

User Centered Design

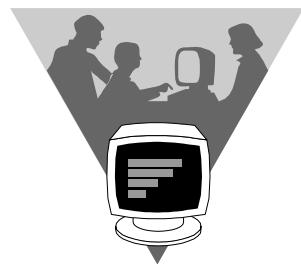
[1] Introduction

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Human-IST Institute, University of Fribourg
September 18th, 2018



System Centered Design

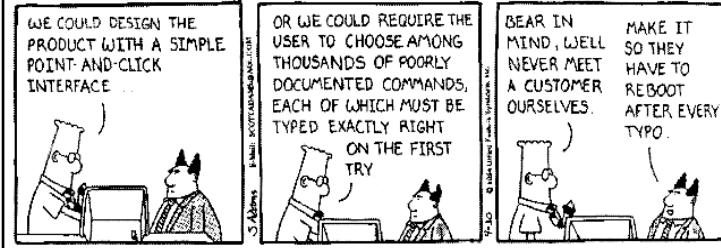
- What can I easily build on this platform?
- What can I create from the available tools?
- What do I as a programmer find interesting?



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System Centered Design



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User Centered System Design

- Design is based upon a user's
 - abilities and real needs
 - context
 - work
 - tasks
 - need for usable and useful products



Golden rule of interface design: **Know The User !**

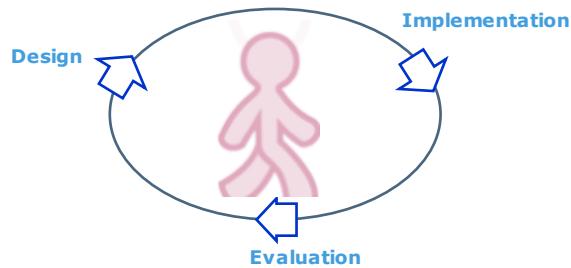


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User Centered Design

- A discipline concerned with the...



...of interactive computing systems for human use.



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Why UCD?

- Shift in computer use
 - Tasks
 - ✓ very specific work tasks -> general work and fun
 - more factors need to be considered for design
 - Users
 - ✓ expert trained users -> anyone
 - users now demand ease of use
 - new market is big and competitive
 - o so motivation is high to make products like and will keep using
 - Technologies
 - ✓ desktop -> mobile environment
- Need to
 - > understand how people use and react to technology
 - ✓ put user at the center



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Why UCD is Useful?

- A usable system will improve the company's
 - image
 - communication
 - productivity
- 63% of large software projects go over cost
 - > insufficient user/developer communication and understanding
- UCD is software engineering
 - > pay a little now, or pay a lot later!
 - > not considering users can lead to
 - ✓ incorrect requirements
 - ✓ untested solutions
 - ✓ unusable products



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Why should you care about UCD?

- Developer perspective
 - > gives a better picture of how the system should behave
 - > gives you a better understanding of the whole lifecycle of development
 - > gives you a better picture of how people will perceive your system
 - > gives you insight into how non-developers perceive and approach problems
- Business perspective
 - > your future employers care!
 - > saves need to redesign and redevelop, therefore saves time and money
 - > gets usable and likeable products on the market faster

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Who uses UCD

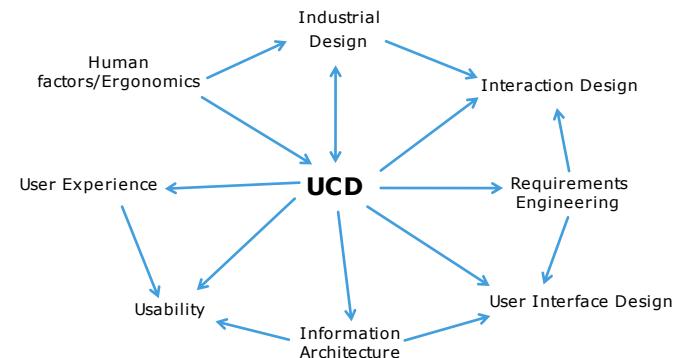
- Human Factors/Ergonomics
 - physical and cognitive properties/aspects of humans
- Industrial Design
 - design of physical components/devices
- Interaction Design
 - how to interact with the system
- Requirements Engineers
 - needs and task analysis
- User Interface (UI) Design
 - layout and look of graphical and physical elements
- Information Architecture
 - organization of content
- Usability
 - evaluation of how easy a system is to use and learn
- User Experience (UX) Design
 - psychological and sociological aspects



