



# Obiettivi

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1. Sviluppare un design incentrato sull'utente
2. Regole con cui viene sviluppato il design
3. Integrarsi nel ciclo di sviluppo del Sistema Informativo

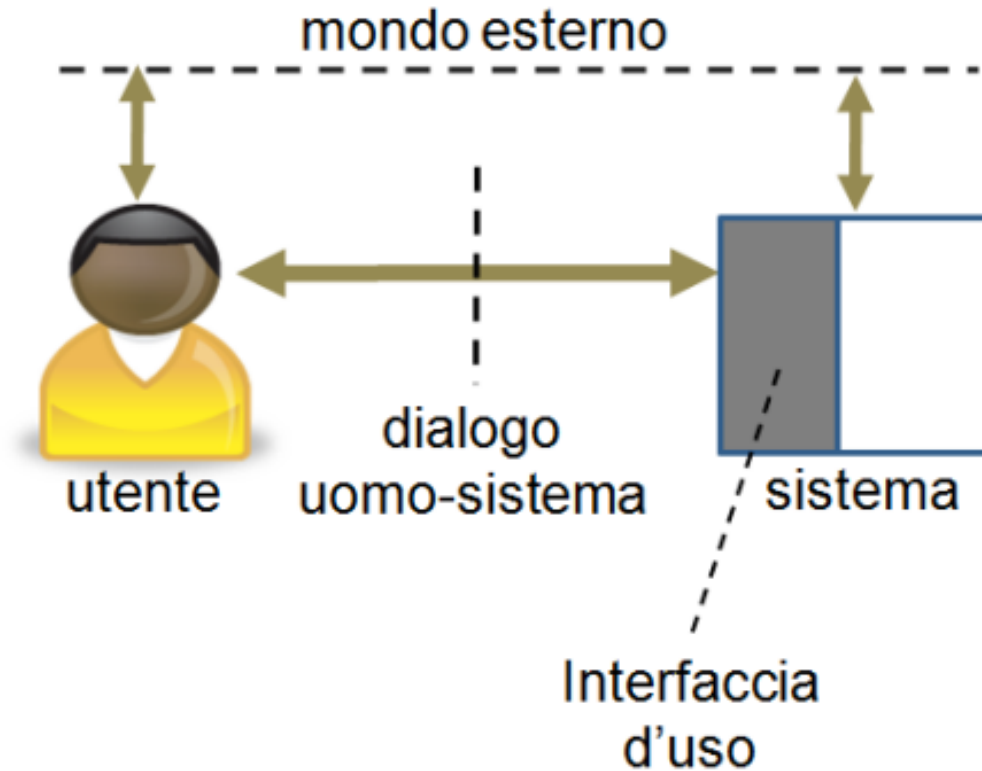
# Argomenti

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- ▶ Introduzione all'usabilità
- ▶ Progettazione human centered
- ▶ Mockup di interfacce

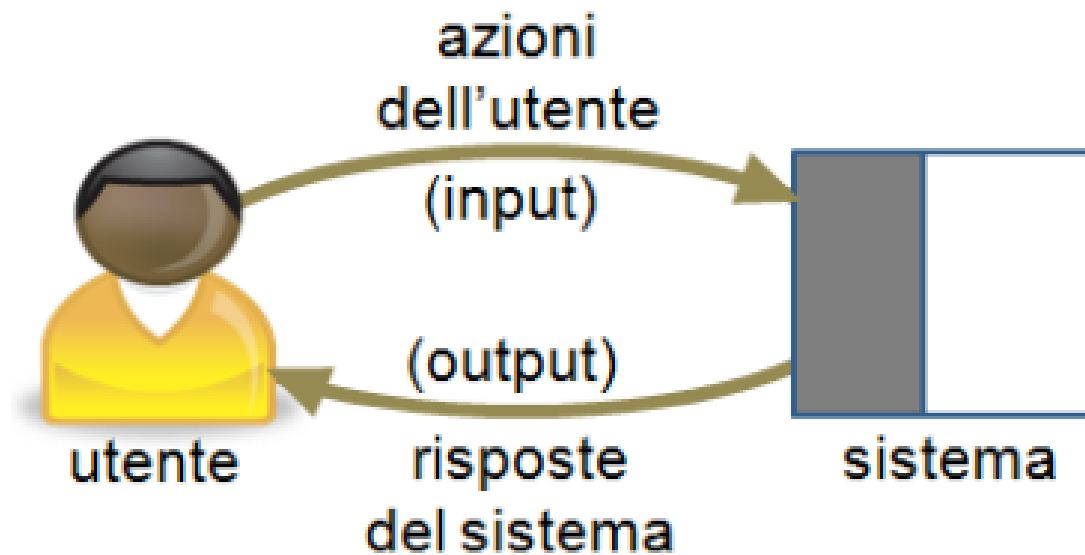
# Il ruolo dell'interfaccia

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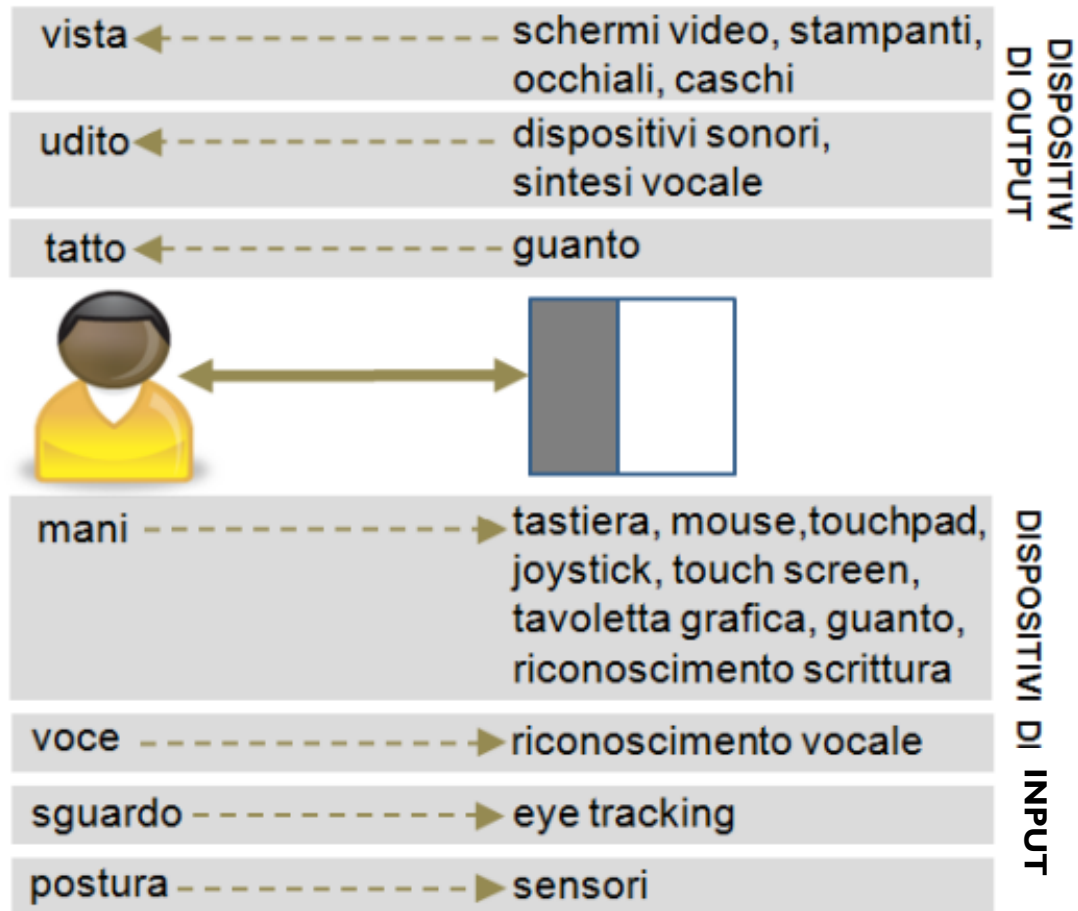


# Come?

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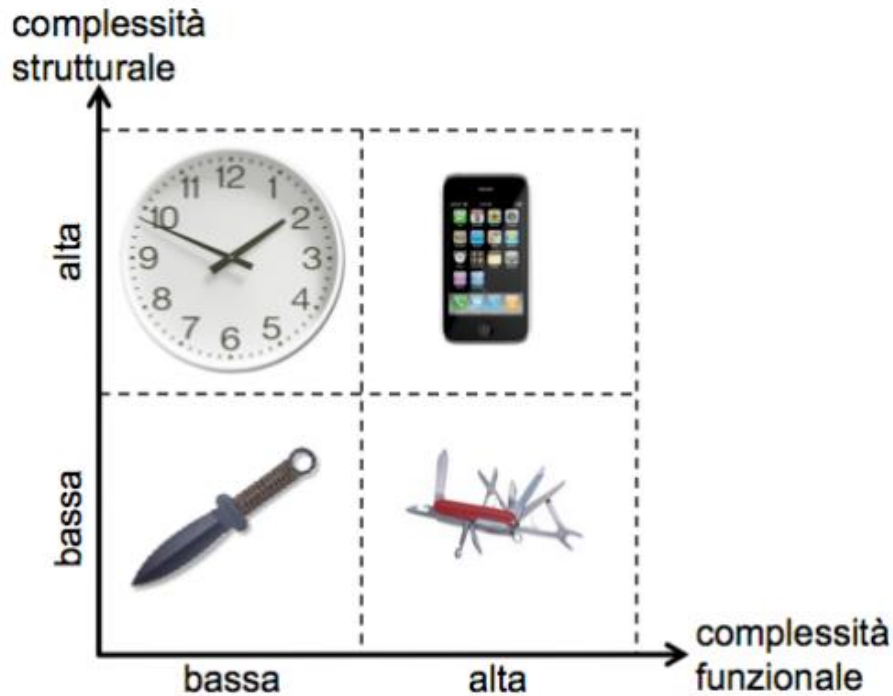


