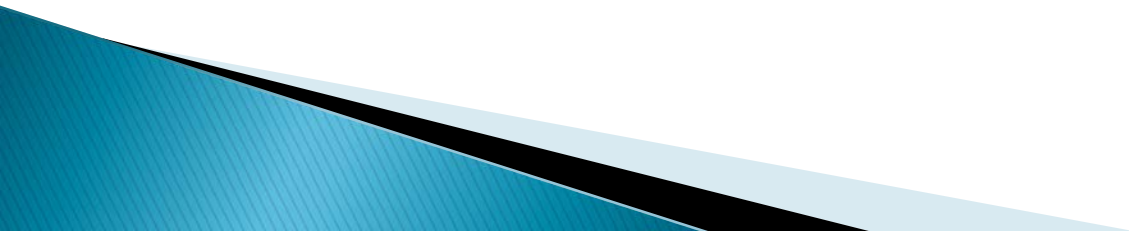


Professors d'IDI - UPC

# Interacció i Disseny d'Interfícies



# IDI – Organització

## ► Temari de teoria (HCI)

- Introducció a HCI, principis generals de disseny, percepció i color (2 sessions)
- Interacció (2 sessions)
  - Hicks, Fitts...
  - Sistemes i mètodes interacció i selecció
- Usability testing. Mètodes quantitativs per experiments (1 sessió)
- Mètodes d'interacció avançada. RV, RA (1 sessió)

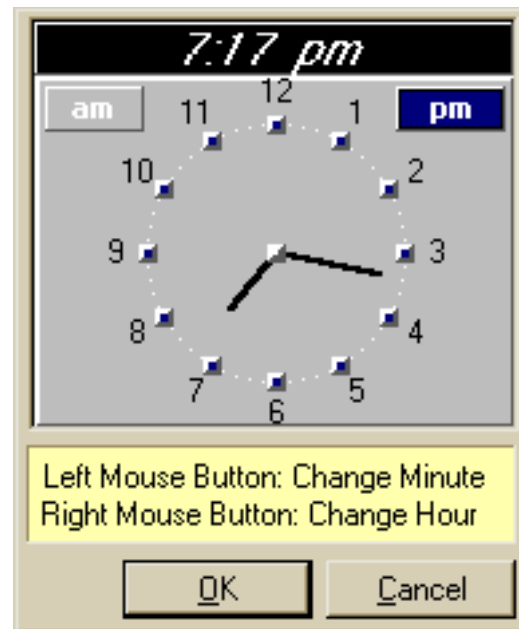
# Continguts

- ▶ Apunts i transparències de suport
- ▶ Referències útils a la web:
  - <http://usability.gov>
  - <http://uxbooth.com>
  - <https://usabilitygeek.com>
  - <http://www.nngroup.com/articles/>
  - <http://www.interaction-design.org/encyclopedia/>
  - <https://uxdesign.cc/>
  - <http://uxplanet.org/>

# Motivation

Enter your Social Security Number:

0	▼	0	▼	0	▼	-	0	▼	0	▼	-	0	▼	0	▼	0	▼	0	▼
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---



# Definitions: HCI

- ▶ **What does HCI mean? Which are its objectives?**
  - **Human computer interaction** is a field that deals with the study (to improve) of how humans interact with machines/devices.
  - HCI is a very relevant issue when evaluating the quality of an application.
    - An application must fulfill its requirements,
    - It has to provide an easy access to its features.

# Definitions: UI

- ▶ When an application is difficult to use, it is perceived as a low-quality application.
  - **User Interfaces:** tools and methods that are used to communicate between the user and the system
  - **User Interfaces** may be determinant on ease of use perception of application

# Definitions

- ▶ HCI is about
  - *understanding* and critically *evaluating* the interactive technologies people use and experience
  - understanding contemporary human practices and aspirations

# HCI. Initial models

- ▶ Software crisis in the 70s lead to focus software engineering with a new view
  - Including non functional requirements such as usability and maintainability



# HCI. Initial models

- ▶ One of the original focus of HCI was *usability*.
  - Originally stated as "easy to learn, easy to use"
  - More on this later today...
  - GUI: **comprehensible, accessible, easy to use**
- ▶ Helped to influence computer science and technology development more broadly and effectively
- ▶ It grew to include other areas, not restricted to computer science

# Usability

- ▶ Usability: Defined in ISO 9241 standard as
  - The ability in which a product may be used by **specific** users in order to carry out **specific** tasks *effectively, efficiently, and with satisfaction* in a **specific** use environment.
  - Usability is always referred to a concrete user group and a concrete user application

# Usability

- ▶ Usability:
  - **Efficacy** is the ability of correctly and completely achieving a certain goal.
  - **Efficiency** is the relation of used resources and the completeness and correctness of achieved goals.
  - **Satisfaction** is the comfort and acceptance of a system by the users and other people that are affected by its use.

