Interaction Design

School of Computer and Communication Sciences

EPFL

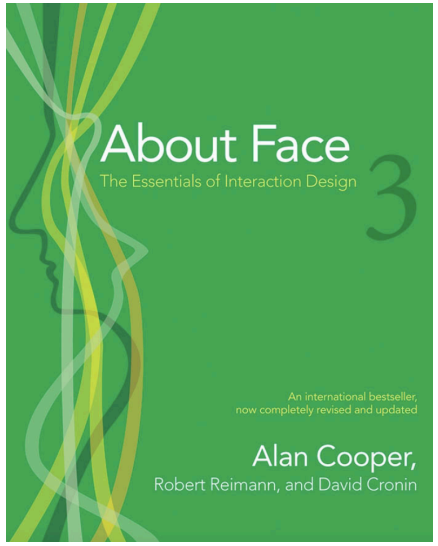
Pearl Pu

ADMINISTRATIVE DETAILS

- **Course Title: CS 486**
- **Number of credits: 4**
- **Time allocated: 120 hours**
- **Lecture Time:** Monday 8:15h – 10h (BC 01)
  - **Exercise Hour (TP):** Mon 10:15h – 11h (BC 01, 07)
- **Project Hour**: Mon 11:15-12h (BC 01, 07)
- **Format of Control:** continuous
- ***Textbooks:***
  - ***Required*** : About Face 3 by Alan Cooper et al.
  - 100 Things Every Designer Needs to Know About People by Susan Weinschenk (Kindle edition and e-book)

Conceptual Knowledge

- Two major sources
  - Cooper book
  - Lecture notes in slides



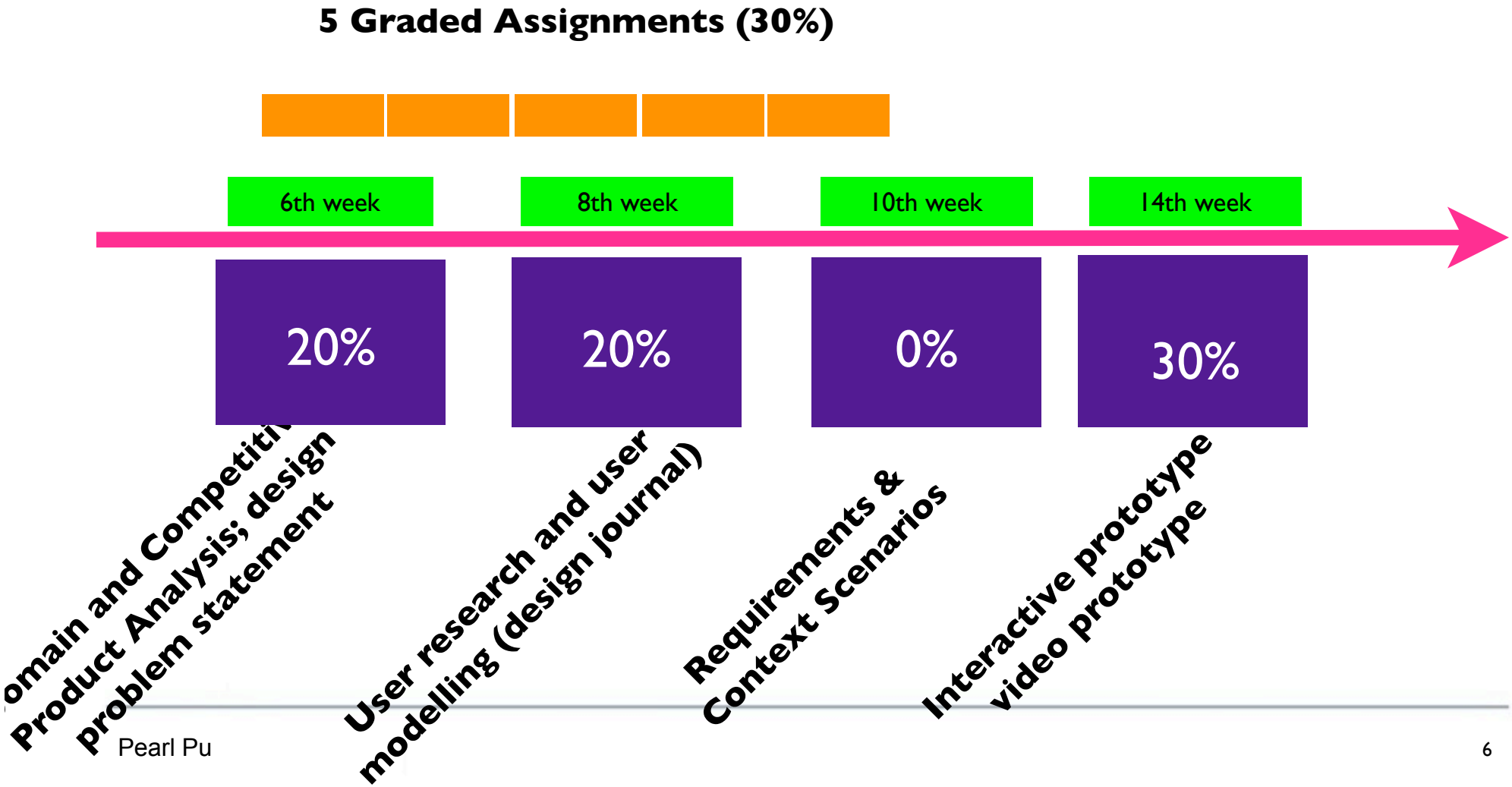
PRACTICES

- 5 Graded assignments (30% of grade)
  - 3 will be actually graded
- Capstone project in two phases (50% of grade)
  - group performance (group of three students)
- Design journal (20% of grade)
  - user research
  - individual performance

