Designing the User eXperience

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SoftEng
http://softeng.polito.it

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Licensing Note

Acknowledgments

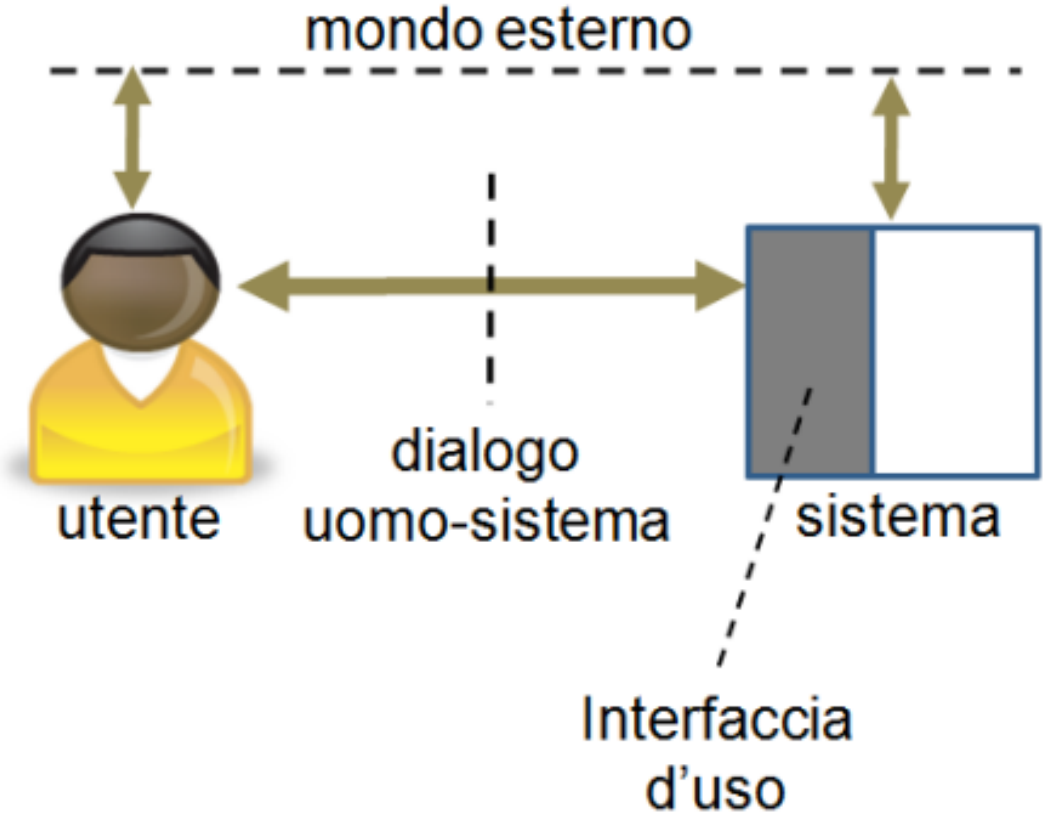
- This set of slides are derived from those authored by Prof. Fulvio Corno for previous issues of the course “Sistemi Informativi Aziendali” at Politecnico di Torino
- Many thanks to Fulvio for kindly sharing his materials

THE USER EXPERIENCE

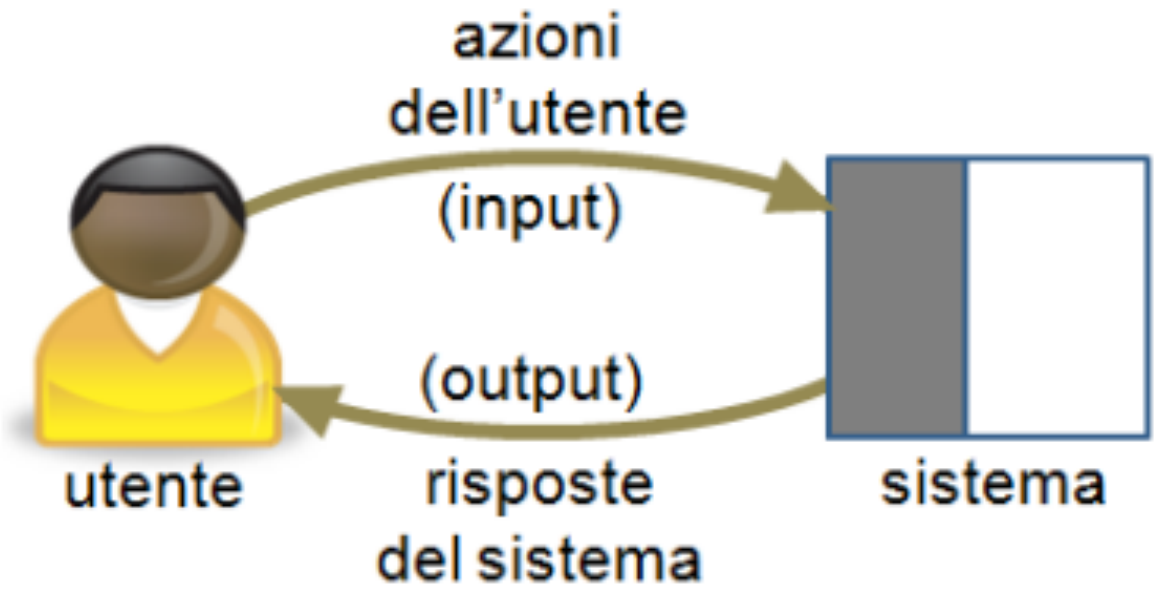
Goals

- Develop a user-centered design
- Define rules for the design development
- Integrate those rules into the Information System development cycle