# Definitions

## ▶ User experience (UX):

- “Experience or User Experience is not about technology, industrial design, or interfaces. It is about **creating a meaningful experience through a device.**”
- “the perception left in someone's mind following a series of interactions between people, **devices**, and events”
- What you **remember and feel** from the use of a device

# Definitions

- ▶ User experience (Peter Morville's honeycomb):



# Definitions

- ▶ Interaction Design:
  - “Interaction design is about shaping digital things for people’s use”
    - How we interact with **devices** (“digital things”)



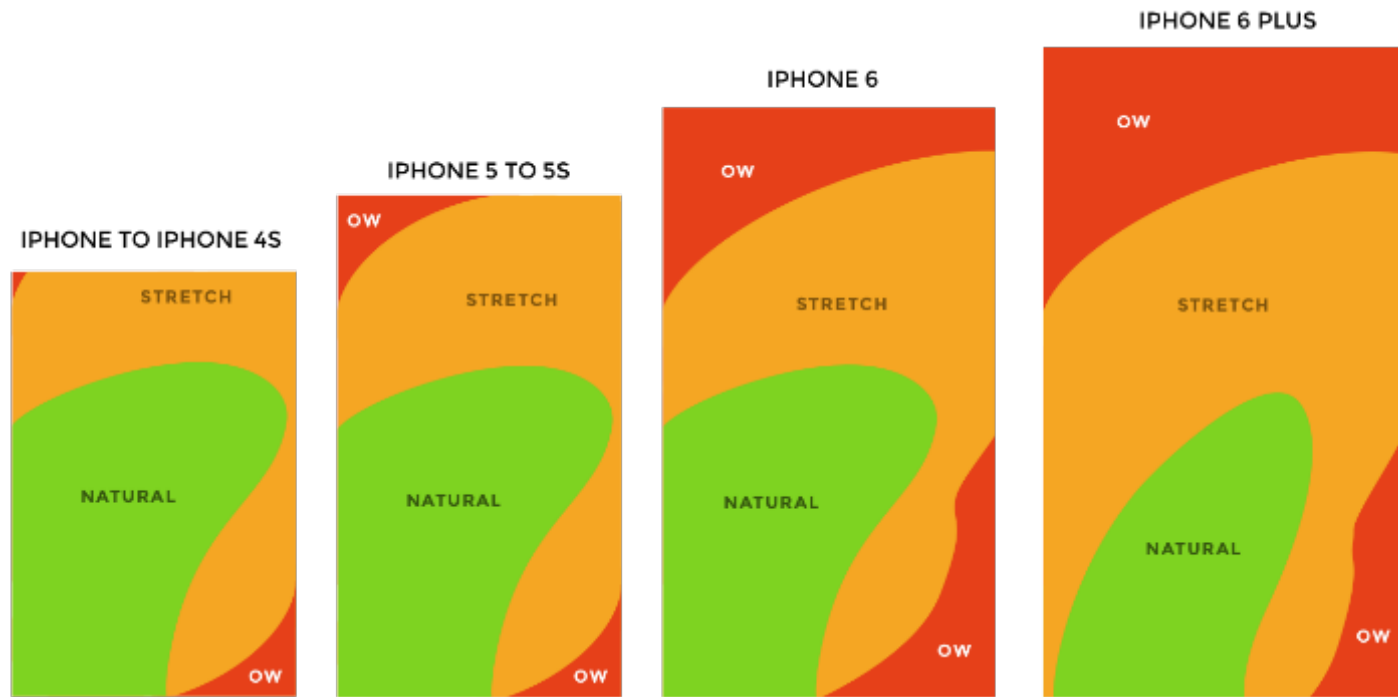
# Definitions

- ▶ Interaction Design:
  - Unlock with your face?



# HCI & UX. Some requirements

- ▶ For mobile take into account the thumb zones





# HCI. Desktop systems

- ▶ Desktop systems:
  - Large screens
    - Space for *everything*
  - Mouse pointer
  - Keyboard
    - Adequate for creating content

# HCI. Mobile systems

- ▶ Mobile systems:
  - (Relatively) Small size
    - Must carefully think on what to fit
    - Notifications often not properly solved
  - Interaction with the finger/stylus
  - (Almost) No keyboard
  - Software limitations

# HCI. Mobile systems

- ▶ Tablet systems:
  - (Relatively) Large size
    - May fit what we need
  - Interaction with the finger/stylus
  - (Almost) No keyboard
  - Software limitations

# HCI. GUI (& app) Programming

- ▶ Tools for Mobile Development:
  - Native tools
    - Provided by the OS designers
    - Focus on the OS features
  - Cross-platform
    - Provided by third-party institutions
    - Focus on facilitating the development
  - Other third-party software
    - Focus on facilitating the development

# HCI. GUI (& app) Programming

- ▶ Two main ways to develop:
  - Web apps
  - Native OS apps

# HCI. GUI (& app) Programming

## ▶ Web apps. Pros:

- Develop once & deploy everywhere
  - Almost any system has a capable browser
- Easy updating
  - App is loaded everytime the browser connects to the page
    - Only needed to change the server code
- Well-known tools and techniques
  - PHP, Java...