# Sensi e strumenti

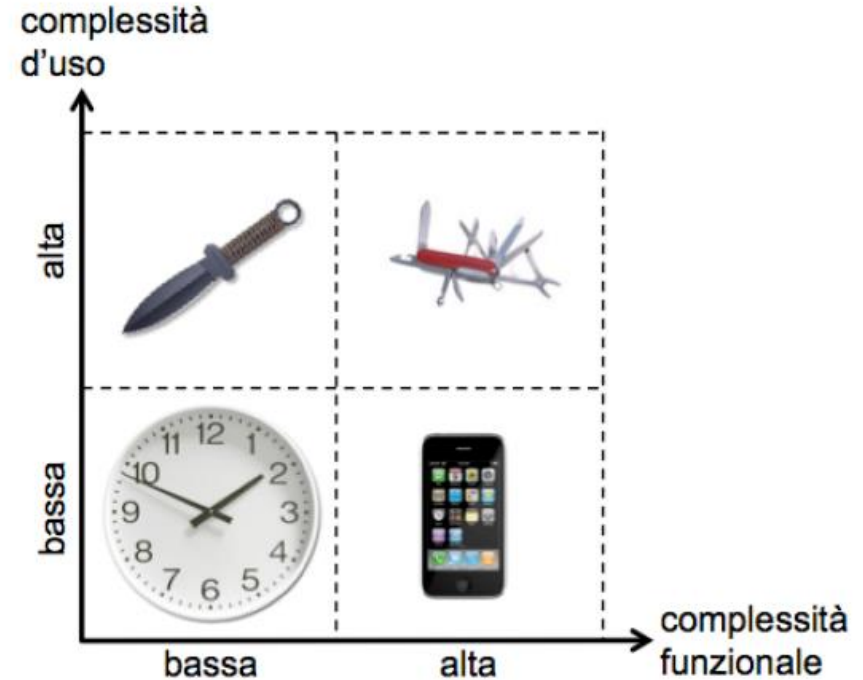
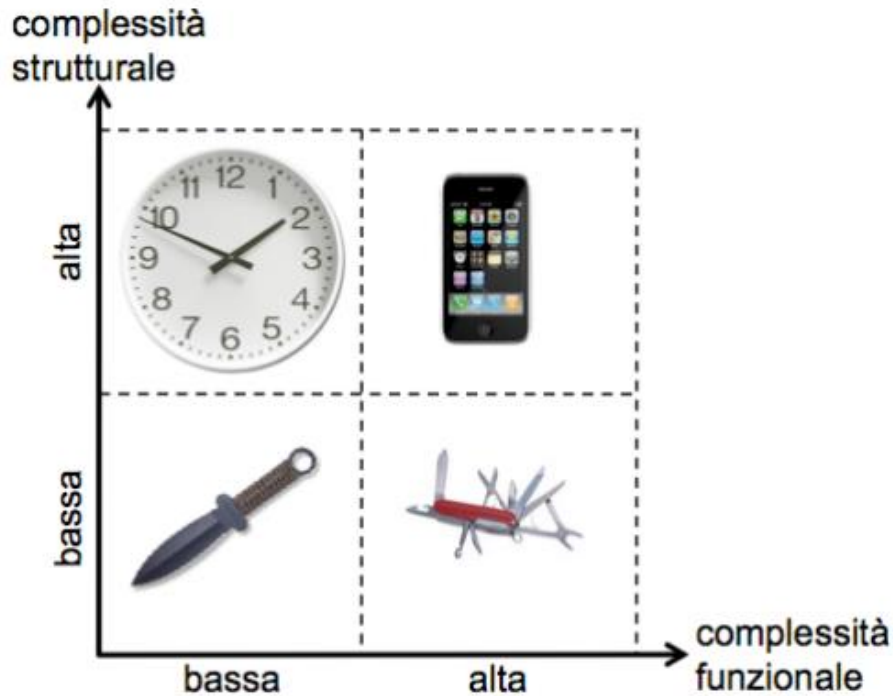
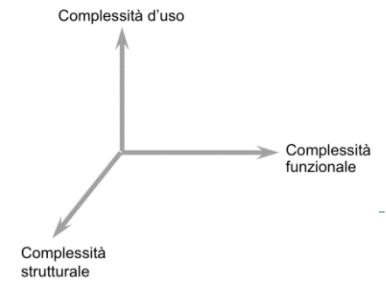


# Livelli di complessità

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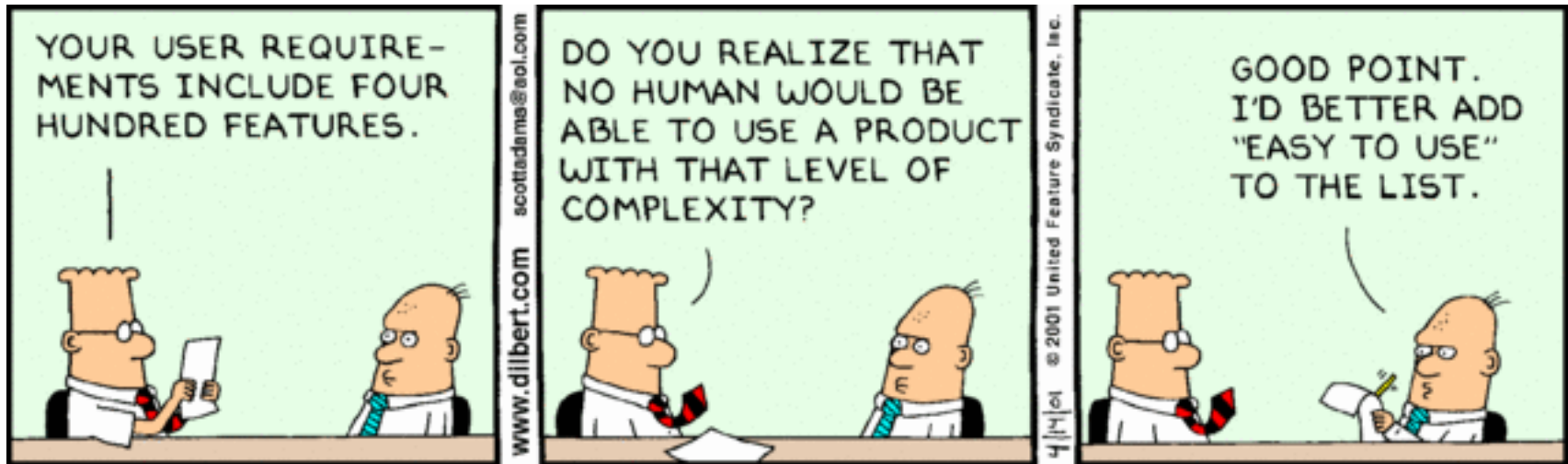
# Livelli di complessità





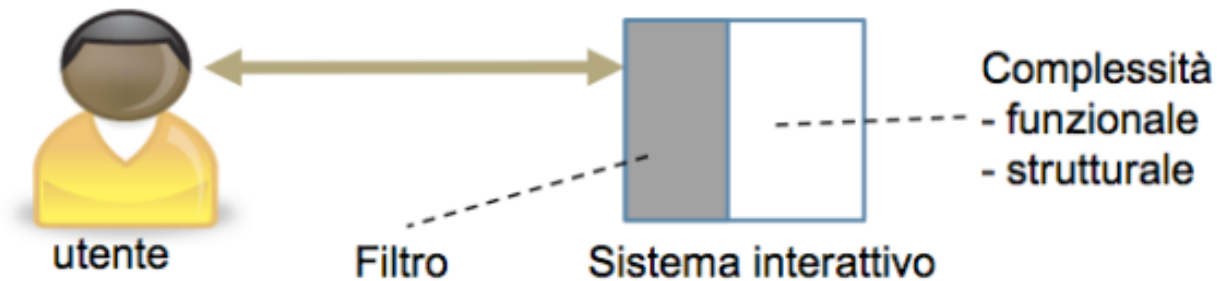
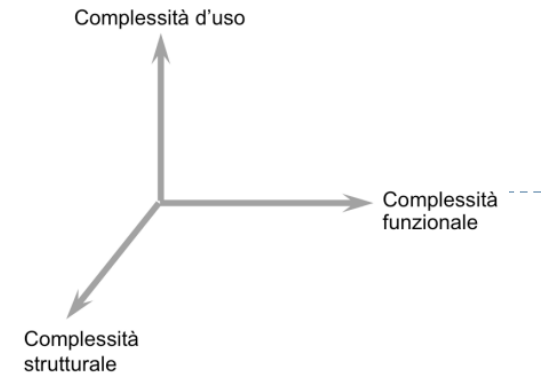
# Complexity

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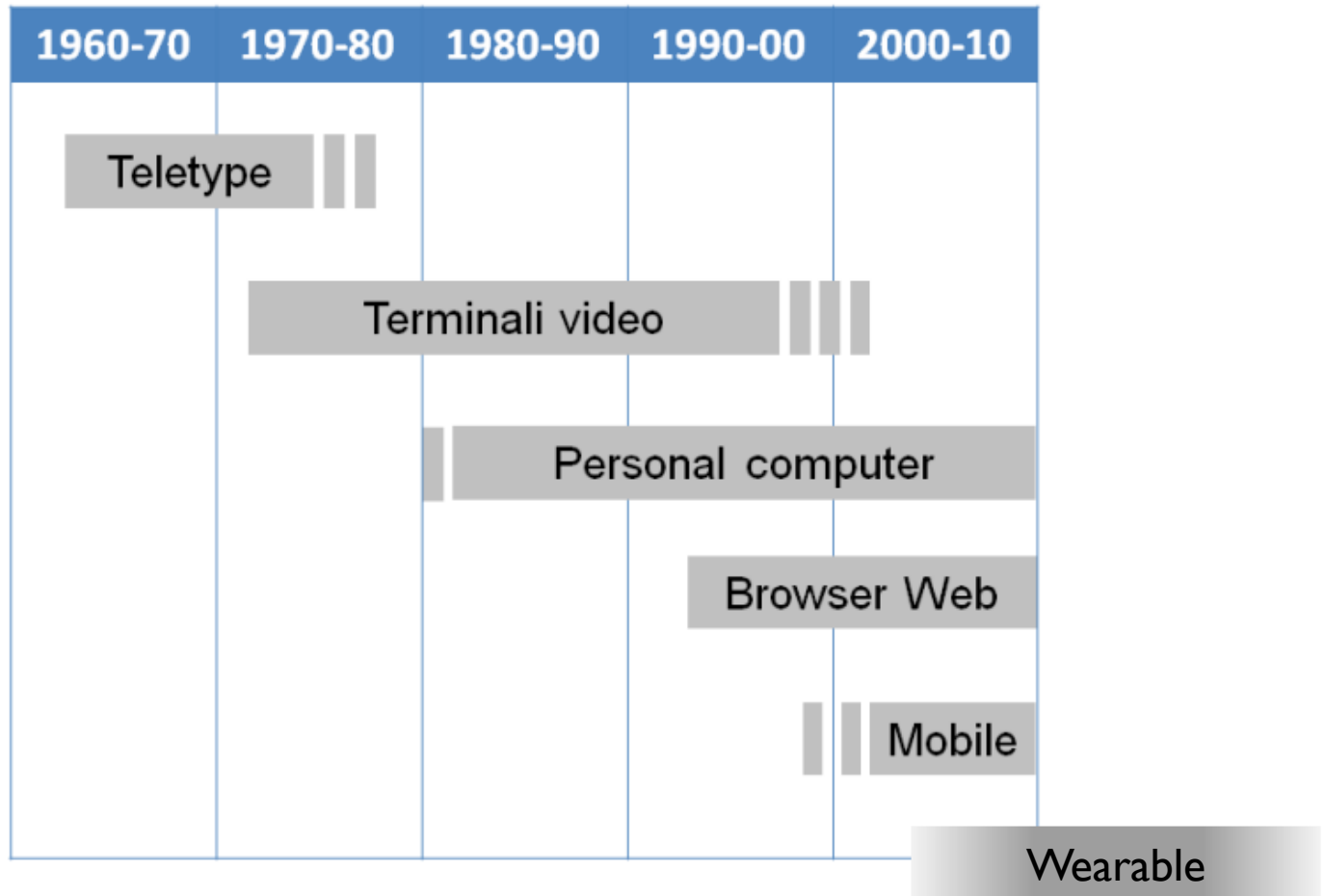
# Progettazione dell'usabilità