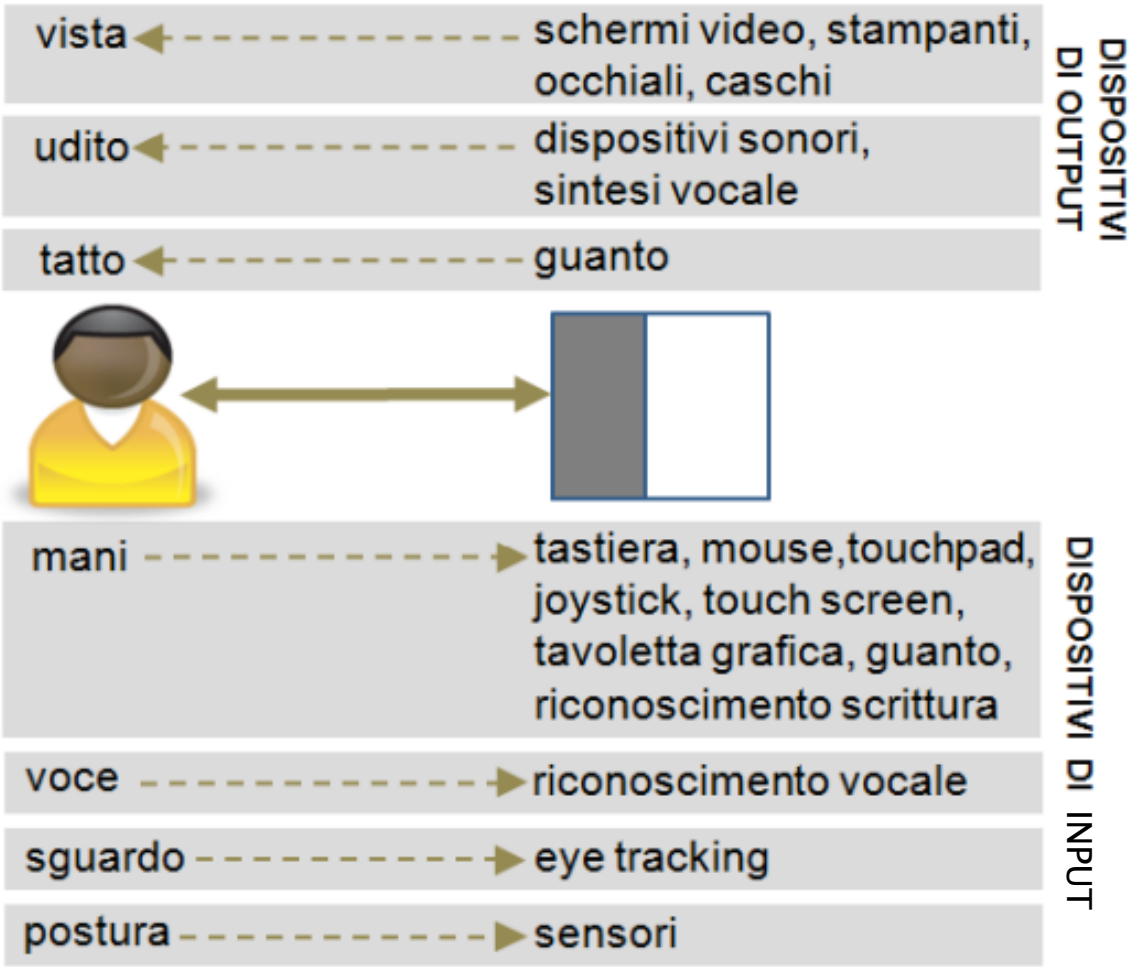
The UI Role


mondo esterno
utente
dialogo
uomo-sistema
sistema
Interfaccia
d'uso

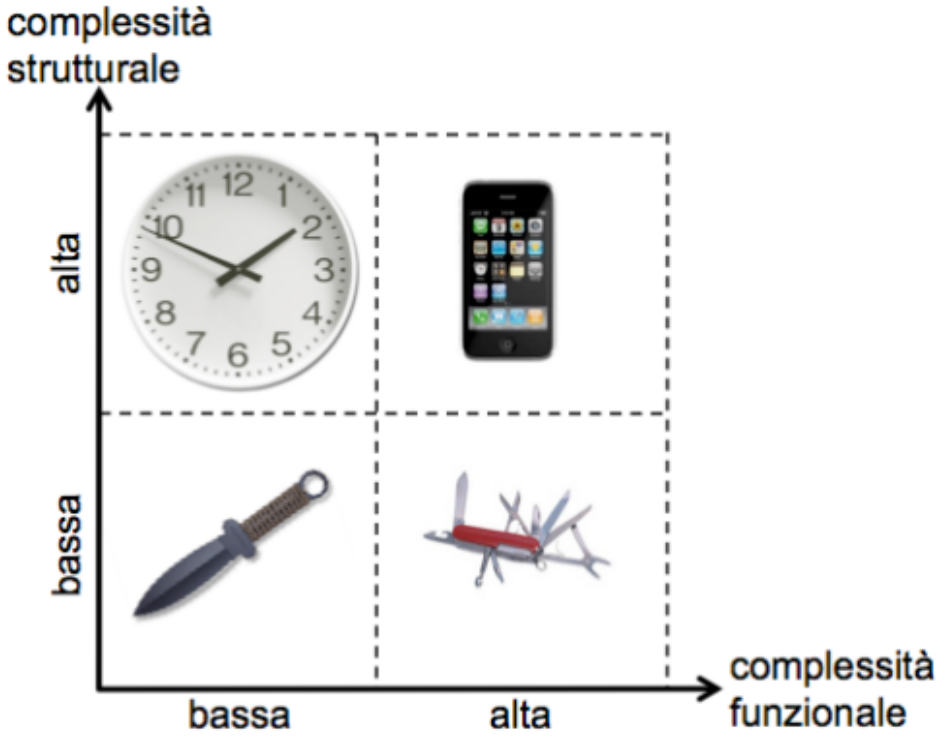
How


azioni
dell'utente
(input)
(output)
utente
risposte
del sistema
sistema

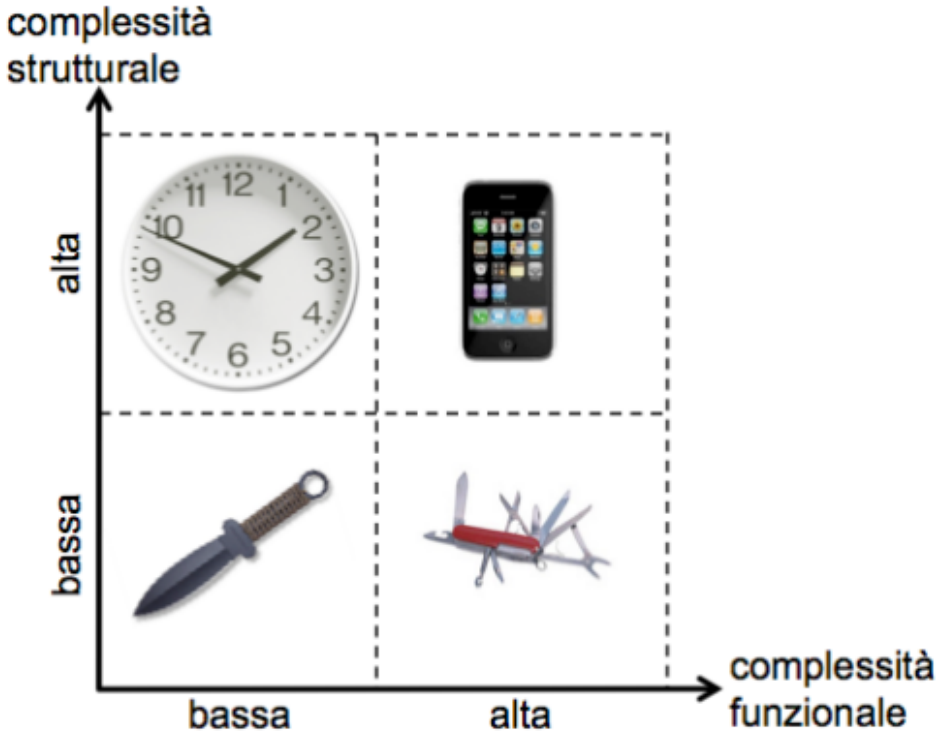
Senses and Tools