TEACHING STYLE

- Before the lectures on Monday
  - Reading material for each week is assigned (see Moodle page)
  - Students complete readings at home before Monday's lecture time
- Classroom teaching (Monday 8:15h -10h)
  - Additional slides to review the material and to give more in-depth explanations
  - Focus on practical aspects
- Exercises (Monday 10:15h-11h)
  - Graded assignments
- Project hour (Monday 11:15h - 12noon)
  - Sessions dedicated to the project

PLANNING


5 Graded Assignments (30%)
6th week
8th week
10th week
14th week
20%
20%
0%
30%
omain and Competiti
Product Analysis; design
problem statement
User research and user
modelling (design journal)
Requirements &
Context Scenarios
Interactive prototype
video prototype

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HUMAN COMPUTER INTERACTION?

Outline of this slide deck

1. Cooper book: history, what, how
2. Lecture notes: why HCI
3. Design aims
4. Recapitulation

Cooper Book

Forward: The Postindustrial World

Introduction

Chapter 1: Goal-Directed Design

HCI IS A RESPONSE TO A BIG CHANGE

- Industrial Age vs. Information Age
  - assembly workers vs. information architects and programmers
  - transport goods vs. transport bits
  - construct software once and use it many times
  - no need to reduce the cost of software construction; optimize it
- Users in industrial age vs. in information age
  - users interact with software much more often and in more ways (how you operate a car, a microwave in the old days vs. nowadays)
  - you buy a car today -> you are really buying a navigation system
- HCI emerged as a topic due to the pervasive impact of information technology on users and our society

Making most desirable software is the main goal, rather than saving manufacturing cost

COMPANIES STRUGGLE WITH SOFTWARE

- Some executives are still thinking using industrial age mind set - optimizing manufacturing
- New Way: adopt **interaction design** as the primary tool for designing and managing software construction

Interaction design determines what behaviour will succeed

A BRIEF HISTORY OF INTERACTION DESIGN

- IxD design follows the history of personal computers
  - Xerox Parc
  - Apple Computer
  - WYSIWYG interface (what you see is what you get)
- The emergence of the Web made IxD popular overnight
- End users want technology to provide a compelling and effective user experience

Design has been ignored until recently

- Mechanical devices have a dozen of visible states; they are carefully designed for ease of use
- A piece of software can easily have 1 mio lines of code, and be in one of thousands of states, their interaction behavior often has been poorly designed