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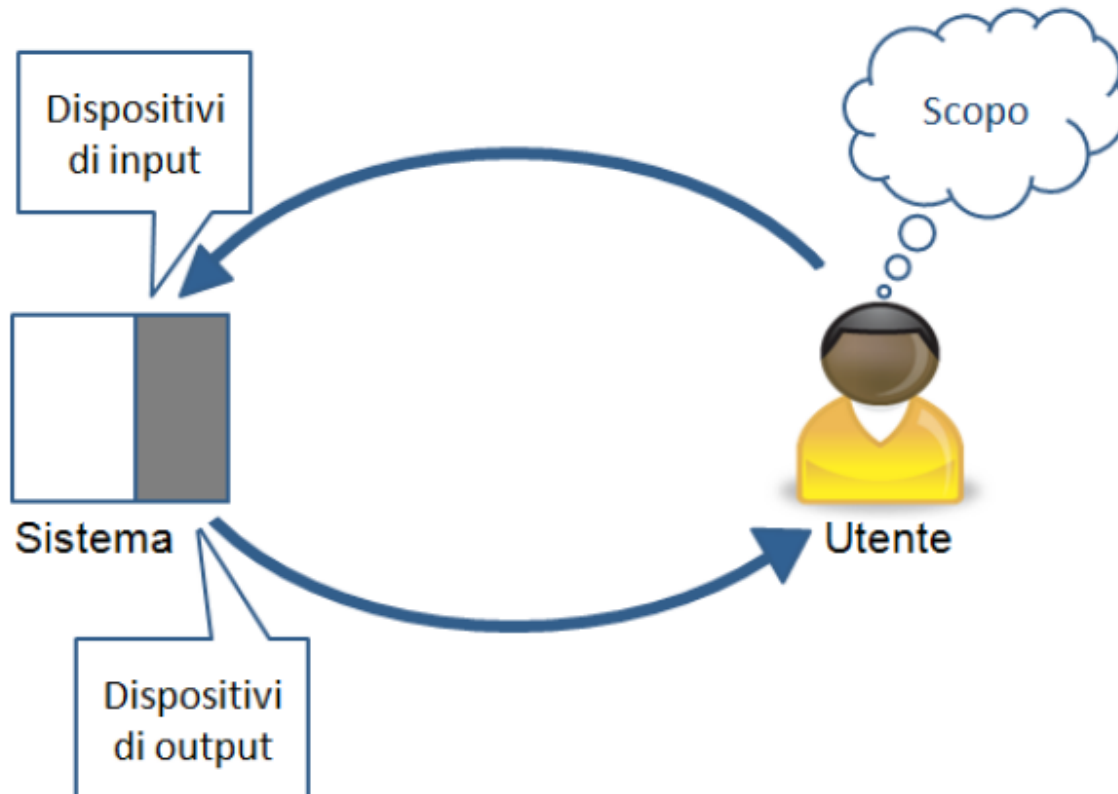
# Tecnologie di interazione

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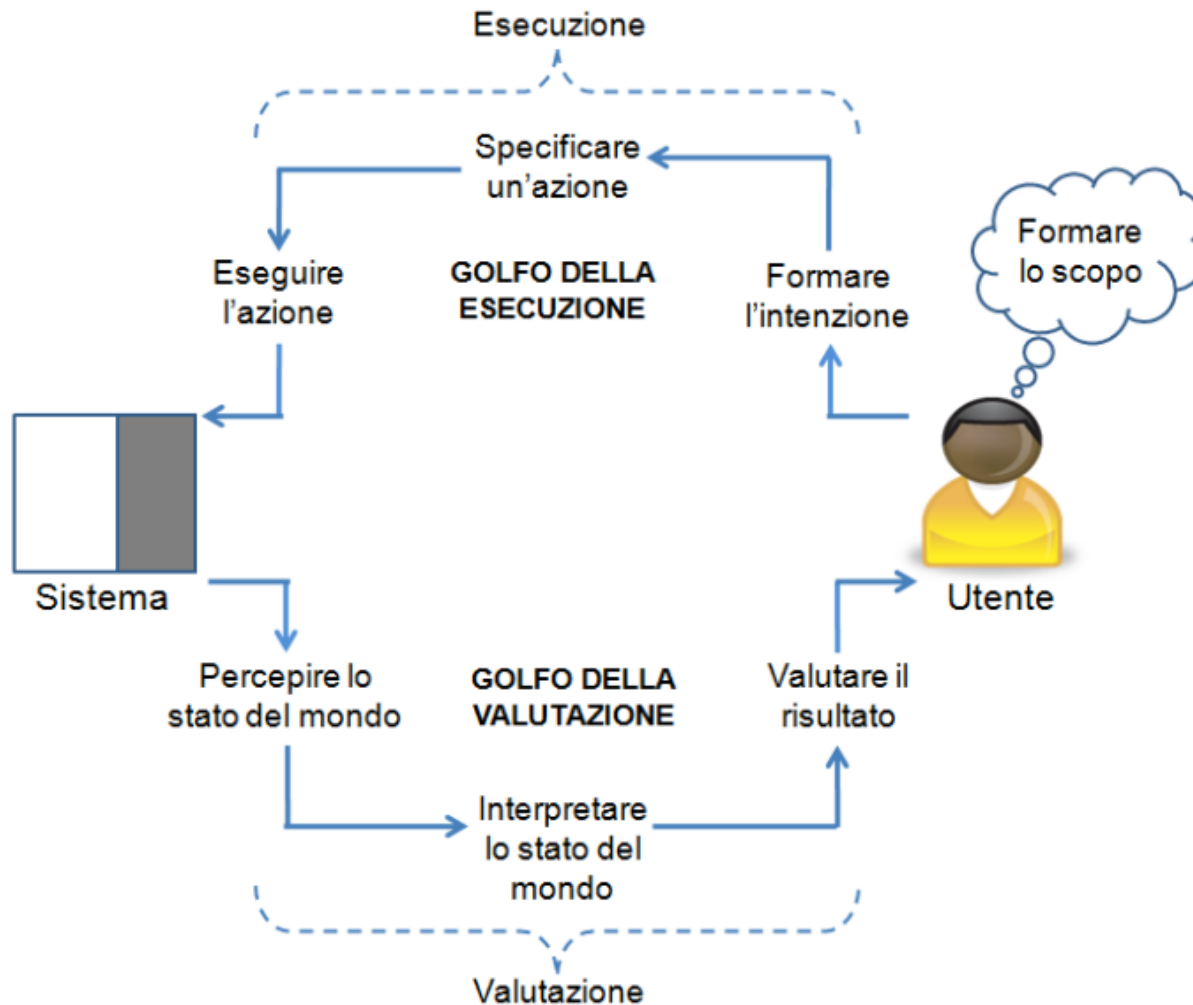


# User goals

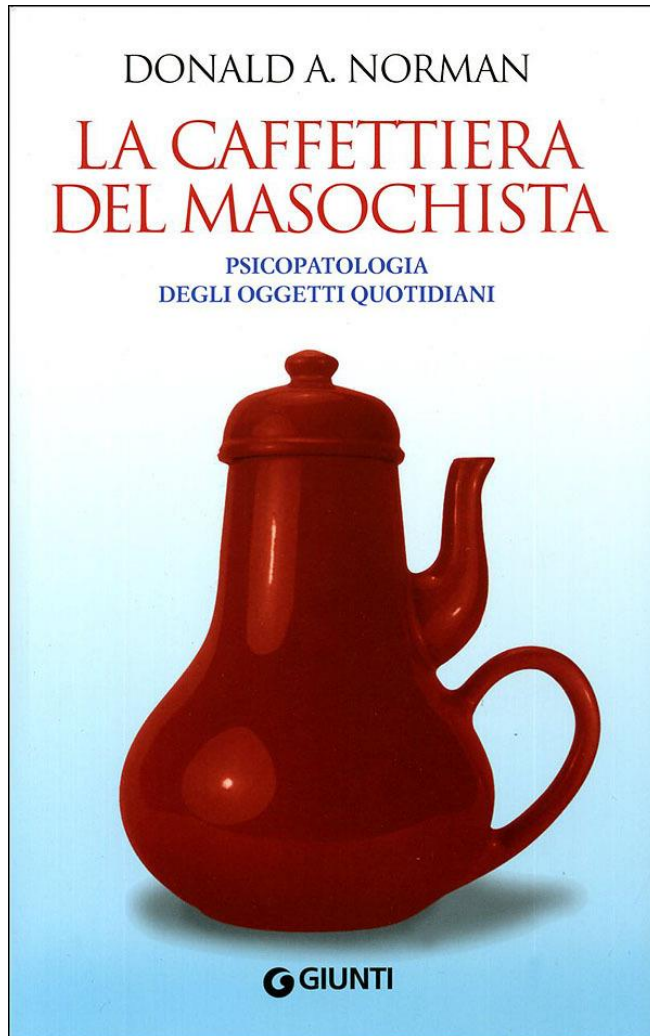
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# Il modello di Norman



# Donald Norman



[http://it.wikipedia.org/wiki/Donald\\_Norman](http://it.wikipedia.org/wiki/Donald_Norman)

# Nielsen Norman Group

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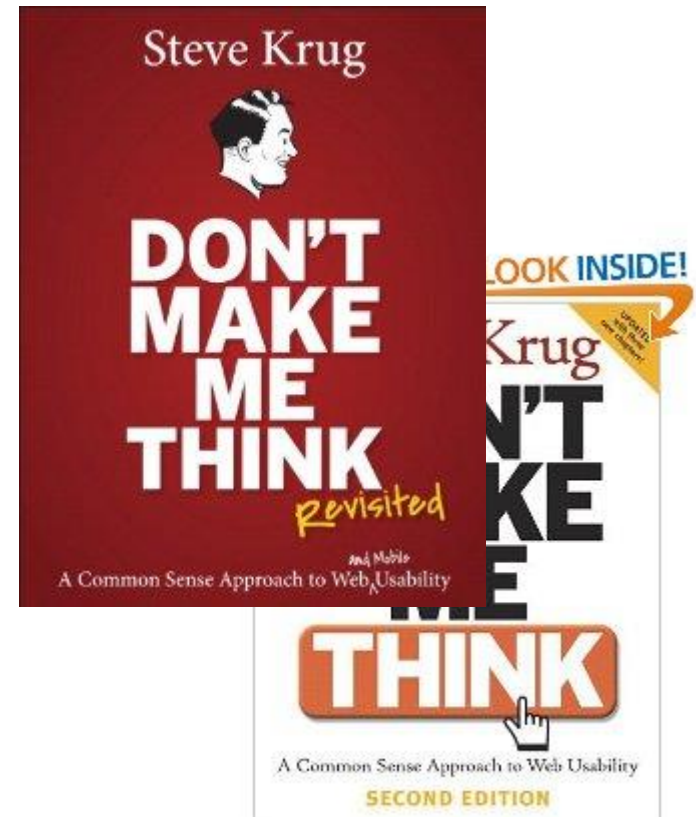


- ▶ Jakob Nielsen
- ▶ Co-founded with Don Norman
- ▶ <http://www.nngroup.com/articles/>

# Don't make me think

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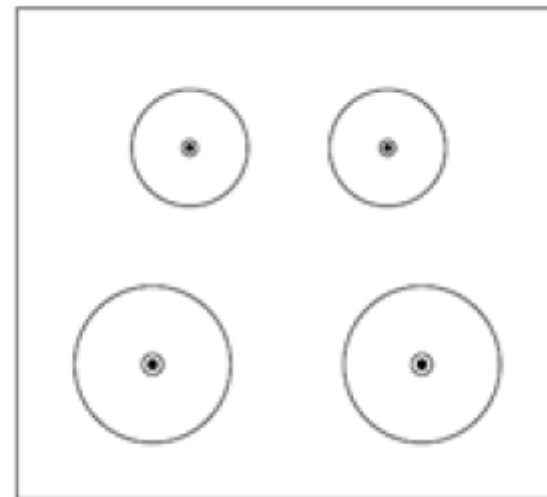
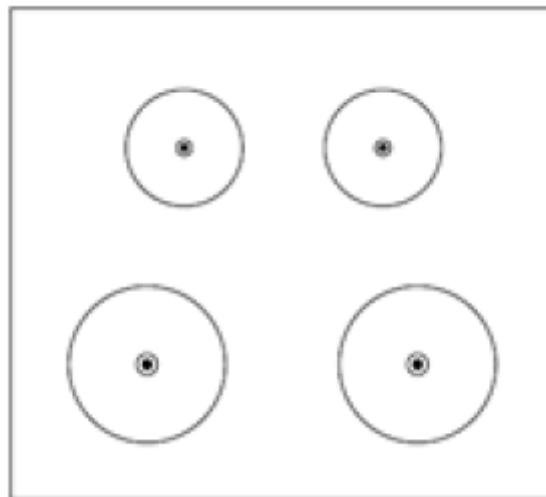
- ▶ The “motto” of usability
- ▶ Steve Krug, <http://www.sensible.com/>