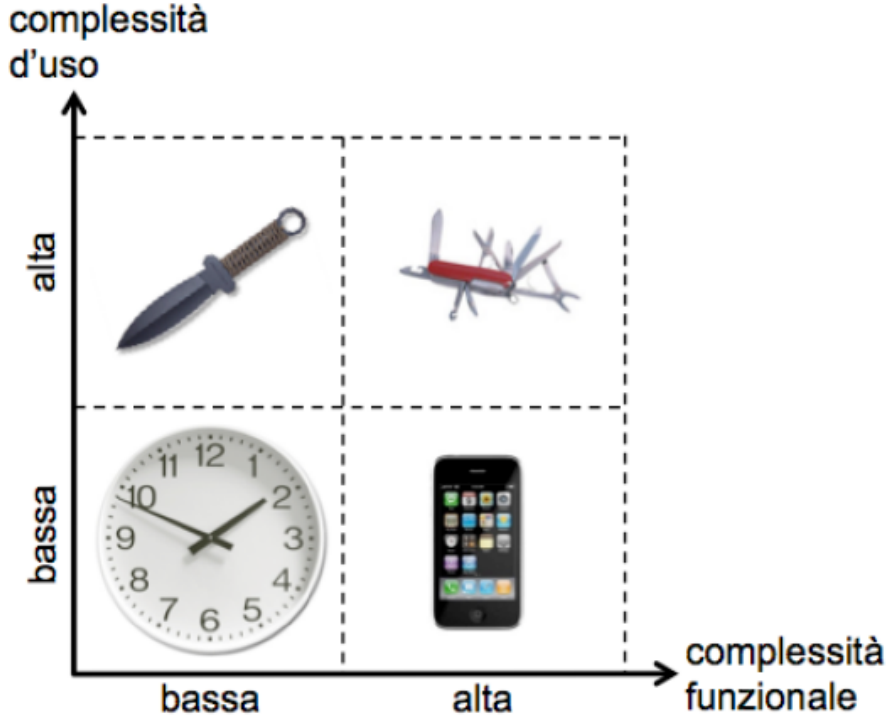


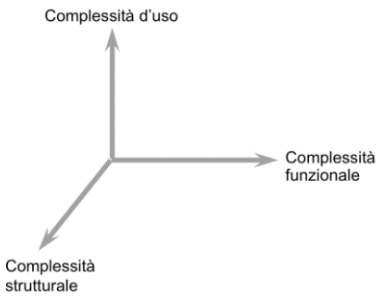
Levels of complexity



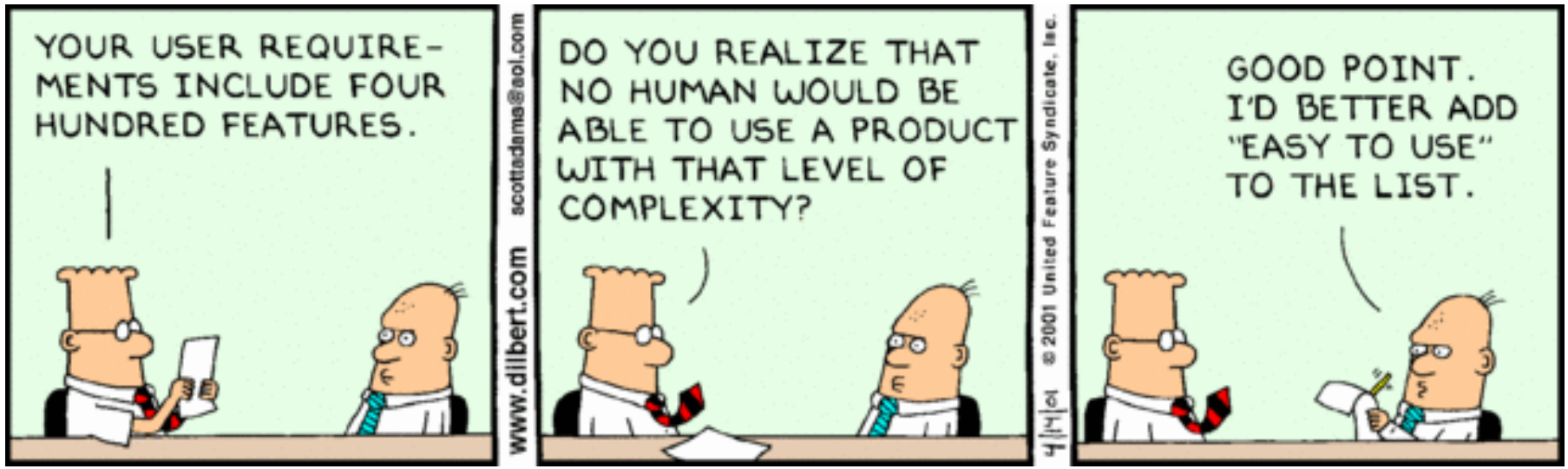
Levels of complexity







Complexity


YOUR USER REQUIREMENTS INCLUDE FOUR HUNDRED FEATURES.
DO YOU REALIZE THAT NO HUMAN WOULD BE ABLE TO USE A PRODUCT WITH THAT LEVEL OF COMPLEXITY?