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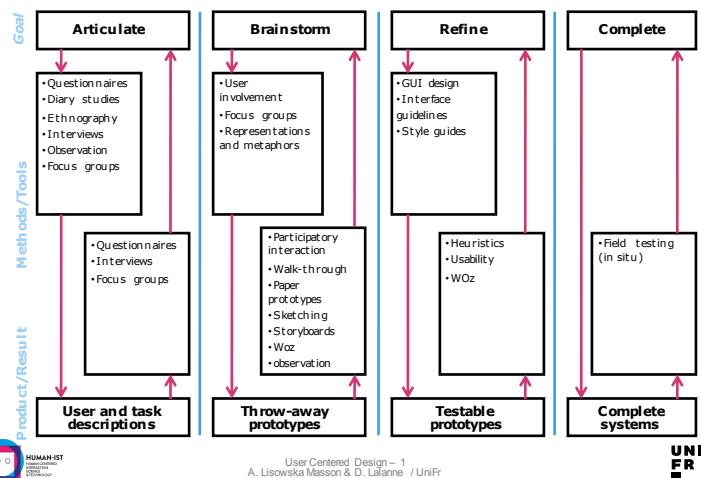
How UCD fits in



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UCD Design Process



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Objectives

- Understand
 - the development life-cycle of user interfaces
 - the principles of the various kinds of design and evaluation methods
 - when and how each specific design/evaluation method can be used
- Acquire theoretical and practical knowledge on the whole set of:
 - design and prototyping methods
 - evaluation methods
- Run user evaluations at any step of the usability engineering life-cycle.



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What and How

- Division theory/exercises:
 - ≈ 2h theoretical lesson
 - ≈ 30 minutes of exercises
 - ≈ 30 minutes for mini-project
- Theoretical lessons
 - slides and documents on <http://ilias.unibe.ch/>
 - key: "UCD2018"
- Exercises (if necessary)
 - during or after the theoretical lesson
 - practice new concepts learned



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Outline of class (1)

	Date	Prof	Topic
1	Sept 18 Start at 10h15	ALM & DL	Administrative Information Introduction to User-Centered Design - What it is, how it fits in, and why you should care about it.
2	Sept 25 Start at 9h15	ALM	Human Factors - An introduction to the aspects of human beings that are relevant to user-centered design (and human computer interaction in general) such as sensory-motor properties, information processing capabilities, emotions, and sociological and psychological influences.
3	Oct. 2 Start at 10h15	DL	Interface and Interaction Paradigms - An overview of the types of interfaces that exist today (examples include WIMP, voice, multimodal and tangible) as well as the interaction paradigms that are most commonly used in interfaces (for example direct manipulation, hypertext, windows, desktop, metaphors, CSCW, UbiComp...).
4	Oct. 9 Start at 9h15	ALM	Needs, requirements and choosing technologies - Introduction to the most common methods used when gathering user needs and requirements including focus groups, questionnaires, diary studies, ethnographic studies, interviews, and observation. How to go from a list of user needs and requirements and a list of available technologies and paradigms to descriptions of systems that can then be put into development. This will include how to analyze and prioritize needs, how to find matches between requirements and technologies, and how to create useful and comprehensive documents, such as scenarios, which can be used to guide the development process.