# Affordance: fornelli

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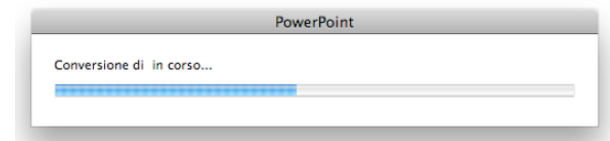
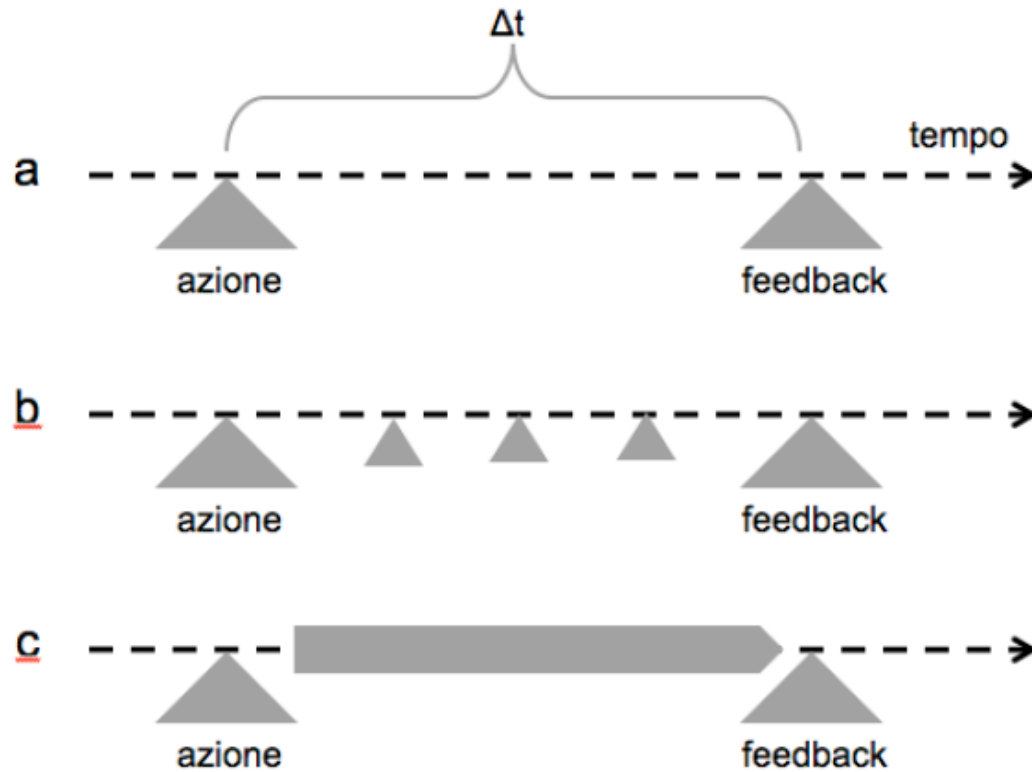


# Affordance





# Feedback



# Discipline coinvolte

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User Experience Design (UXd)

how the user thinks and feels

Information Architecture (IA)

how the system is organized

User Interface Design (UI)

how the content is organized

Interaction Design (IXd)

how the user and device act and react



<http://userflow.tumblr.com/post/3877937295/uxd-ia-ui-ixd>

MA IO VOLEVO SOLO ACCENDERE  
LA TELEVISIONE !!



# L'approccio tradizionale

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# L'approccio tradizionale

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## Es.: Ascensore

- Andare al piano n
- Aprire / chiudere porta
- Fermarsi
- Inviare allarme



Ci chiediamo quali **funzioni**  
il sistema deve fornire al suo utente,  
le progettiamo e le realizziamo  
(**Progettazione orientata al sistema**)



# Il nuovo approccio

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## Es.: Ascensore

- Andare al piano n
- Aprire / chiudere porta
- Fermarsi
- Inviare allarme



## Es.: Ascensore

- Chiama l'ascensore
- Entra nell'ascensore
- Seleziona un piano
- Ferma l'ascensore
- Chiede aiuto
- Esce dall'ascensore

Ci chiediamo quali sono i “casi d'uso” dell'utente rispetto al sistema...

**(Progettazione orientata all'utente)**

# Il nuovo approccio



## Es.: Ascensore

- Chiama l'ascensore
- Entra nell'ascensore
- Seleziona un piano
- Ferma l'ascensore
- Chiede aiuto
- Esce dall'ascensore

... e **progettiamo l'interazione** di conseguenza

**(Interaction Design)**

# Esempio: Un altro ascensore

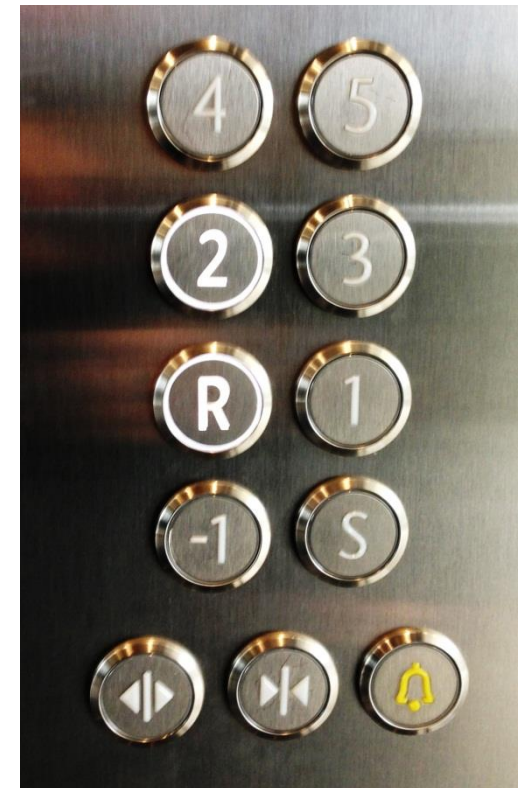
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## Casi d'uso

- Chiama l'ascensore
  - per scendere
  - per salire
- Entra nell'ascensore
- Seleziona un piano
- Ferma l'ascensore
- Chiede aiuto
- Apre porte
- Chiude porte
- Esce dall'ascensore



Fuori



Dentro

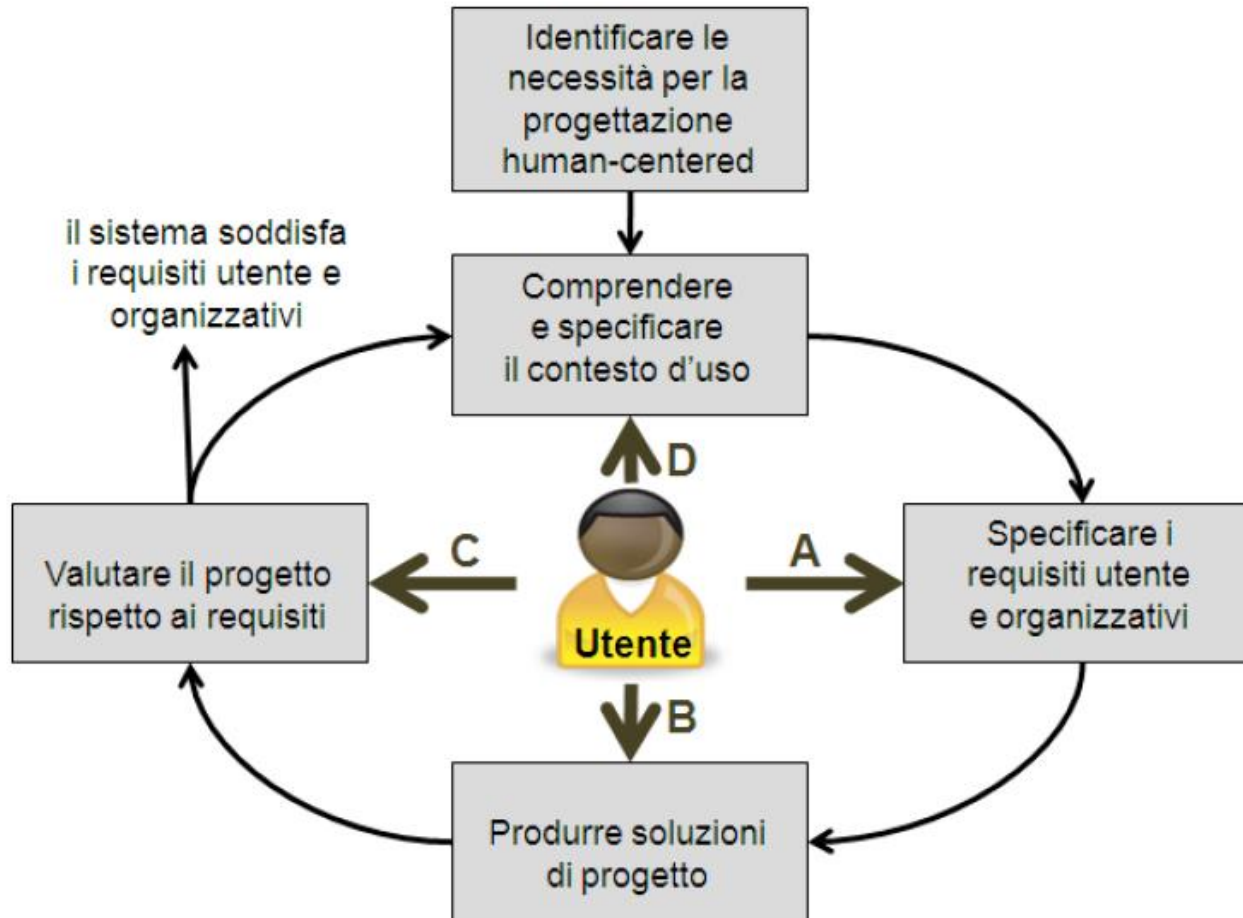
# Misteri....