GOOD POINT. I'D BETTER ADD "EASY TO USE" TO THE LIST.
www.dilbert.com scottadams@aol.com
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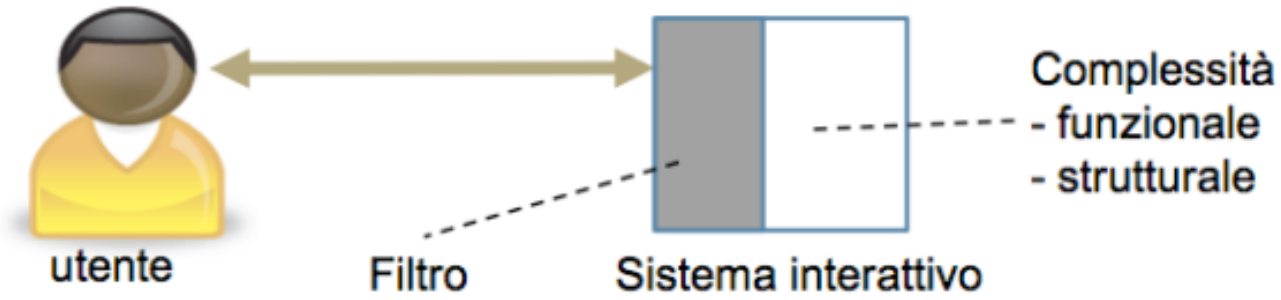
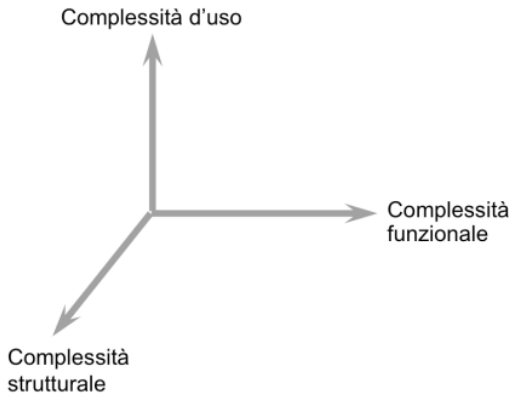
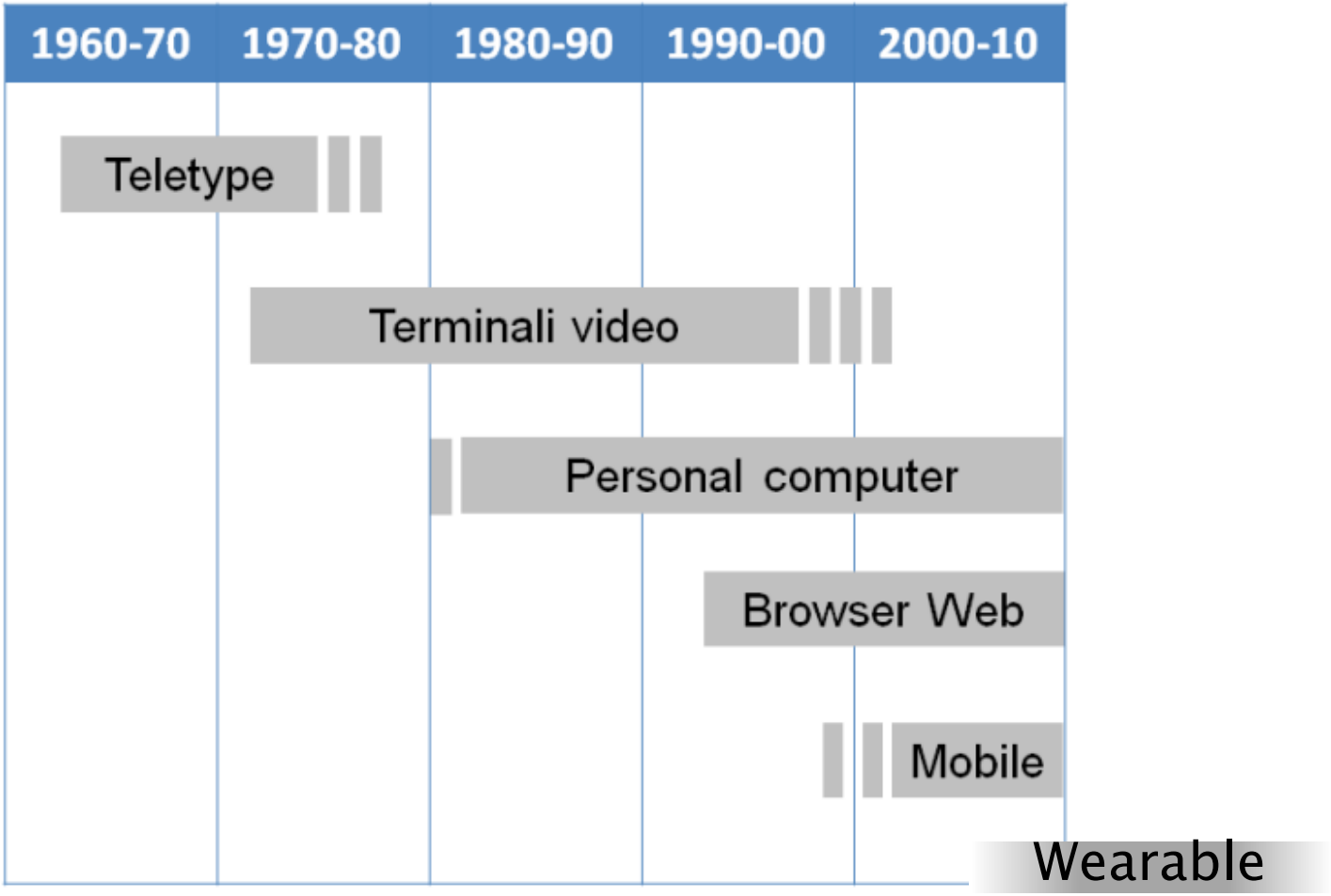
Usability Design