# HCI. GUI (& app) Programming

## ► Web apps. Cons:

- Limited user interfaces
- Not as rich as native apps in terms of:
  - UI, Communication, Access to local resources  
(camera, GPS,...)
- Inefficient and insecure communication protocol
- Mainly designed for large displays with mouse

# HCI. GUI (& app) Programming

## ▶ Native apps. Pros:

- Richer UI
- Many controls
- Safe and fast access to local resources
  - GPS, camera, files...
  - Efficient communication
  - Any protocols allowed
- Smaller variety in languages and tools (SDK)
- Designed for small screens and touch controls



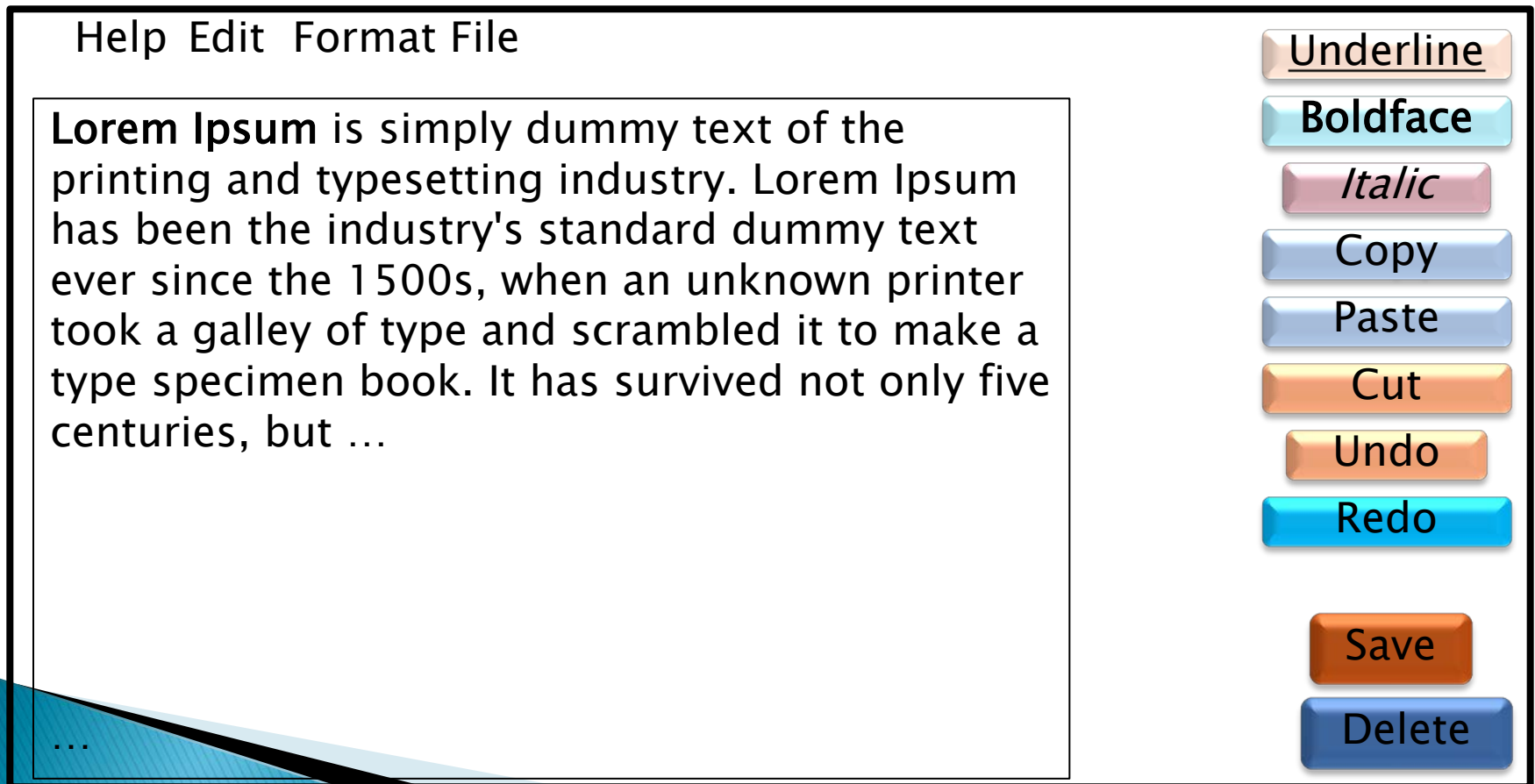
# HCI. GUI (& app) Programming

## ▶ Native apps. Cons:

- No universal access
  - Each OS has a different app format and development environment
- Difficult to manage updates
  - Require individual (user guided) updates per device
- Less general than desktop programming
  - Though a lot of new material is on the web