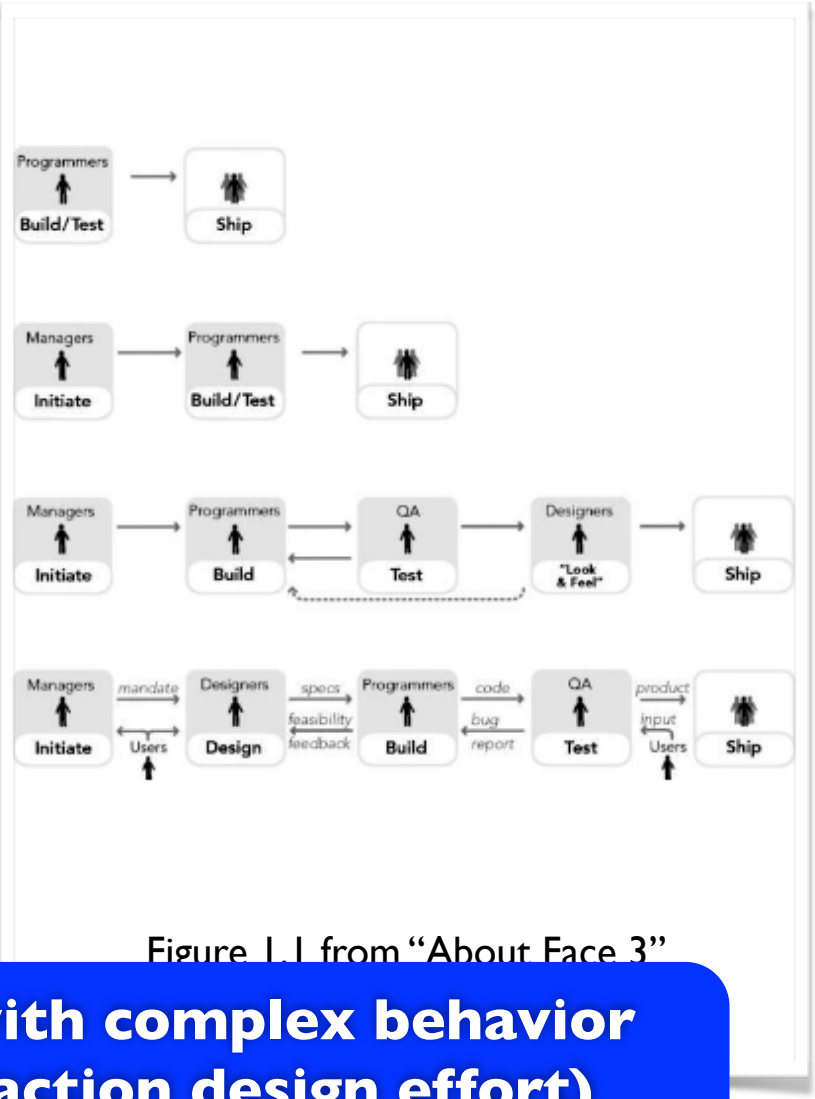


Figure 1.1 from "About Face 3"

The emergence of software with complex behavior requires design effort (interaction design effort)

4 GREAT ARGUMENTS

- Digital products
  - are rude
  - require people to think like computers
  - exhibit poor behavior (10 year old)
  - Require humans to do the heavy lifting

WHY SO BAD?

- Ignorance about users
- Conflicting interests - ease of coding vs ease of use
- Lack of process

NEED A NEW METHOD

- Repeatable
- Predictable
- Analytical

- To transform an understanding of users into products that both meet their needs and excite their imaginations

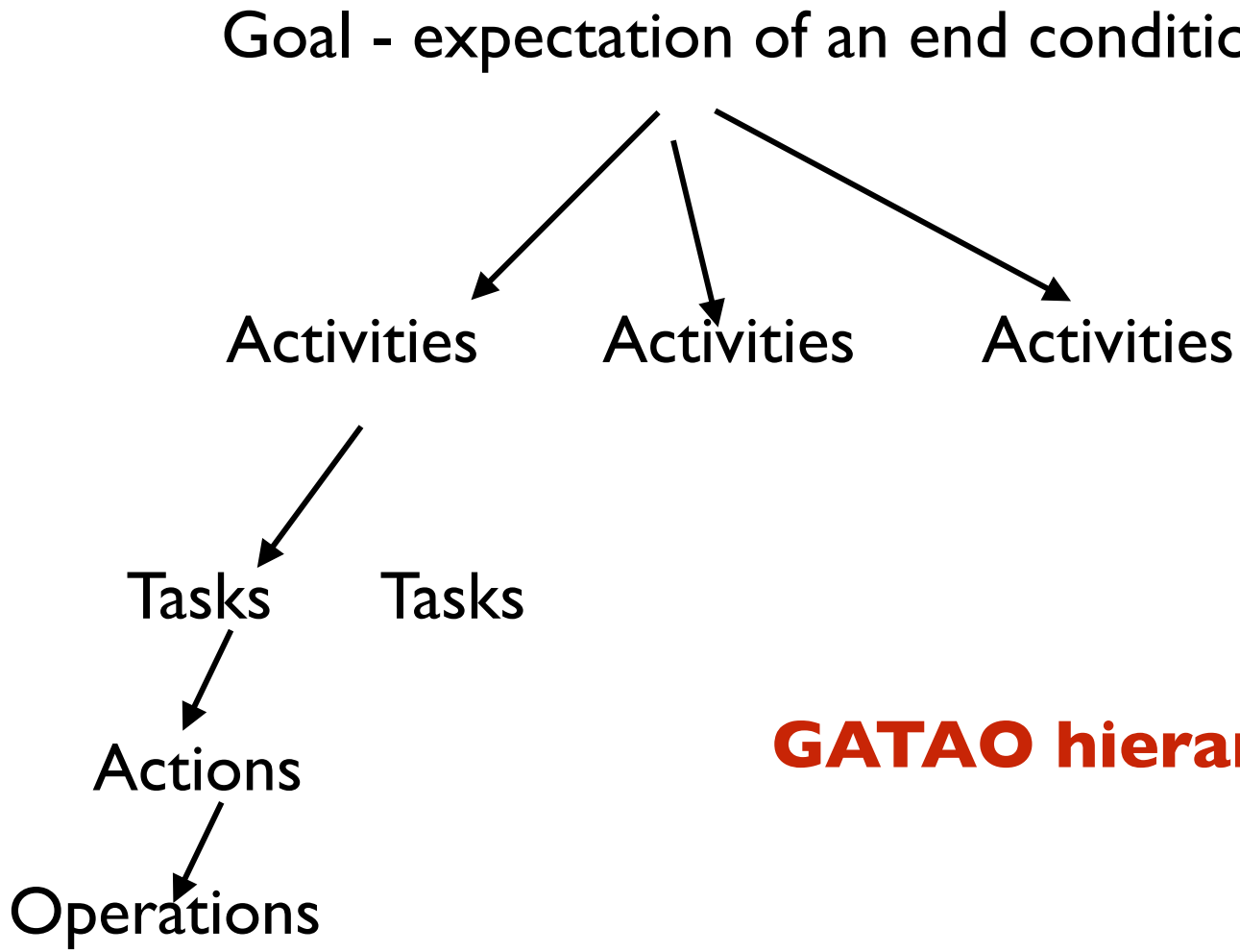
- Furthermore, it's a design method

Design method: goal-directed method

- Goal-directed method comprises of qualitative research, user modeling, requirentment analysis, prototyping, and evaluation
- Design principles to optimize design process
- Cognitive and behavior psychology theories to help understand users' goals, motivations, and limitations

Goal-directed Design Method (GDD)

What is a goal?