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# Progettazione human centered

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# Definire i requisiti insieme all'utente

Tecnica	Serve per	Vantaggi	Svantaggi
Questionari	Rispondere a domande specifiche.	Si possono raggiungere molte persone con poco sforzo.	Vanno progettati con grande accuratezza, in caso contrario le risposte potrebbero risultare poco informative.  Il tasso di risposta può essere basso.
Interviste individuali	Esplorare determinati aspetti del problema e determinati punti di vista.	L'intervistatore può controllare il corso dell'intervista, orientandola verso quei temi sui quali l'intervistato è in grado di fornire i contributi più utili.	Richiedono molto tempo.  Gli intervistati potrebbero evitare di esprimersi con franchezza su alcuni aspetti delicati.
Focus group	Mettere a fuoco un determinato argomento, sul quale possono esserci diversi punti di vista.	Fanno emergere le aree di consenso e di conflitto.  Possono far emergere soluzioni condivise dal gruppo.	La loro conduzione richiede esperienza.  Possono emergere figure dominanti che monopolizzano la discussione.
Osservazioni sul campo	Comprendere il contesto delle attività dell'utente.	Permettono di ottenere una consapevolezza sull'uso reale del prodotto che le altre tecniche non danno.	Possono essere difficili da effettuare e richiedere molto tempo e risorse.
Suggerimenti spontanei degli utenti	Individuare specifiche necessità di miglioramento di un prodotto.	Hanno bassi costi di raccolta.  Possono essere molto specifici.	Hanno normalmente carattere episodico.
Analisi della concorrenza e delle best practices	Individuare le soluzioni migliori adottate nel settore di interesse.	Evitare di "reinventare la ruota" e ottenere vantaggio competitivo.	L'analisi di solito è costosa (tempo e risorse)



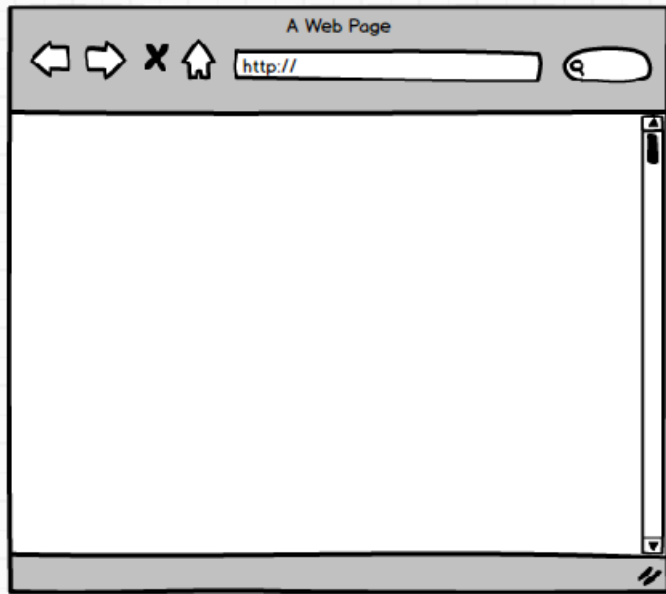
# Step di progettazione

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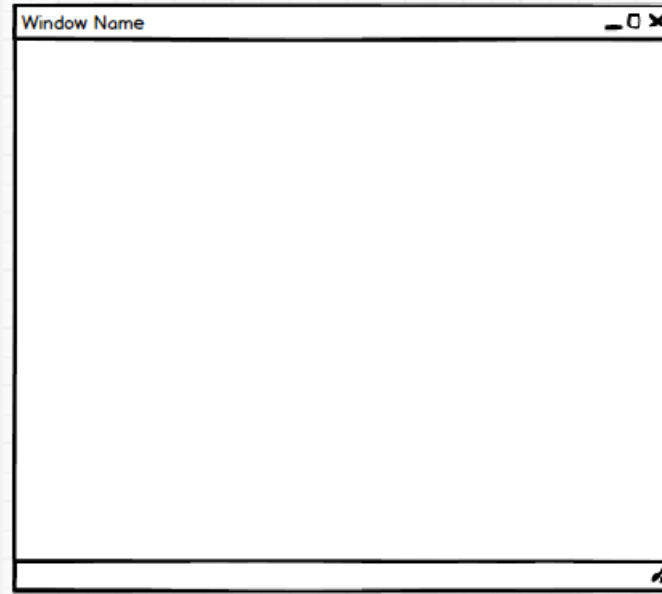
- ▶ Schizzo
- ▶ Wireframes
- ▶ Immagine statica (static comps)
- ▶ Functional mockups

# Le 3 interfacce

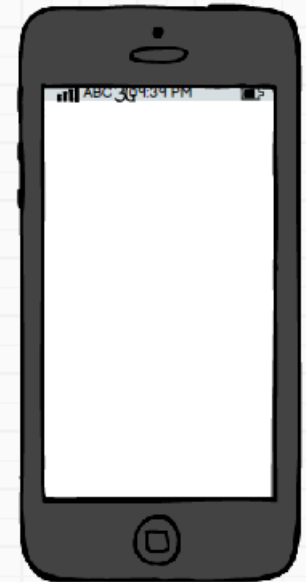
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Web



Desktop



Mobile



# Problematiche del progetto

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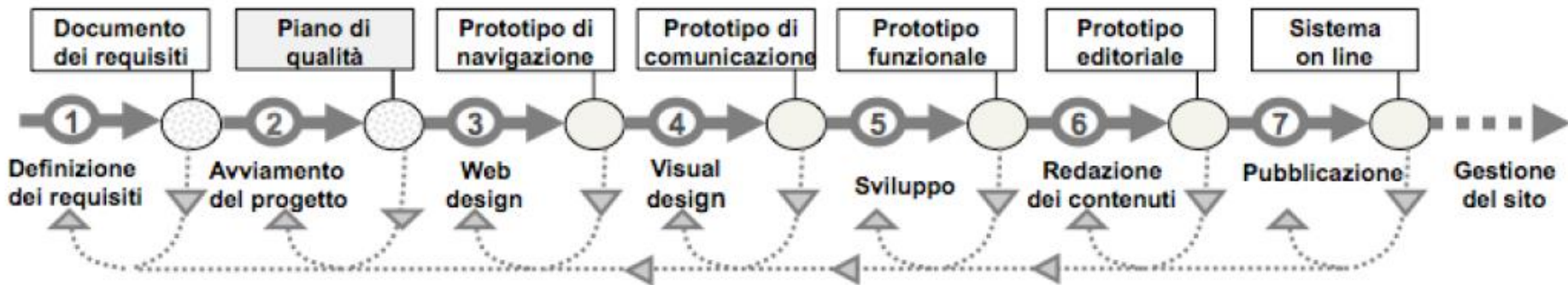
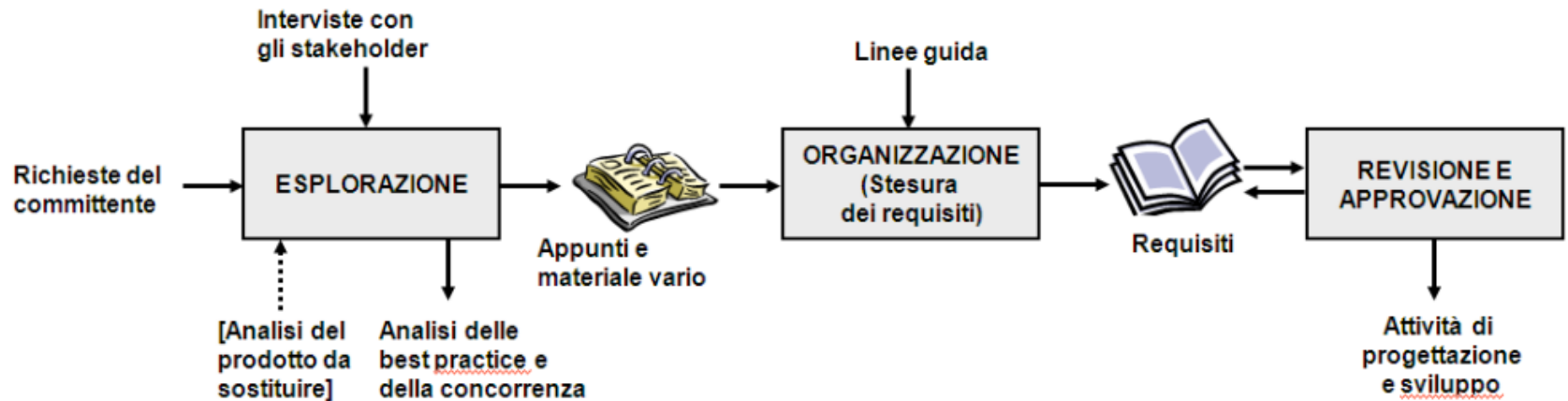
- ▶ Come sono collegati gli elementi tra di loro
- ▶ Come verranno percepiti dall'utente
- ▶ Che cosa deve avere visibilità immediata: meno azioni per raggiungere l'obiettivo

# Prototipi

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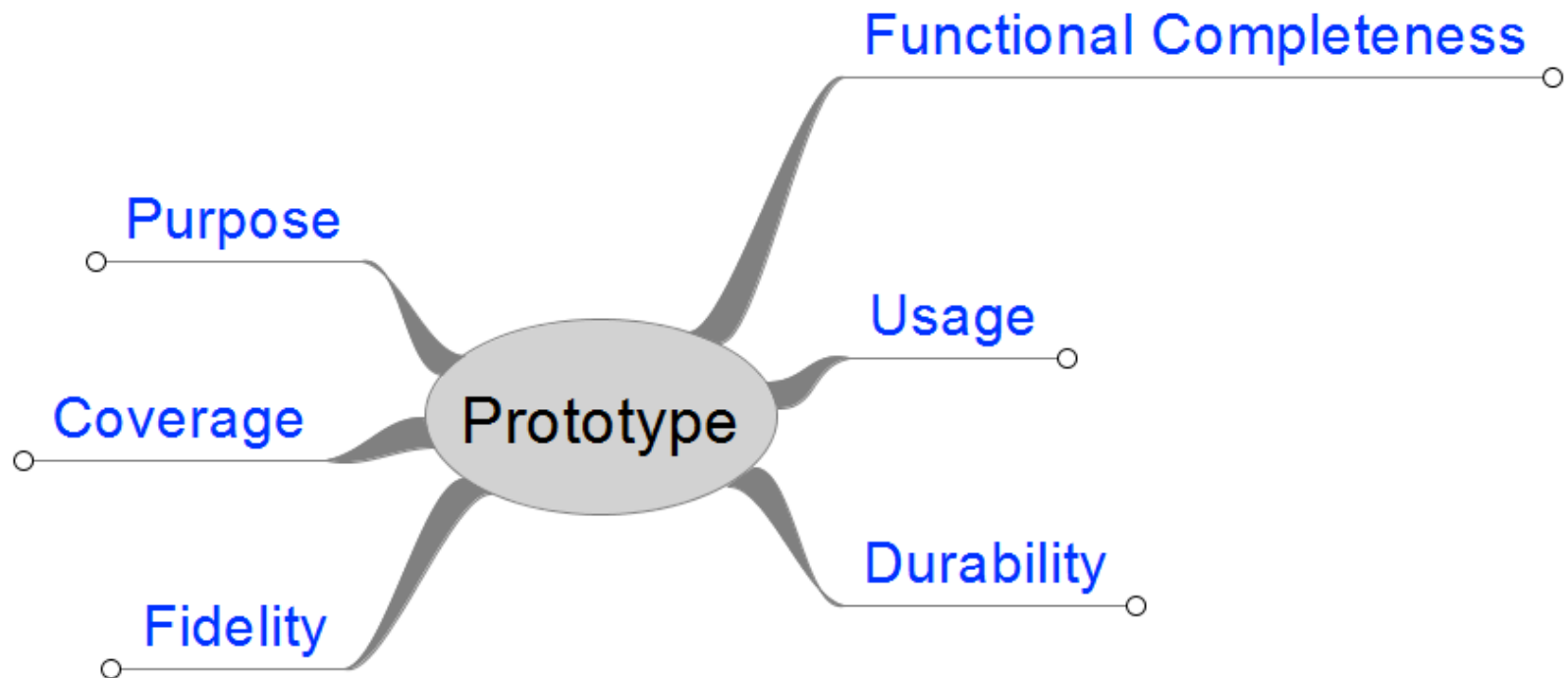
- ▶ Prototype =
- ▶ An easily modified and extensible model (representation, simulation or demonstration) of a planned software system, likely including its interface and input/output functionality

# Procedere per prototipi



# Caratteristiche dei prototipi

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# Prototipi: caratteristiche

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To evaluate the role of a product in the user's life

Role

To evaluate interaction modality between user and product

Interface

To evaluate technical aspects of product realization

Implementation

Purpose

# Prototipi: caratteristiche

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## A prototype of the entire system

- an expanded horizontal prototype
- models a greater number of features
- covers multiple levels of the system's structure chart
- useful throughout the design process

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## A prototype of a single usability-critical system component

- a vertical prototype that is focused on one feature
- useful at some specific stage of the design process

Global

Local

Coverage

# Prototipi: caratteristiche

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A set of drawings (e.g., storyboard) that provide a static, non-computerized, non-working mock-up of user interface for the planned system