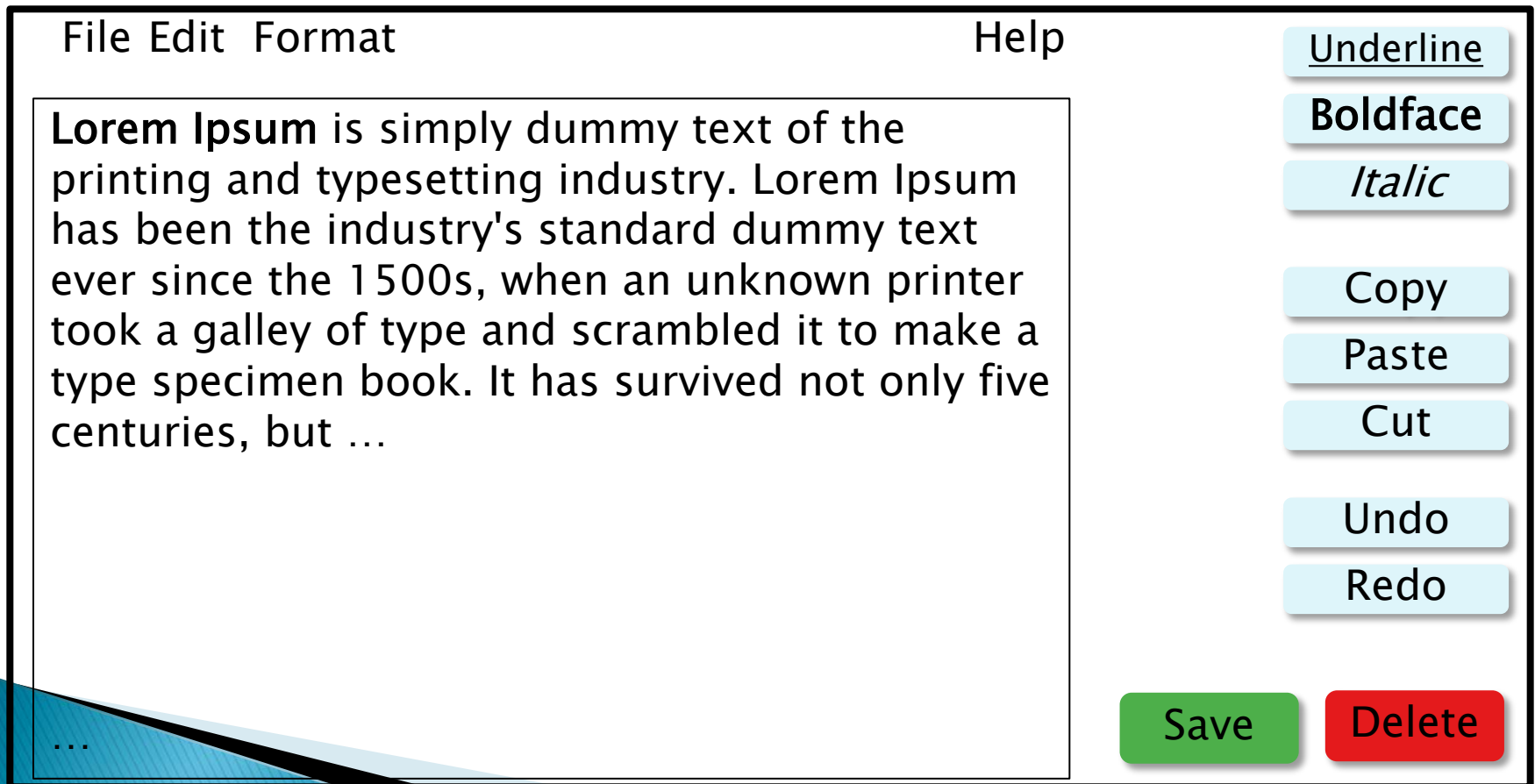
# UI Example. Redesign

What's wrong with this simple text editor?



# UI Example. Redesign

Better design:



Professors d'IDI - UPC

# Interacció i Disseny d'Interfícies