GATAO hierarchy

WHY FOCUSING ON GOALS?

- Goals motivate people to perform activities
- Understanding goals allow you to understand the expectations and aspirations of your users
- This understanding translates to deciding which activities are truly relevant to your design

Goal-directed design process (GDD)

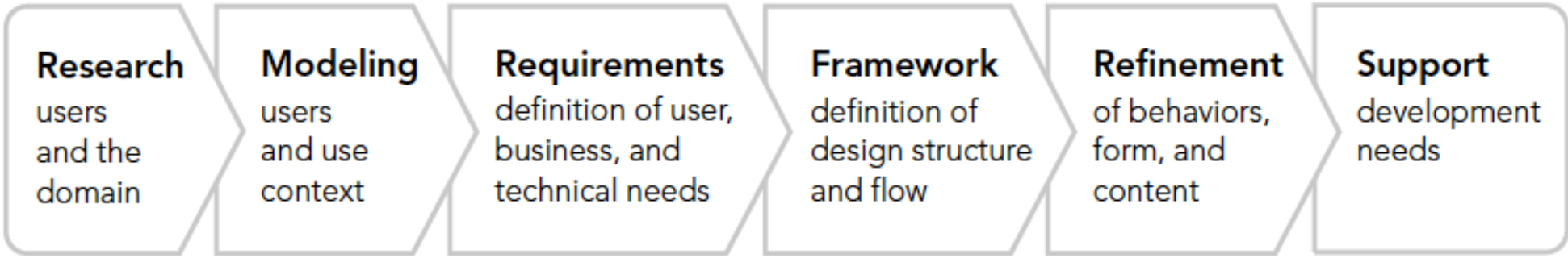


Figure 1-5 The Goal-Directed Design process.

Lecture notes - Why HCI

DEFINITIONS

Human computer interaction is concerned with the ***Design***, ***Implementation*** and ***Evaluation*** of digital products, environments, systems, and services for the purpose of offering compelling user experience

What are we designing?

- Three main entities
  - Behavior (interaction)
  - Form (interface)
  - Content (information)

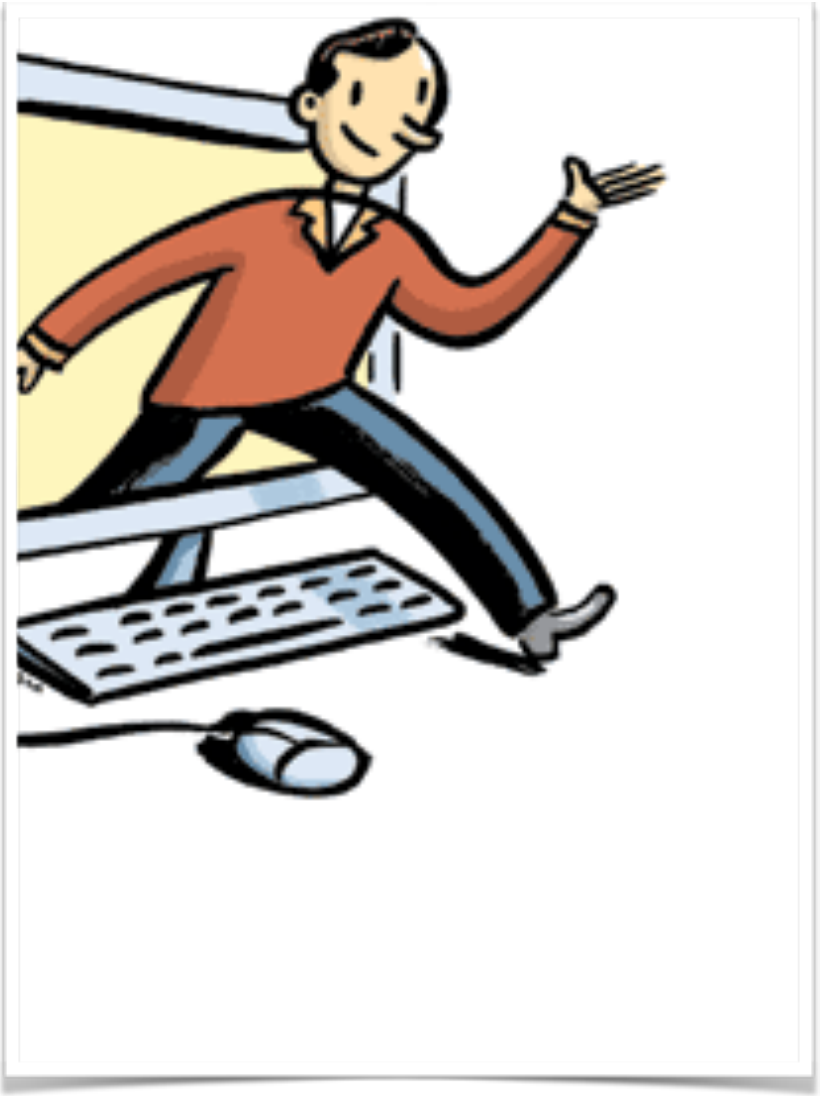
- When a true design succeeds, user experience dominates while behavior, form, and content may even disappear (less is more)

Why study HCI?