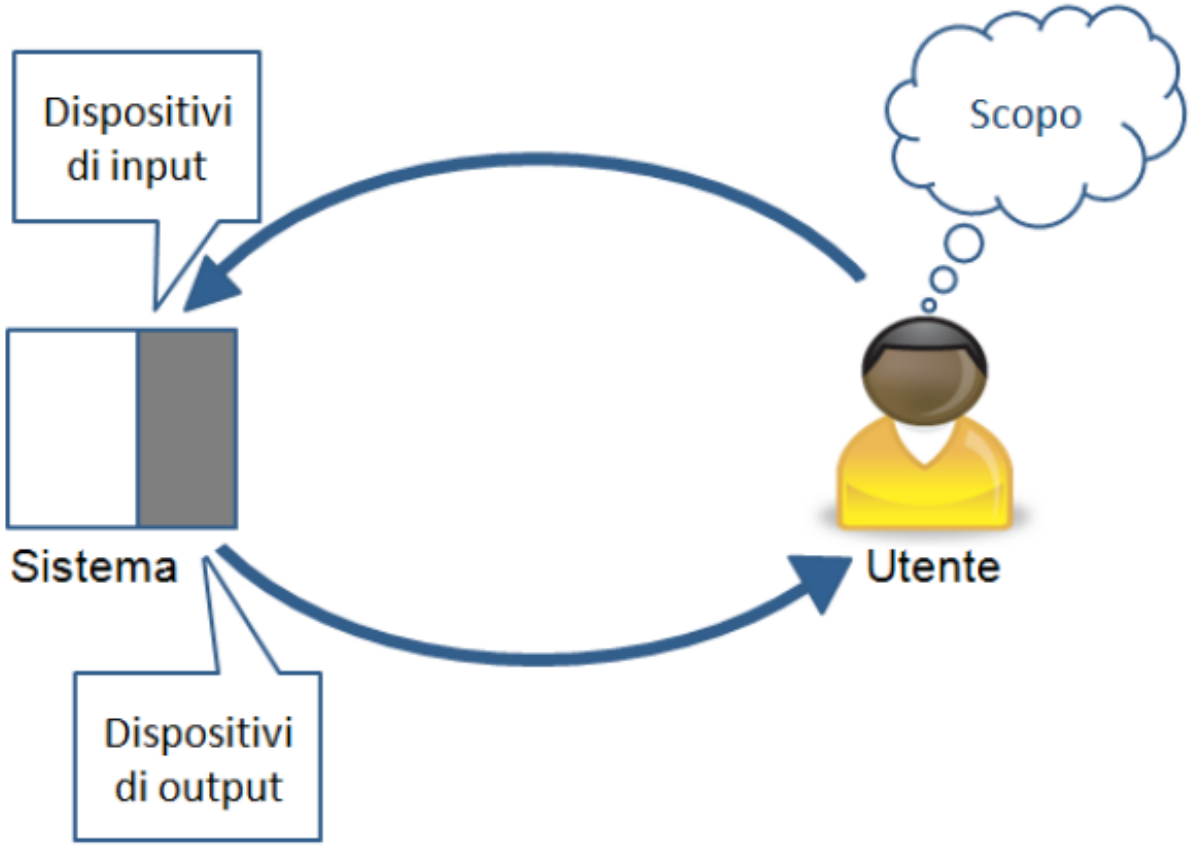




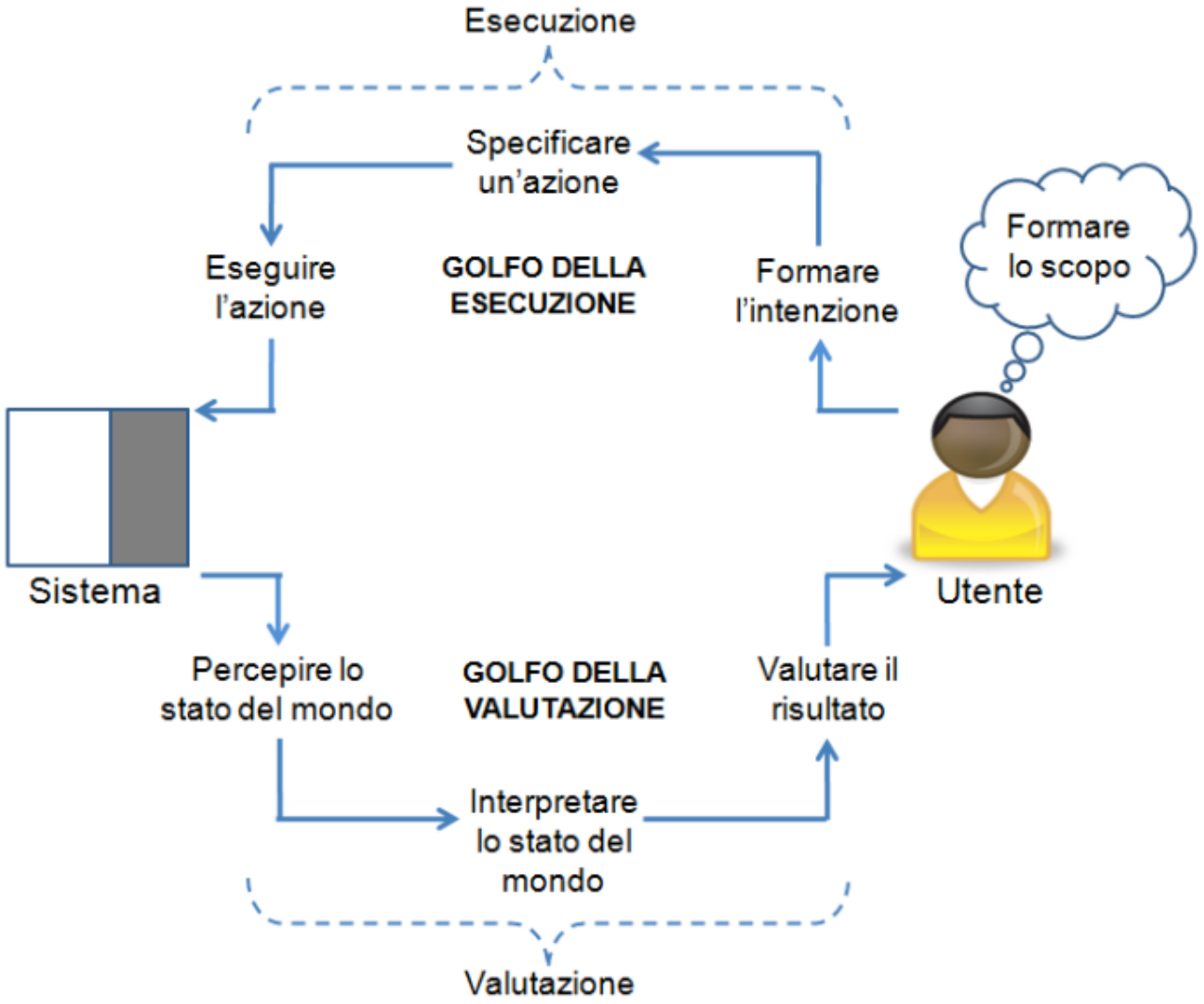
Interaction Technologies



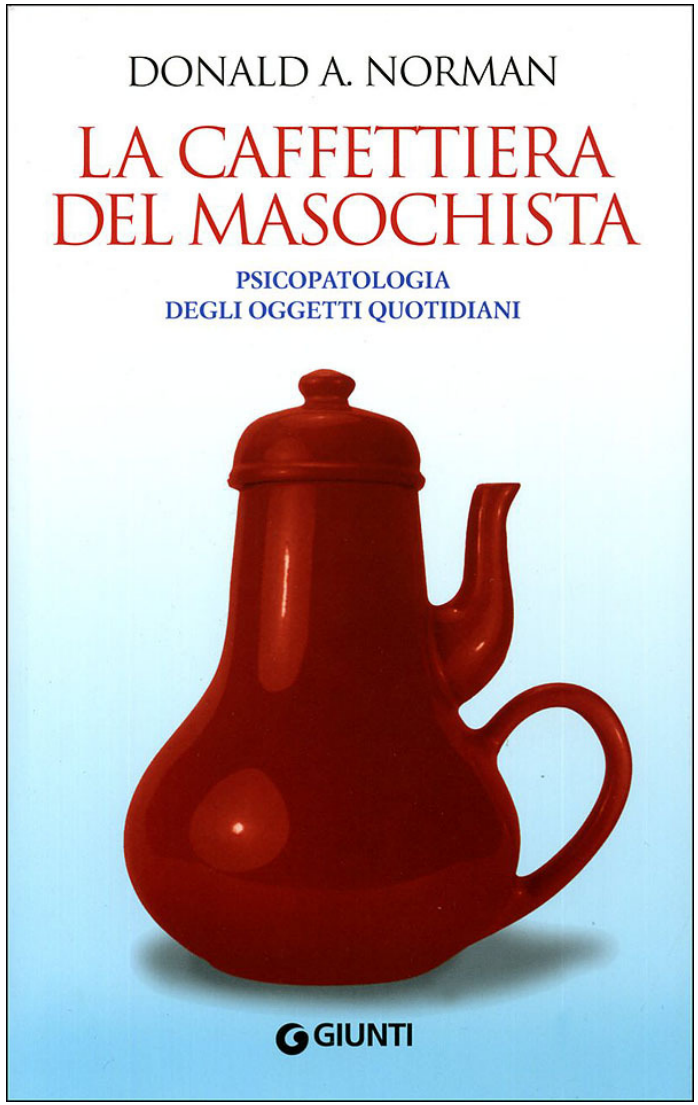
User goals


Dispositivi
di input
Scopo
Sistema
Utente
Dispositivi
di output

Norman's Model