Low

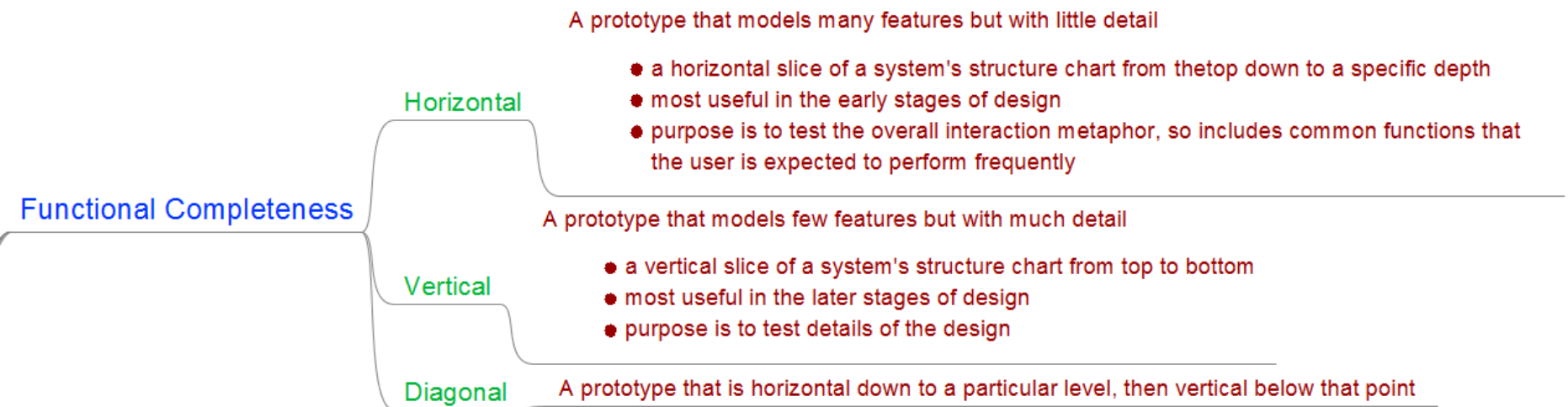
A set of screens that provide a dynamic, computerized, working model of the planned system

High

Fidelity

# Prototipi: caratteristiche

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# Prototipi: caratteristiche

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Usage	Static	Static representation of the product (storyboards, diagrams, ...)
	Dynamic	Dynamic (but not interactive) representation of the product (e.g., video)
	Interactive	Allows users to test the usage of the system, even if in an approximate and simplified way

# Prototipi: caratteristiche

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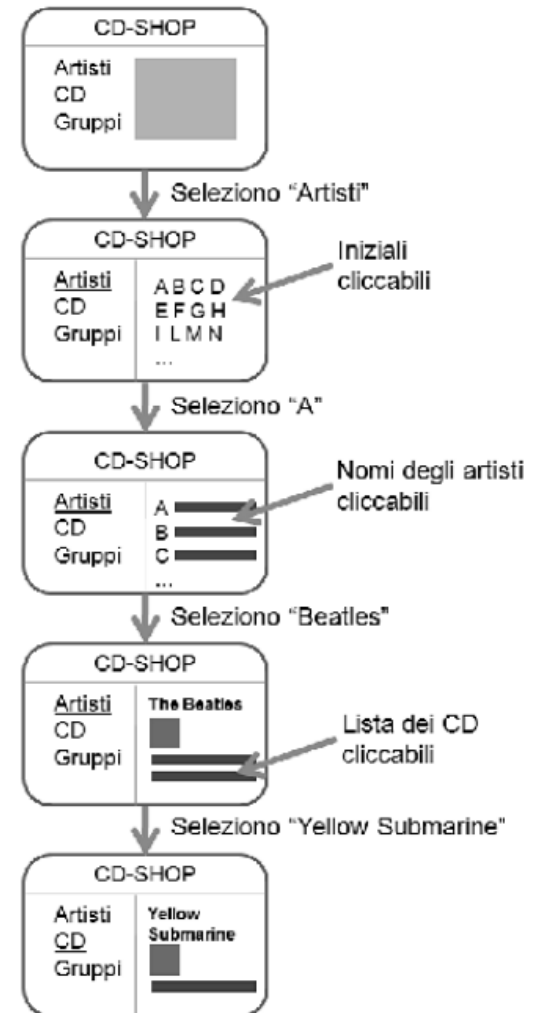
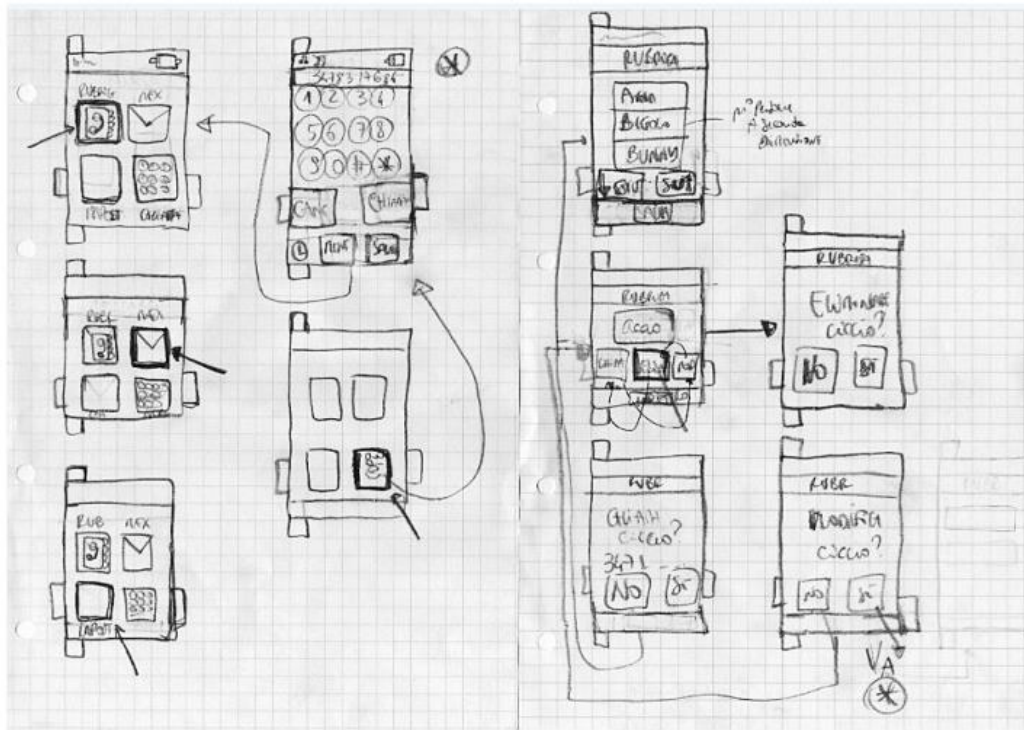
Durability	Exploratory	A throw-away prototype used to clarify project goals, to identify requirements, to examine alternative designs, or to investigate a large and complex system
	Experimental	A prototype used to validate system specifications
	Operational	An iterative prototype that is progressively refined until it becomes the final system

# Schizzo: step 0

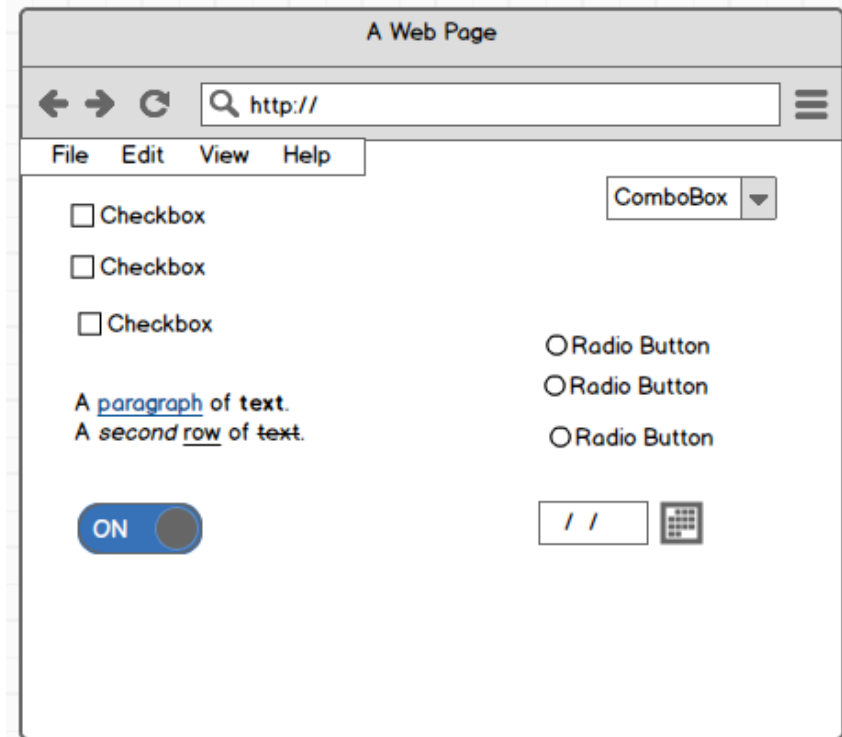
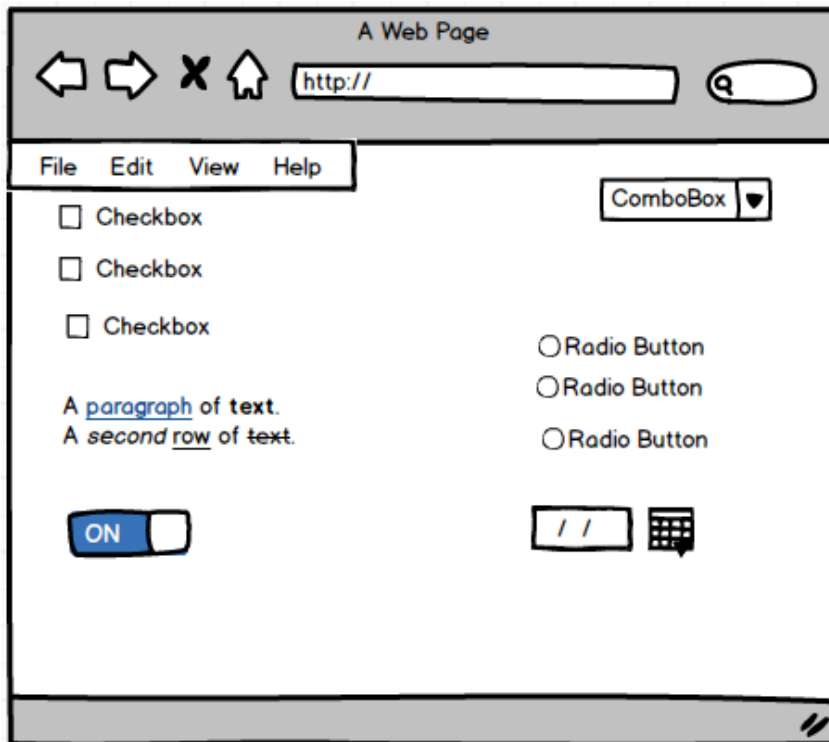
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# Schizzi / Storyboard