Why HCI matters?

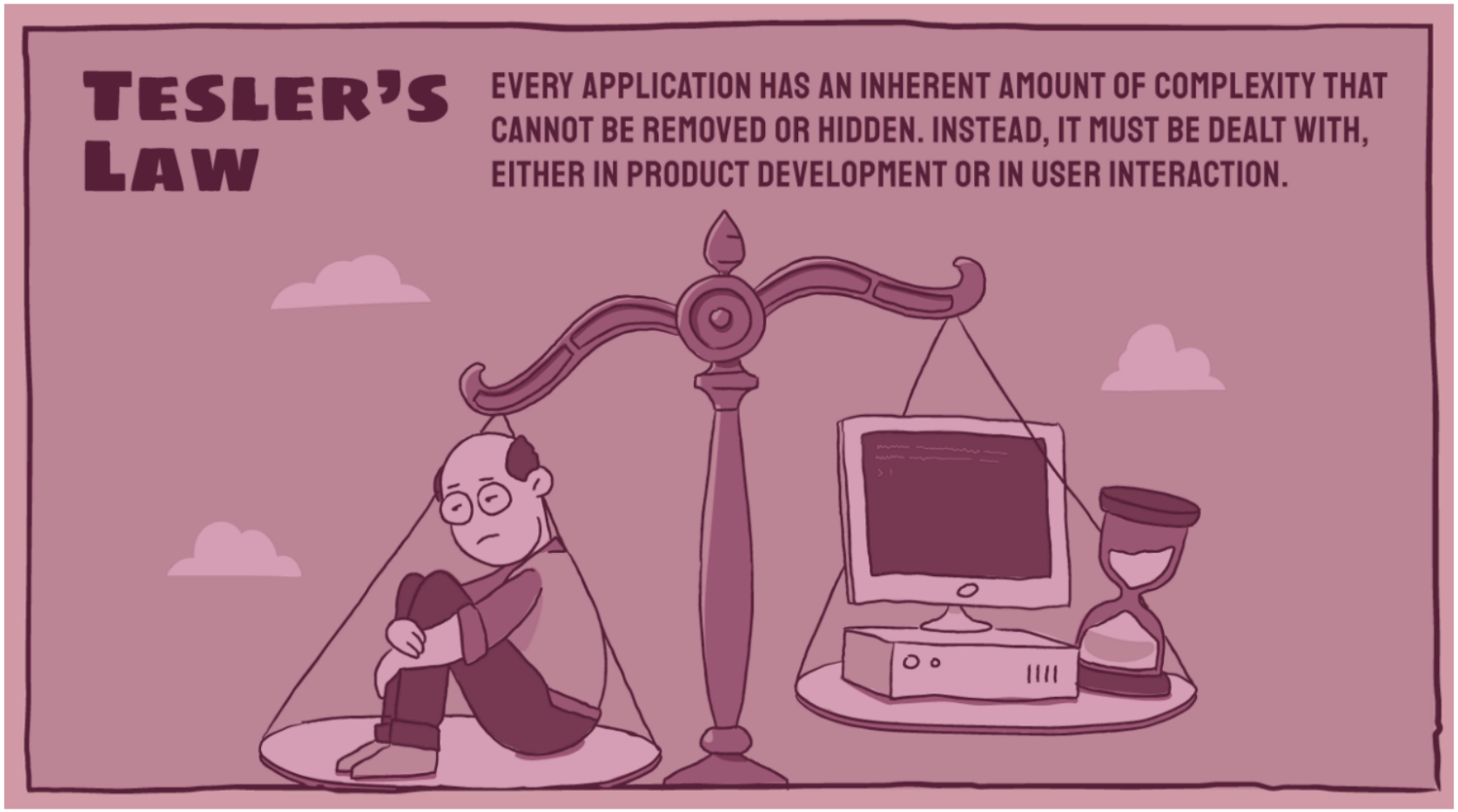
HCI IS HARD

- Design is hard
  - Who are users? what do they want?
  - What are their goals?
  - How do they do things? how to model them? how will they adapt to new software
- Lack of traditional methods (it's a young field)
- Inherit conflict: ease of coding vs. ease of use



Developers step out and examine IT products from users' point of view

Law of conservation of complexity



HCI IS A CAREER OPTION

- The second reason for studying HCI is that it is a viable career option. There are more and more jobs, such as user experience designers, product designers, that require skills and training provided by this course.

HCI IS A CAREER OPTION

- Apple: industrial design team, human interface design team
- Amazon: User experience researcher
- Google: UX team, qualitative user experience researcher
- Facebook: UX quantitative researcher
- Logitech: UX designer
- Swissquote: UI/UX product designer from product management team
- Frontend designer, frontend engineer, etc.