Donald Norman



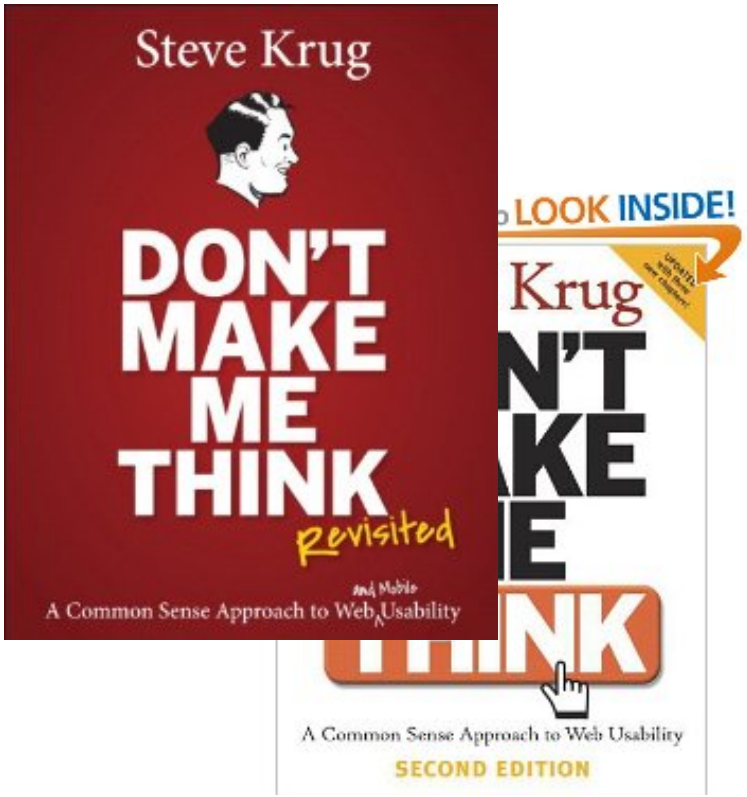
http://it.wikipedia.org/wiki/Donald_Norman

Nielsen Norman Group

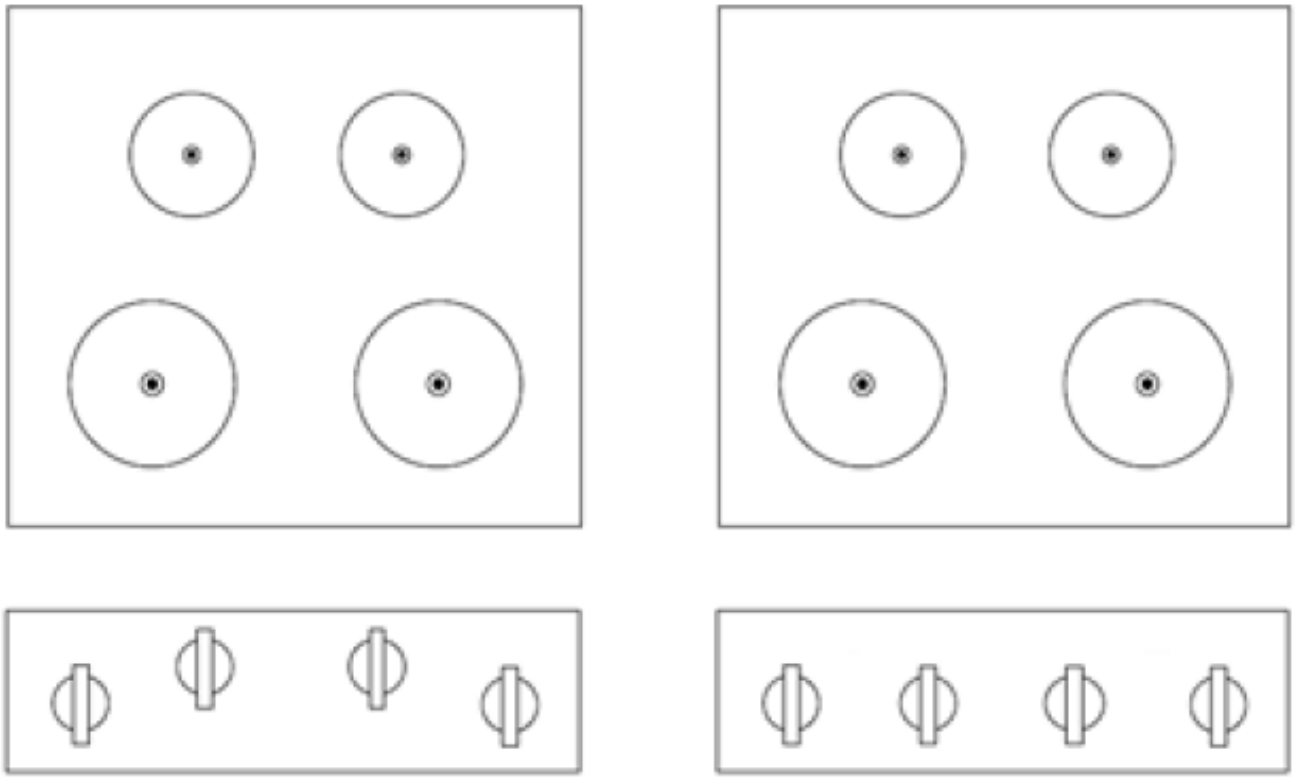
- Jakob Nielsen
- Co-founded with Don Norman
- http://www.nngroup.com/articles/