# Mockup vs Wireframe



# Prototipi di carta

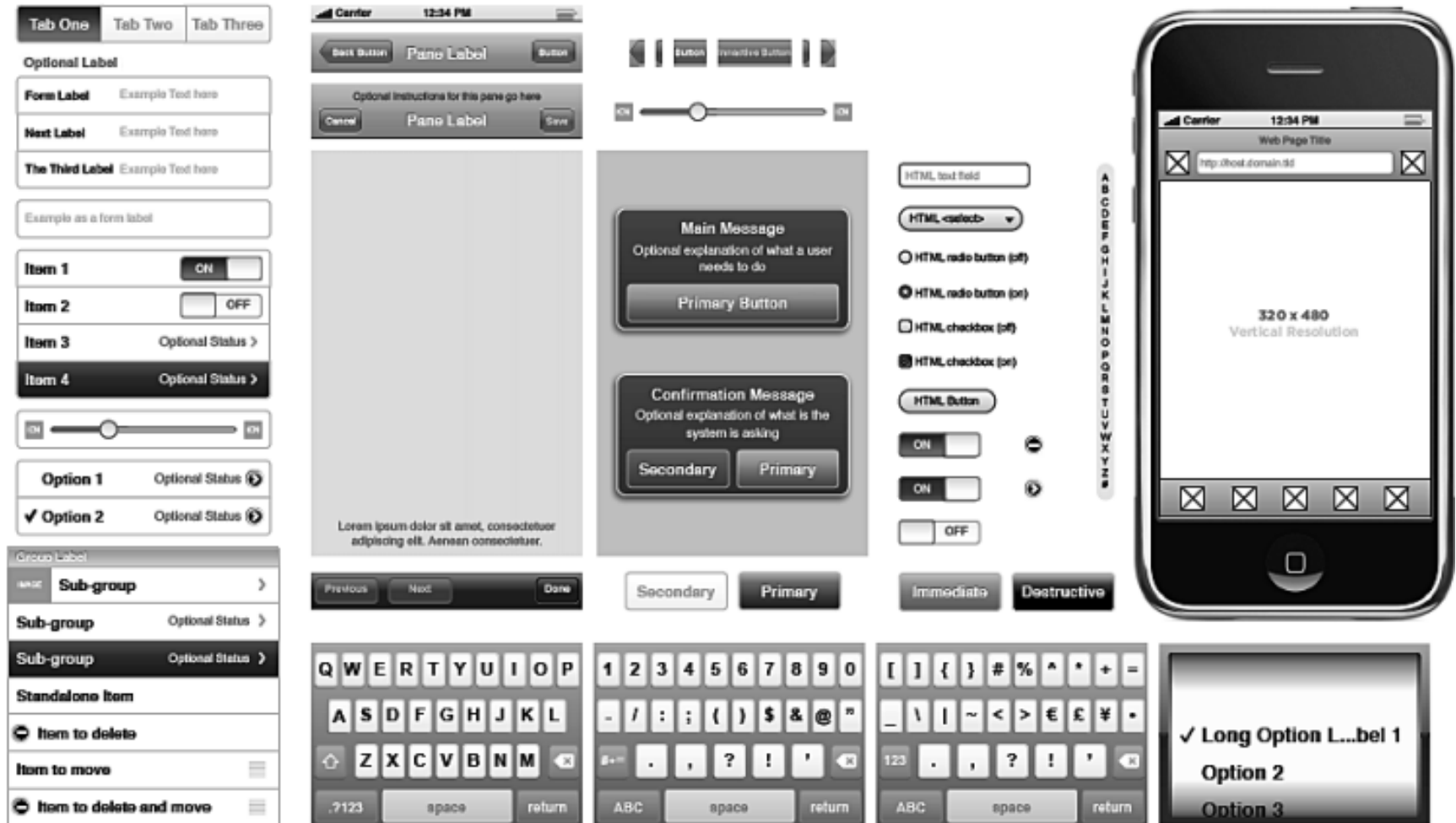
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# Prototipi ipertestuali (es. Powerpoint)



# Stencil per prototipi ipertestuali





# La grammatica dell'interfaccia

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## ▶ Information architecture

- ▶ Organizzazione delle informazioni

## ▶ Layout

- ▶ Organizzazione degli spazi
- ▶ Ogni spazio ha una valenza informativa specifica (“cosa” contiene?)
- ▶ Ogni spazio ha una valenza funzionale specifica (“a che cosa” serve?)

## ▶ Interaction

- ▶ Quali tecniche offro all'utente per interagire con i dati?
- ▶ Quali widget utilizzo?

# Interaction: cosa può fare l'utente?

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- ▶ Leggere, visualizzare (testi, immagini, ...)
- ▶ Analizzare (elenchi, tabelle, grafici, ...)
- ▶ Inserire (testo, numeri, date, ...)
- ▶ Scegliere (da elenchi, liste, ...)
- ▶ Ricercare (partendo da criteri)
- ▶ Filtrare (su elenchi esistenti)
- ▶ Confermare (ok, annulla, inserisci, elimina, ...)
- ▶ Navigare (slideshow, paginazione, gruppi, tabs, ...)
- ▶ Selezionare (uno o più elementi, parti di testo, ...)
- ▶ Spostare (drag, swipe, ...)

# Controls / Widgets

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- ▶ **Button**
- ▶ **Text (but also numbers, dates, ...)**
  - ▶ Single line / multiple lines
  - ▶ Display only / editable
- ▶ **Radio buttons**
- ▶ **Check box**
- ▶ **List box**
  - ▶ Visible
  - ▶ Drop down
- ▶ **Combo box**

# Windows XP widgets

www.finndesign.fi

**FINNDESIGN**  
professional creativity

### Dynamic vs. Fixed Properties

- Map the following properties to system settings instead of coding fixed values:
  - Colours
  - Fonts
  - Regional settings
- Do not use dynamic text strings in control labels

### Shortcut Keys

Show shortcut key combinations in menus to support learning

- Ctrl+A Select All
- Ctrl+C Copy
- Ctrl+F Find
- Ctrl+N New
- Ctrl+O Open
- Ctrl+P Print
- Ctrl+S Save
- Ctrl+V Paste
- Ctrl+X Cut
- Ctrl+Z Undo
- ESC Cancel
- F1 Contextual Help

### Reading Direction

- User's task flow should follow normal reading direction
- In right-to-left languages layout may have to be mirrored

### Focus Order

- Input focus movement by the TAB key should follow the reading direction
- and the user's task flow
- and the process workflow

### Alignment

- By default, use left-alignment for the layout of controls
- Command buttons are right-aligned

### Colours

- Map all colours to system colours
- Fixed colours may have contrast problems, if the user changes Windows colour theme
- Colour should never be the only way to convey information

### System font

- It is recommended to use the system font (default GUI font) instead of any named font
- No italics, no different sizes

### Command buttons

- Default size in Visual Studio: 75 x 23 pixels
- Use this size as the minimum size
- Remember ellipsis (...)

### Option buttons

- After I change display settings:
  - Restart the computer before
  - Apply the new display settin
  - Ask me before applying the
- One is always selected
- Layout of one set is always a vertical stack

### List boxes

- Make it wide enough to show large enough portion of each choice
- Avoid using horizontal scrollbar

### Dropdown listboxes

- Width should match other dropdown, text or spinboxes in the same group
- List shows a minimum of 3 and maximum of 8 choices

### Text fields

- Background color indicates, if the field is for input or output
- Single line text field width should reflect the expected string length
- Grids of text boxes should have equal lengths

### Toolbars

- Place controls in a task-based order
- Group toolbar controls in a logical way

### Rescaling

- Primary windows should be designed rescalable
- Consider window layout during rescale
- Define minimum size and design a usable layout for that size
- Define, which controls move or stretch in a rescale by appropriate Anchor and Dock properties
- Design good default sizes for user-resizable elements

### Message Boxes

- Centre-aligned at the bottom

### Toolbar buttons

- Text label is recommended with toolbar buttons

### Statusbar

- Avoid putting interactive controls in the statusbar

### Menus

- Unavailable items must not be hidden

### Progress Indicators

- 0 -> 0.5 second response time: no indicator
- 0.5 -> 5 seconds: Hourglass pointer
- 5 -> n seconds: Progress bar
- If the progress cannot be monitored, use a continuously rotating animation

### Images, Icons and Animations

- Use place-holder files until final graphics are available
- Locations are based on reserved area (boarding bowl), not visual content

### Common Dropdown Menus

- Application-specific menus go between View and Window menus

### Taskbar Status Area

- Contains status icons with:
  - Tooltip for explanation
  - Popup menu for actions
  - Double-click for default action
  - Balloon tip for notification
- Use only to notify user, when he is working with another application

### Sliders

- Best for setting only on approximate relative value between extremes
- Allow additional keyboard control
- Typically up and right arrow increases by one
- Shift + up or right arrow increases by 10

### Tabs

- Keep the number of tabs low to avoid tab label truncation
- Avoid multiple lines of tabs

### Dialog boxes

- Leave 14 pixels between:
  - Window edges and contents
  - Tabbed page edges and contents
  - Group Box edges and contents
  - Unrelated controls
  - Paragraphs of text
- Leave 6 pixels between:
  - Related controls (controls forming a group)
  - Command buttons stacked on in a row
  - Text label and its associated control
- Dialog buttons should have positive action first (OK, Apply, Cancel)

### Column headings

Font Name	Filename	Size	Modified	Attribu...
Aachen Bold	orb_...pfm	32K	16.10.1997 11:08	A
Acasien Ornaments	avor_...pfm	68K	16.10.1997 11:48	A
Adventure Normal (Tr...				
Alderbrook Parkes (Tr...				

- Each column heading should have a label
- Alignment: numerical values to the right, text to the left.

### Grouping

- Do not use Group Box with only one group
- Consider other grouping options
- Separator lines, extra margins, indentations
- Make the scope of controls clear to the user
- Some controls affect only another control
- Some controls affect the whole process

### Text Alignment

- Left-alignment is default in Western languages
- Numerical values in lists are right-aligned (Integers, dates) or aligned by the decimal point
- When showing numerical data, make sure that the font has equal-width numerals

### Punctuation

- Add ellipsis (...) in menu items and buttons that require further input before the desired action
- Add colon (:) to the labels of controls
- Not in buttons, tabs or group boxes

### Split Windows

- Save the split pane state, when the window is closed or minimized

### Internationalisation

- Applications must be localisable without layout redesign
- Reserve at least 50% more space than required for English
- Reserve space for extra lines of text, too
- Placing the label above the control allows more horizontal space for the control and its label
- Avoid language-dependent layout
- E.g. using controls inside a sentence