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Outline of class (2)

	Date	Prof	Topic
5	Oct. 16	DL	Early stage evaluation - Introduction to the types of methods that are most commonly used to evaluate prototypes at the early stages of development. These will include methods such as paper prototyping, sketching, storyboarding, WÖz evaluation, think aloud protocols and observation.
6	Oct. 23 Start at 9h15!	ALM	Prototyping - Introduction to the notion of prototyping as well as to various online and offline prototyping methods and tools.
7	Oct. 30 & DL		Project Session
8	Nov. 6 Start at 9h15!	ALM	Design guidelines, patterns and principles - Overview of existing design principles, guidelines and patterns and how they can be used (and misused).
9	Nov. 13 & DL		Intermediate project presentations



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Outline of class (3)

	Date	Prof	Topic
9	Nov. 20	DL	Hi-fidelity prototyping and late stage evaluation - Introduction to the types of methods commonly used for prototyping and evaluation at the later stages of development, including how to plan and run an evaluation, and how to analyze the resulting data.
10	Nov. 27 & DL		Project Session
11	Dec. 4 Start at 9h15!	ALM	Accessibility and Universal Design - An introduction to issues related to universal design and in particular design for user groups such as children, the elderly and those with disabilities, as well as notions of cross-cultural design.
12	Dec. 11 Start at 9h15!	ALM	Advanced topics and Wrap-up - Discussion of more advanced topics related to UCD such as aesthetics, adoption, and longitudinal studies. But also how to evaluate ubiquitous systems, multimodal interfaces, etc. - Time to ask any outstanding questions about the course content.
14	Dec. 18 & DL		Final presentations

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Course evaluation

- Mini-project (40%)
- Final exam (60%)
 - written
 - 2h
 - without documentation



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Mini-project

- Mini-project
 - Type
 - ✓ teamwork (ideally 3 people)
 - Duration
 - ✓ throughout the semester
 - Goal
 - ✓ put into practice theoretical concepts to design, prototype and test a new interactive system
 - Deliverables
 - ✓ 7 milestones
 - ✓ 2 presentations (mid semester, end of semester)
 - ✓ 1 final report
 - More information
 - ✓ the mini-project description document available on Ilias



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Mini-project Description

- Work in group of 3
 - groups **must** be announced to the teacher by the 3rd lecture
- Follow the UCD process to design an application and perform a controlled evaluation
- Milestones
 1. Needs and Requirements (e.g. interviews, questionnaires)
 2. Personas + scenarios
 3. Design choices
 4. Low fidelity prototyping
 5. Evaluation design
 6. Controlled evaluation (with at least 6 users)
 7. Analysis of evaluation results



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Presentations

- **Two presentations:**
 - November 13th
 - ✓ about 10 minutes
 - ✓ present your project topic
 - ✓ discuss the requirements and technical constraints and present the low-fidelity prototype of your device or application
 - December 18th
 - ✓ about 15 minutes
 - ✓ present your project topic and prototype, then describe the evaluation plan for your device or application
 - ✓ discuss the evaluation protocol and evaluation results of your controlled evaluation
- **Note:**
 - The presentations should be done using Powerpoint slides (or a similar software)
 - Every group member should speak during the presentation



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Report

▪ Report:

- Due on December 18th (the day of the presentation)
- Should include
 - ✓ a description of your device/application
 - ✓ a synthesis of the design process, key decisions and evaluation plan (milestones 1-5)
 - ✓ a detailed description of the evaluation plan for the controlled evaluation and the results of the evaluation (milestone 6-7)
 - ✓ a discussion of what you would have done differently if you had to do it again – what worked and what didn't



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Project theme: Digital Coach/Assistant/Companion

▪ Goal:

- Create an application that will actively help or encourage people to meet some set of goals.

▪ Can use

- Any device – laptop, mobile, smartwatch...
- Any interaction method – touch, speech, mouse/keyboard, gesture...

▪ Possible topics

- Train for a race or marathon
- Keep track of tasks to do
- Eat healthier
- Loose weight
- Exercise more
- Take more breaks
- ...



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Contact Information

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▪ Prof. Denis Lalanne

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- Note: Please send your questions/emails to Dr. Lisowska Masson, with Prof. Lalanne in CC.



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Now...

▪ Brainstorming session around project theme



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