Don’t make me think

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



Affordance: stoves

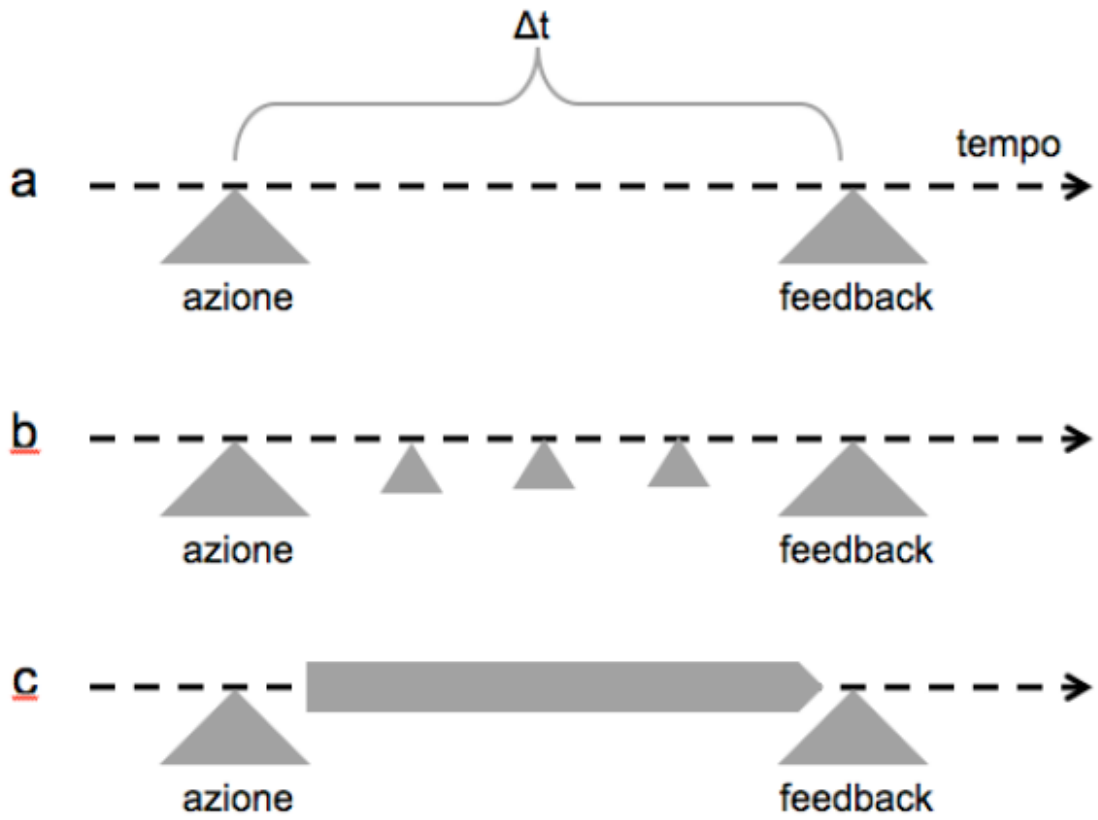


Affordance

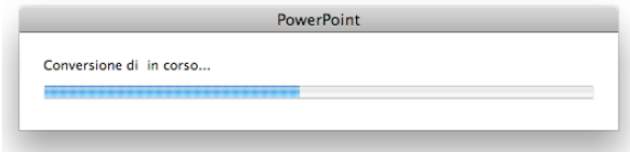

CDs/DVDs
PILES
BOMBETES
BOMBETES BAIX CONSUM
CARTUTXOS TINTA
ESPRAIS
Separar bé
no costa tant
Ajuntament de SantCugat


