - A user: convenience, functionality, …
    - Boss: price, worker efficiency
    - Developer: ease of development - deadlines, budget
    - Manufacturer: cost of production
    - Advertiser: visibility
    - … more

# How to figure out who your stakeholders are:

- Who will ask for it?
- Who will use it?
- Who will decide whether to use it
  (or if someone else will use it?)
- Who will pay for it?
- Who has to make (design / build) it ?
- Who has to make a profit from it?
- Who will otherwise make your life miserable if they don't like it?
- ???

# In-class activity

- Break out in groups
- Discuss project ideas

# Additional Information

# Pre design questions

- Understand the problem
  - Problem = “human activity needing support”
  - Do users really have the problem you think they do? is it an important problem for them?
  - Who are the users? who cares? what non-users are involved in the problem and its potential solution?
  - What are your users like? how varied are they? expertise, abilities, priorities, special needs, constraints, ….
  - What is the task? what are they really trying to do, and what is getting in the way?
  - What properties must a solution have?

# Early design questions

- Explore design space
  - Have you considered all relevant approaches?
  - What are the 'metrics' that you should be considering as you compare approaches? feasibility, price, complexity, functionality, fit to company focus/intellectual property, …
  - What are the high-risk elements of your likely approach, and can you address them?
  - At this stage - don't invest effort or love. Be quick, dirty, no attachment.

- CHOSEN DESIGN APPROACH

# Mid design questions

- Develop / confirm chosen approach; reduce risk
  - Are there major “elements” of your design that can be advanced separately? e.g. layout and flow, look-and-feel, technical interface implementation
  - What are the major questions / uncertainties / risks associated with each design element? focus on these. minimize time on problems you know you can solve.
  - What user input will you need to verify your design progress? When, where; how much will it cost and can you afford it?
  - What prototypes do you need to support problem solving, Including getting user input on your design?
- DESIGN ELEMENTS CONFIRMED & MOCKED-UP

# Late design questions

Integrate and field-test

There shouldn’t be a lot of questions at this stage if you did the earlier stages right.

- Integrate the different design elements
- Final delivery platform
- Put systems in real users’ hands in real contexts for longer durations
- Fine-tune, debug

- RELEASEABLE SYSTEM!

# Role of evaluation in stages

- Why does every stage has an evaluation component?
- Because we must connect our design progress to user's task needs and contexts
  - Many ways of doing this.
  - Know your tools and choose effectively
  - Evaluation techniques: tools in a toolkit
  - Each tool has strengths/weaknesses, and a cost to use

# Roadmap to evaluation types

## Pre-design

ethnography

observation

interviews,
focus groups

questionnaires,surveys

## Early design

interviews,
focus groups,
observation

questionnaires,
surveys

contextual inquiry &
work modeling task analysis,
task / cognitive walkthroughs

participatory design

heuristic evaluation

## Mid-late design

observation,
interviews,
questionnaires,
surveys
using advanced prototypes

heuristic evaluation

formal performance / usability testing

Evaluation material (prototype) evolves

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# Optional Reading

- Chapter 6, Design of Everyday Things – Don Norman
  - Design Thinking
  - https://drive.google.com/file/d/1L3C3sBQk-EW-PRPjJ7iM2ehlfdgMMbpm/view?usp=sharing