HCI SAVES MONEY

- ✓ **IBM**, along with several other companies, states that for every $1 invested in usability testing on software, the payback is between $10 and $100.
- ✓ The single largest predictor of call center volume is your web site's usability. Calls cost an average $22-$30 per call.
- ✓ For every dollar spent acquiring a customer, you will spend $100 dollars reacquiring them after they leave because of poor user experience.
- ✓ For every $10 spent defining and solving critical usability problems early in development using professional usability research, you will save about $100 in development costs.

CONCLUSION

- HCI is not guess work
- HCI requires professional training.

Misconceptions about HCI

- HCI is about GUI
  - but GUI is just one piece of the puzzle.
- HCI is about technology
  - but HCI is not limited to the confines of the computer; it doesn't even need a screen.
- HCI is about usability
  - while ease of use is important, HCI also promotes designing products to offer compelling user experience.
- HCI is just about Users
  - while HCI adopts a user-centric approach to design technology, users are also the bottleneck; users don't decide what's good, but designers do; designers have to integrate as many goals and needs as possible for the business and users.
  - Henry Ford said: "if i asked my consumers, they would have wanted a faster horse."

WHAT IS THE DIFFERENCE

- User Experience Design (UX), and Interaction Design (IxD) are often used interchangeably
- UX - behavior, content, form
- IxD - behavior
- How are IxD and UX related?
  - IxD addresses a subset of concerns of UX
- Our main focus is on both IxD (behavior) and UX (all three items)

Class Discussion "Inspiring Design"

- Find a partner
- Take turns to name a digital product whose interaction design has inspired you and discuss why
- As a team, discuss the important criteria of a successful interaction design
- Be prepared to present these criteria

What are the design aims?

What is a successful design?

What makes people want your products?

- Digital products must be useful
  - provide functions and features to help users perform his tasks
    - word processing
    - printing
    - online purchase
    - communication
    - online entertainment

Usefulness of a product is primordial

Useful but unusable object

Is usefulness alone enough?

No! design must consider ease of use

- What do we mean by ease of use?
  - Minimize learning time
  - Minimize interaction time
  - Minimize error rate

USEFUL AND EASY TO USE, BUT....

unattractive, even embarrassing

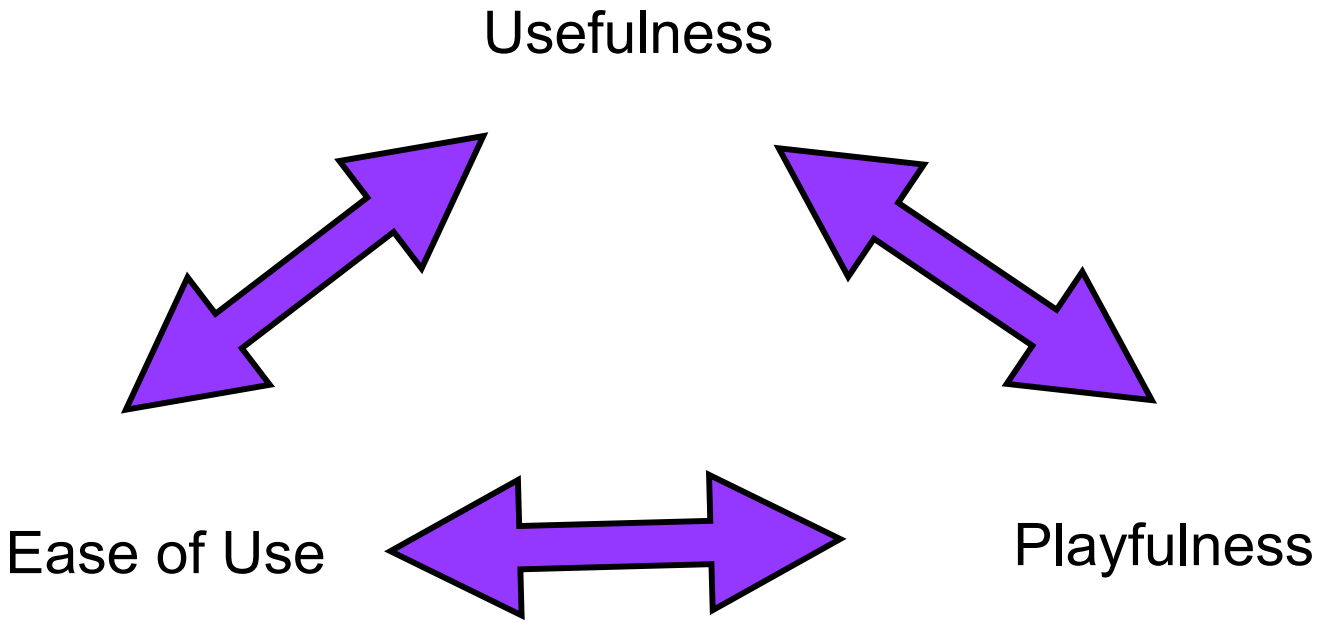
Which one do you prefer?

Usefulness and ease of use enough?