### Selection and Activity

- Only one active selection set at a time

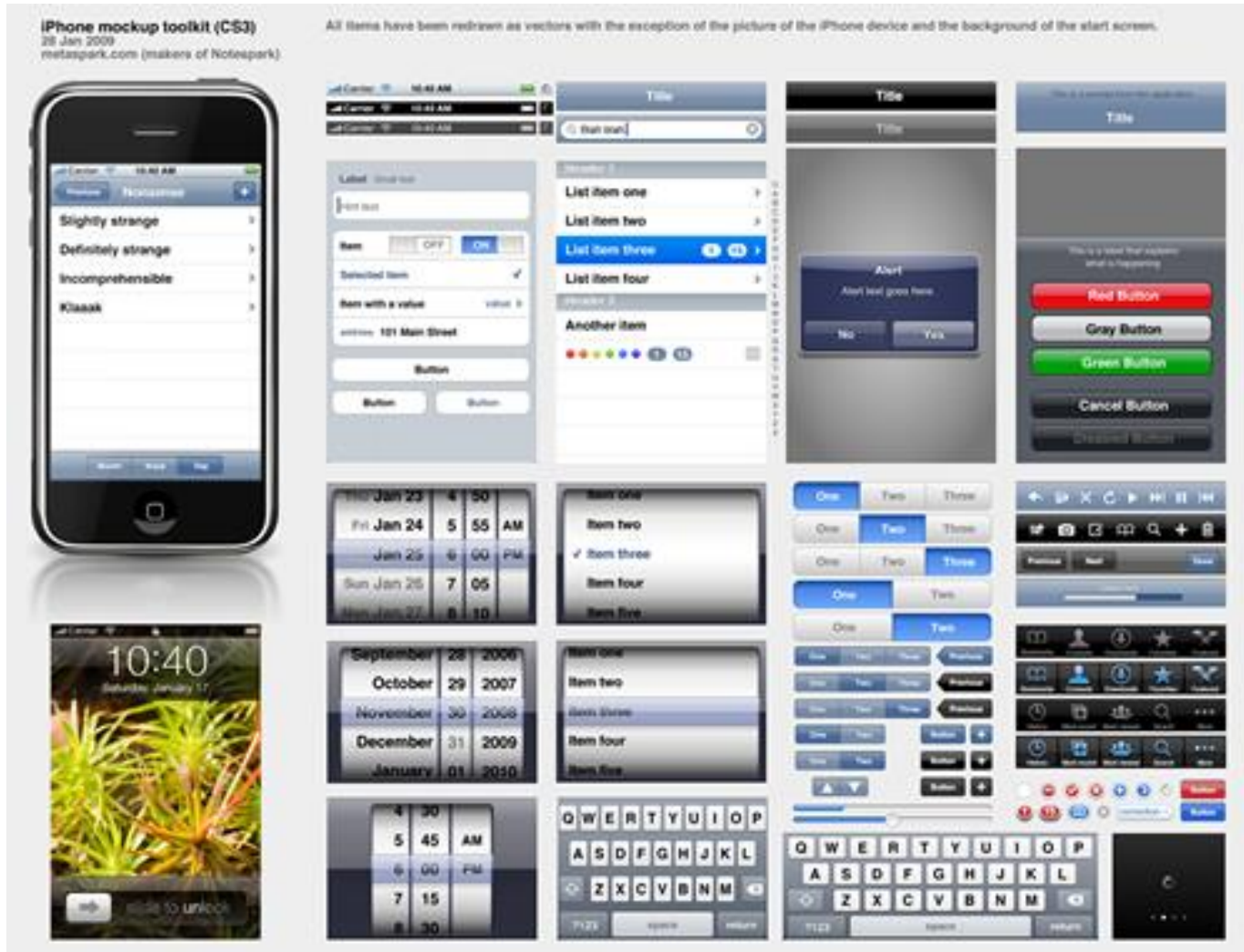
## Windows XP GUI Controls and Layout Quick Reference Guide

All values are in pixels.

# JavaFX widgets



# iPhone widgets



# Android widgets





POLITECNICO  
DI TORINO



e-Lite



# Mockup design guidelines

Sistemi Informativi Aziendali – A.A. 2012/2013



# Problematiche del progetto

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- ▶ Come costruisco la navigazione?
- ▶ Quale ordine di lettura dare?
- ▶ Che elementi visualizzare?

# Metriche di Usabilità

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- ▶ Facilità di apprendimento
- ▶ Efficienza d'uso
- ▶ Memorizzazione
- ▶ Frequenza e gravità di errori
- ▶ Soddisfazione

# Choosing controls

---

<b>TASK</b>	<b>BEST CONTROL</b>	<b>IF SCREEN SPACE CONSTRAINTS EXIST</b>
Mutually Exclusive	Radio Buttons	Drop-Down/Pop-Up List Box
Not Mutually Exclusive	Check Boxes	Multiple-Selection List Box
Select or Type a Value Text Entry Field	Radio Buttons with "Other"	Drop-DownComboBox
Setting a Value within a Range	Spin Button	TextBox

From Johnsgard et al. (1995).

1. IF:

USE:

- Mutually exclusive alternatives.
- Discrete data.
- Best represented verbally.
- Very limited in number (2 to 8).

AND:

- Typed entry is never necessary.
- Content can never change.
- Adequate screen space is available.

RadioButtons

Choose:

- option 1
- option 2
- option 3
- option 4

Color:

- Red
- Yellow
- Green
- Blue

OR:

- Typed entry is never necessary.
- Content can never change.
- Adequate screen space is not available.

Drop-Down/Pop-Up List Box



OR:

- Typed entry may be necessary.
- Content can change.
- Adequate screen space is available.

Combo box

Font Style:

- Regular
- Regular
- Italic
- Bold
- Bold Italic

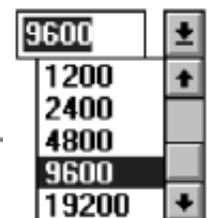
Size:

- 8
- 8
- 10
- 12
- 14
- 18

OR:

- Typed entry may be necessary.
- Content can change.
- Adequate screen space is not available.

Drop-Down/Pop-Up Combo Box



---

2. *IF:*

---

*USE:*

---

- Mutually exclusive alternatives.
  - Discrete data.
  - Best represented verbally.
  - Potentially large in number (9 or more).
- 

*AND:*

---

- Typed entry is never necessary.
  - Content can never change.
  - Adequate screen space is available.
- 

Single-Selection List Box

---

*OR:*

---

- Typed entry is never necessary.
  - Content can never change.
  - Adequate screen space is not available.
- 

Drop-Down/Pop-Up  
List Box

---

*OR:*

---

- Typed entry may be necessary.
  - Content can change.
  - Adequate screen space is available.
- 

Combo Box

---

*OR:*

---

- Typed entry may be necessary.
  - Content can change.
  - Adequate screen space is not available.
- 

Drop-down/Pop-up  
Combo Box

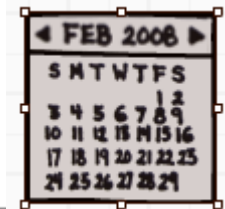
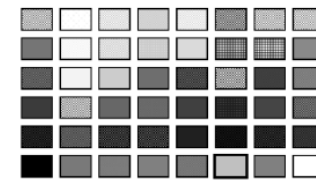
---

### 3. IF:

- Mutually exclusive alternatives.
- Discrete data.
- Best represented graphically.
- Content rarely changes.
- Small or large number of items.

### USE:

#### Palette



### 4. IF:

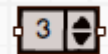
- Mutually exclusive alternatives.
- Not frequently selected.
- Content does not change.
- Well-known, easily remembered data.
- Predictable, consecutive data.
- Typed entry sometimes desirable.

### USE:

### AND:

- Adequate screen space is not available.

#### Spin Box



### OR:

- Adequate screen space is available.

#### Combo Box

---

*5. IF:*

---

- Mutually exclusive alternatives.
  - Continuous data with a limited range of settings.
  - Value increases/decreases in a well-known, predictable way.
  - Spatial representation enhances comprehension.
- 

*USE:*

Slider



---

*6. IF:*

---

- Nonexclusive alternatives.
  - Discrete data.
  - Best represented verbally.
  - Typed entry is never necessary.
  - Content can never change.
  - Adequate screen space is available.
- 

*USE:*

---

*AND:*

---

- Very limited in number (2 to 8).
- 

Check Boxes

- Bold
- Italic
- Underline

---

*OR:*

---

- Potentially large in number (9 or more).
- 

Multiple-Selection List Box

---

# Grouping

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- ▶ Border
- ▶ Tabs
- ▶ Accordion
- ▶ Pop-up
- ▶ Menu

DOCUMENT	
Justification:	<input checked="" type="radio"/> None <input type="radio"/> Left <input type="radio"/> Center <input type="radio"/> Right
Contents:	<input checked="" type="checkbox"/> Preface <input checked="" type="checkbox"/> Illustrations <input checked="" type="checkbox"/> Index <input checked="" type="checkbox"/> Bibliography

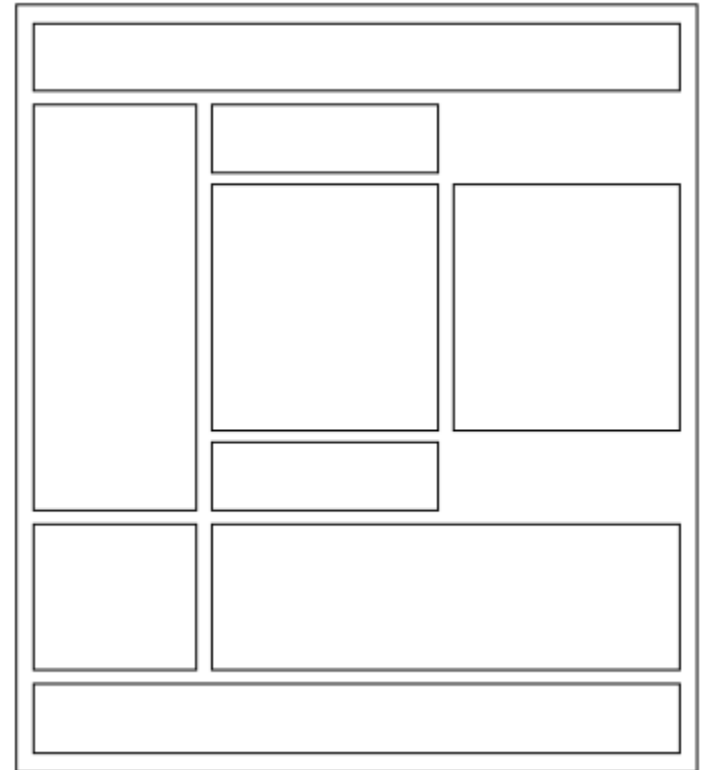
AUTHOR	
Name:	<input type="text"/>
Telephone:	<input type="text"/>



# Layout

---

- ▶ Gerarchia degli spazi
- ▶ Riconoscibilità delle funzioni
- ▶ Spazi
- ▶ Include la navigazione
- ▶ “Scannable”
  
- ▶ Adattabile al dispositivo?



# Use cases vs UI Mockups

---

- ▶ Use cases (normally) describe round-trips between the system and the user
  - ▶ System-to-user:
    - ▶ Some information to show (for the user to read/view)
    - ▶ A set of interactive controls
  - ▶ User-to-system
    - ▶ Some specific data (provided by means of interaction with the controls)
- ▶ **Main** requirement: UI elements should be consistent with the exchanged data
- ▶ Secondary requirements: UI elements should be used correctly, maximizing usability



# Esempio

## PiyoTravel

Clients

Elenco

Crea Nuovo

Last Added

Travels

Location

Mezzi

Accompagnatori

Calendario

leaving!

# Esempio

## PiyoTravel

Clienti | Viaggi

search

Gruppi ▾

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telefono 1       telefono 2

telefono 3

---

indirizzo

---

note       Gruppo

---

Stato fattura  ON

# Esempio

## PiyoTravel

Clienti Viaggi

Location mezzi accompagnatori calendario

search A B C D E

Nome Viaggio

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◀ FEB 2008 ▶						
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10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	

# Look & Feel



# Pattern: alcuni esempi

---

- ▶ Menu' di navigazione
- ▶ Login e registrazione
- ▶ Search e pagine di risultati
- ▶ Paging o scrolling
- ▶ Date Picker o Compilazione
- ▶ Call for action



# Pattern References

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- ▶ <http://quince.infragistics.com/>
- ▶ <http://interface.fh-potsdam.de/infodesignpatterns/patterns.php>
- ▶ <http://www.welie.com/patterns/index.php>
- ▶ <http://patterntap.com/>

# Best Practice: alcuni esempi

---

- ▶ Gestione dello spazio: all in one window, scrolling, ridimensionamento
- ▶ Selezione degli oggetti: selezioni multiple da liste, drag&drop, comandi da tastiera
- ▶ Messaggi di errore
- ▶ Pannelli: accordion, modal panel (LightBox)
- ▶ Wizard






# Riferimenti e fonti

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- ▶ Facile da Usare - Una Moderna Introduzione all'Ingegneria dell'Usabilità, R. Polillo,  
<http://www.slideshare.net/rpolillo/facile-da-usare-una-moderna-introduzione-allingegneria-dellusabilit>
- ▶ The Essential Guide to User Interface Design: An Introduction to GUI Design Principles and Techniques , W.O. Galitz, Wiley, 2007, ISBN: 978-0-470-05342-3
- ▶ <http://www.slideshare.net/guestc86d7a4/progettazione-di-interfaccie-e-tassonomia>

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