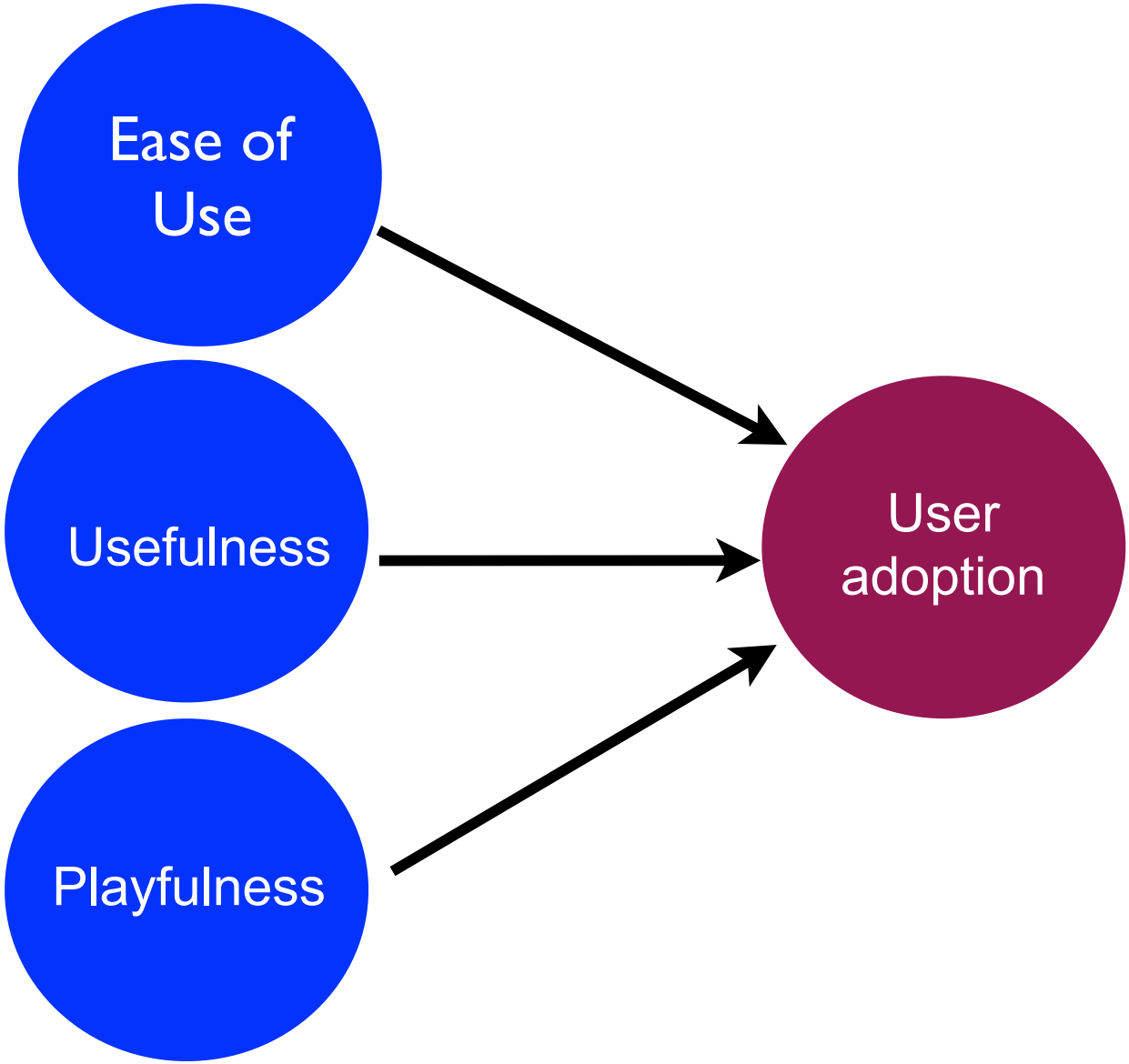
No! design must consider playfulness

- What do we mean by playfulness?
  - Do users forget the lapse of time?

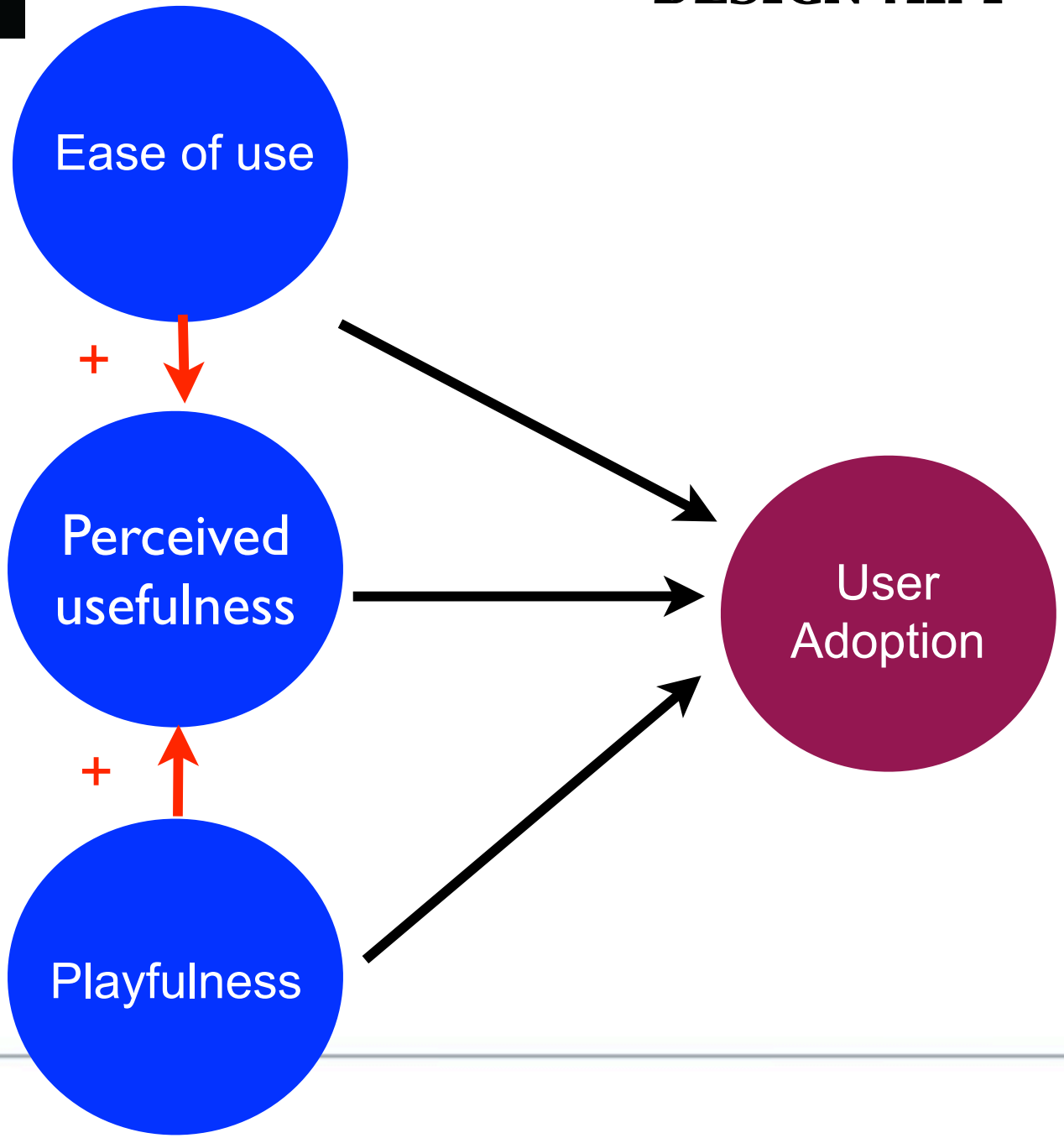
Success criteria for UX design



How these criteria relate?



Design aim – adoption



The relations of these three criteria

- The three criteria do not interact with each other equally
- Users perceive products that are easy to use more useful
- Users perceive products that are more playful more useful
- Users do not perceive more useful products (more features) easier to use
- Users do not perceive more useful products more playful

- ***Conclusion: ease of use and playfulness are amplifiers of adoption - they increase the likelihood of user adoption, giving the same usefulness***

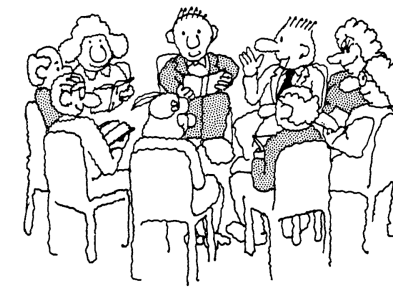
Goal-directed Design Process

- Most traditional methods don’t provide a means of translating research results into design solutions
- How does GDD bridge the gap?
  - Design as product definition - we will learn how to identify user requirements and define a detailed plan for the behavior and appearance of products
  - Design as researchers - we will learn how to find design drivers in domain research, user research

Between research and design

- Models
  - We will learn how to model users as personas
- Requirements
  - We will learn how to identify design requirements
- Frameworks
  - We will learn how to develop interaction frameworks

Class Discussion "Interview Users"



- Find another partner
- Together develop the GATAO hierarchy for the case where the user interacts with a ATM machine
- Her goal "take out 50 CHF from her bank account"
- You may replace the ATM machine by a bus ticket machine where the user goal is to buy a ticket from "Morges to Lausanne".

Recapitulation

Foundations of Design

- UX design uses theories and methods from many disciplines: design science, usability, and traditional sciences (cognitive and psychology) and engineering disciplines
- UX is more than the sum of its parts: user experience design is an extension beyond the traditional sciences

COURSE OBJECTIVE

- Design thinking vs. analytical thinking
- Goal-directed design process including users goals/ needs finding, prototyping, evaluation, re-design
- Design principles derived from psychology and cognitive science - mental models, how people learn, memorize, focus, perceive, etc.
- Via a hands-on project, learn to become an user experience designer

How does this course address your needs?

- I'd like to design cool and attractive software/ websites/games/gadgets, but i don't know how.
  - design thinking (training you to think differently)
  - give you a method (GDD in Cooper's book)
  - teach you design principles that work
- I see so many poorly designed software/websites/ games/gadgets. I don't know how to explain why the design didn't work.
  - critique poor design
  - suggest improvement
- I want to do a start-up; I need to develop user-facing software

What this course does not cover?

- How to use flash, proEngineer, or any other particular software package
- How to make an attractive webpage
- How to design an interface hardware
- How to program

THE END