CDs/DVDs
PILES
BOMBETES
BOMBETES BAIX CONSUM
CARTUTXOS TINTA
MÒBILS I CARREGADORS
ESPRAIS
Separar

Feedback

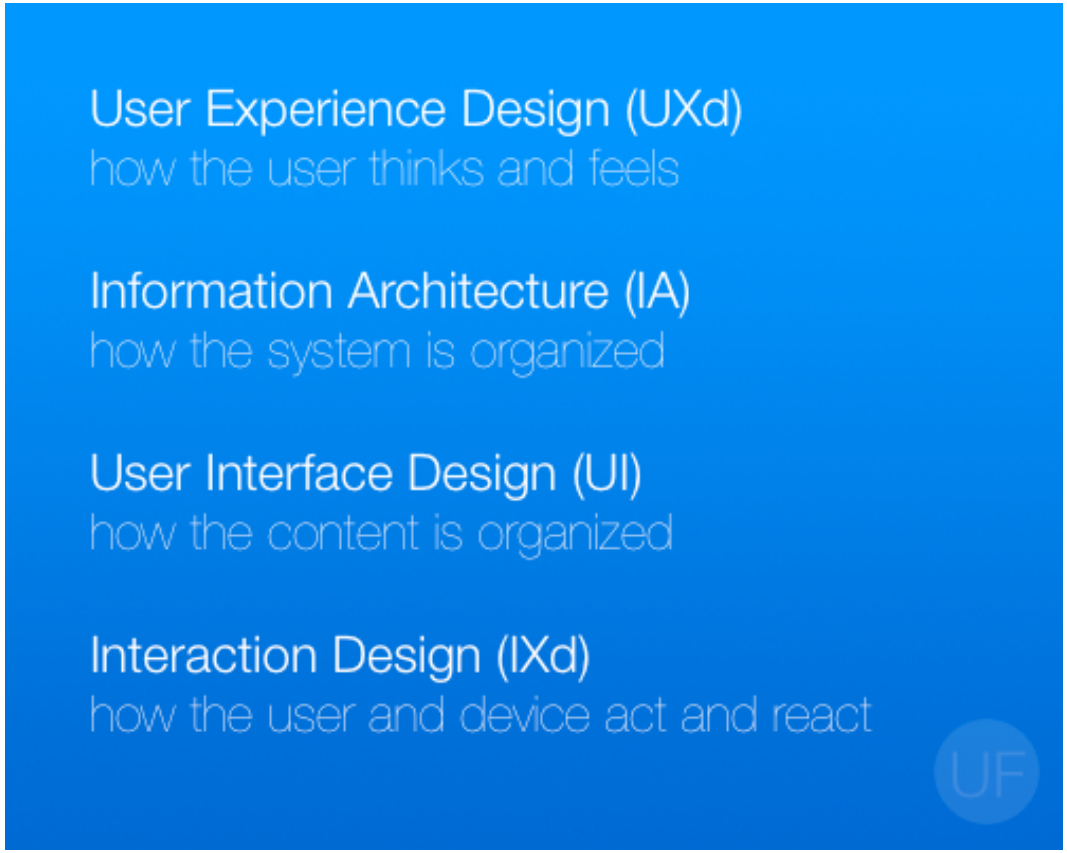

Δt
tempo
a
azione
feedback
b
azione
feedback
c
azione
feedback


loading
47 %

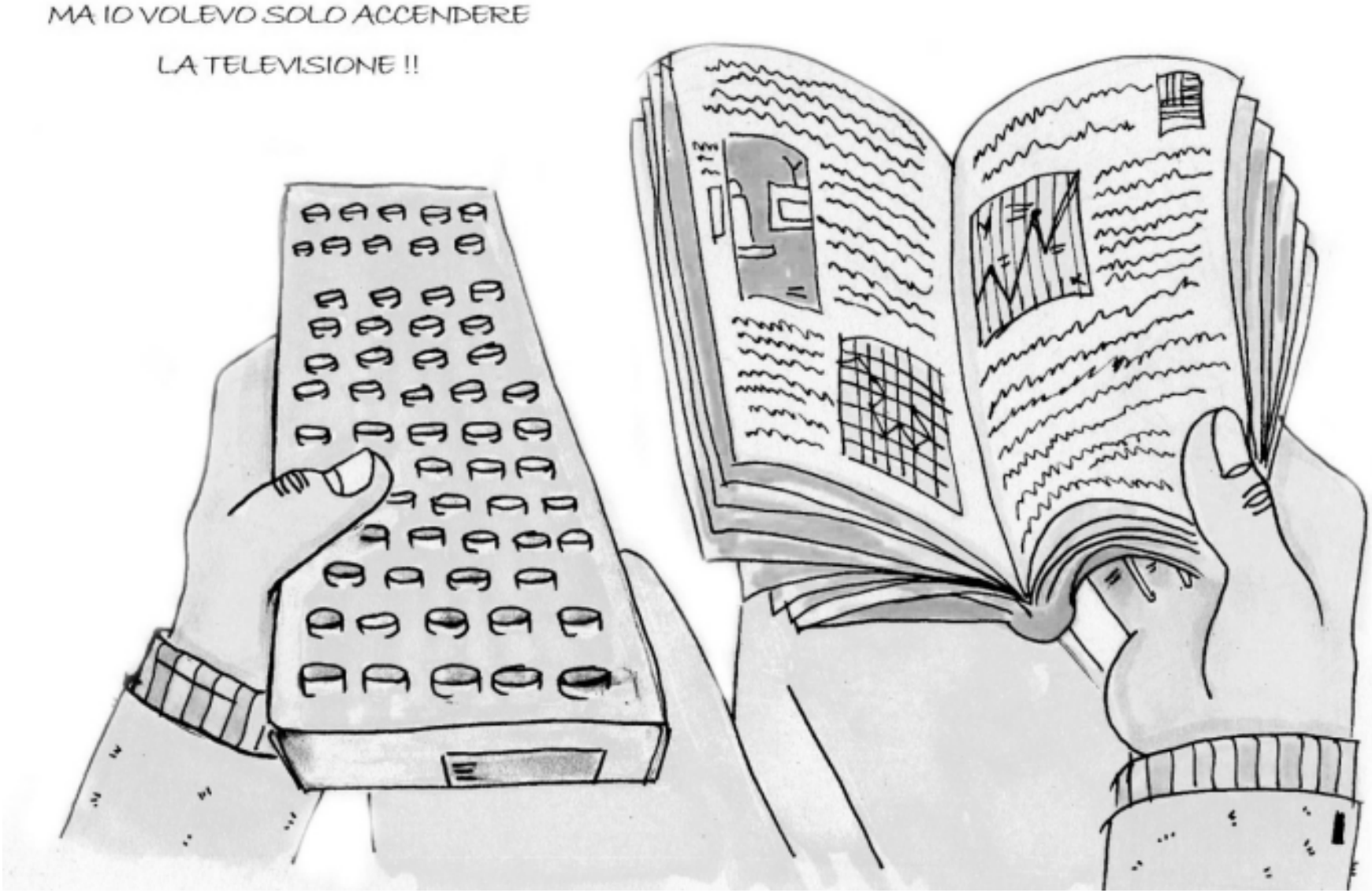

PowerPoint
Conversione di in corso...

UX Honeycomb

Involved Disciplines



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


MA IO VOLEVO SOLO ACCENDERE
LA TELEVISIONE !!

The Traditional Approach

The Traditional Approach

Es.: Lift

- Go to floor n
- Open / Close door
- Stop
- Trigger the Alarm

What features the system must provide to the user?
We design and implement them
(System-oriented design)

The New Approach

Es.: Lift

- Go to floor n
- Open / Close door
- Stop
- Trigger the Alarm

E.g.: Elevator

- Call the elevator
- Enter the elevator
- Select a floor
- Stop the elevator
- Calls for help
- Exit the elevator

what are the "use cases" of the user with respect to the system...
(User-oriented design)

The New Approach

E.g.: Elevator

- Call the elevator
- Enter the elevator
- Select a floor
- Stop the elevator
- Calls for help
- Exit the elevator

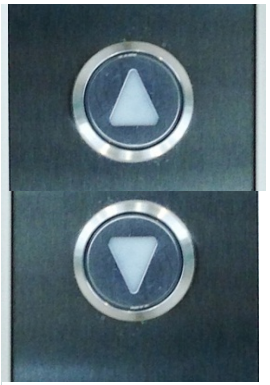
... and we design the interaction accordingly (Interaction Design)

Example: Another Elevator

Use Cases

- Call the elevator
  - to go down
  - to go up
- Enter the elevator

- Select a floor
- Stop the elevator
- Ask for help
- Open the doors
- Close the doors
- Exit the elevator

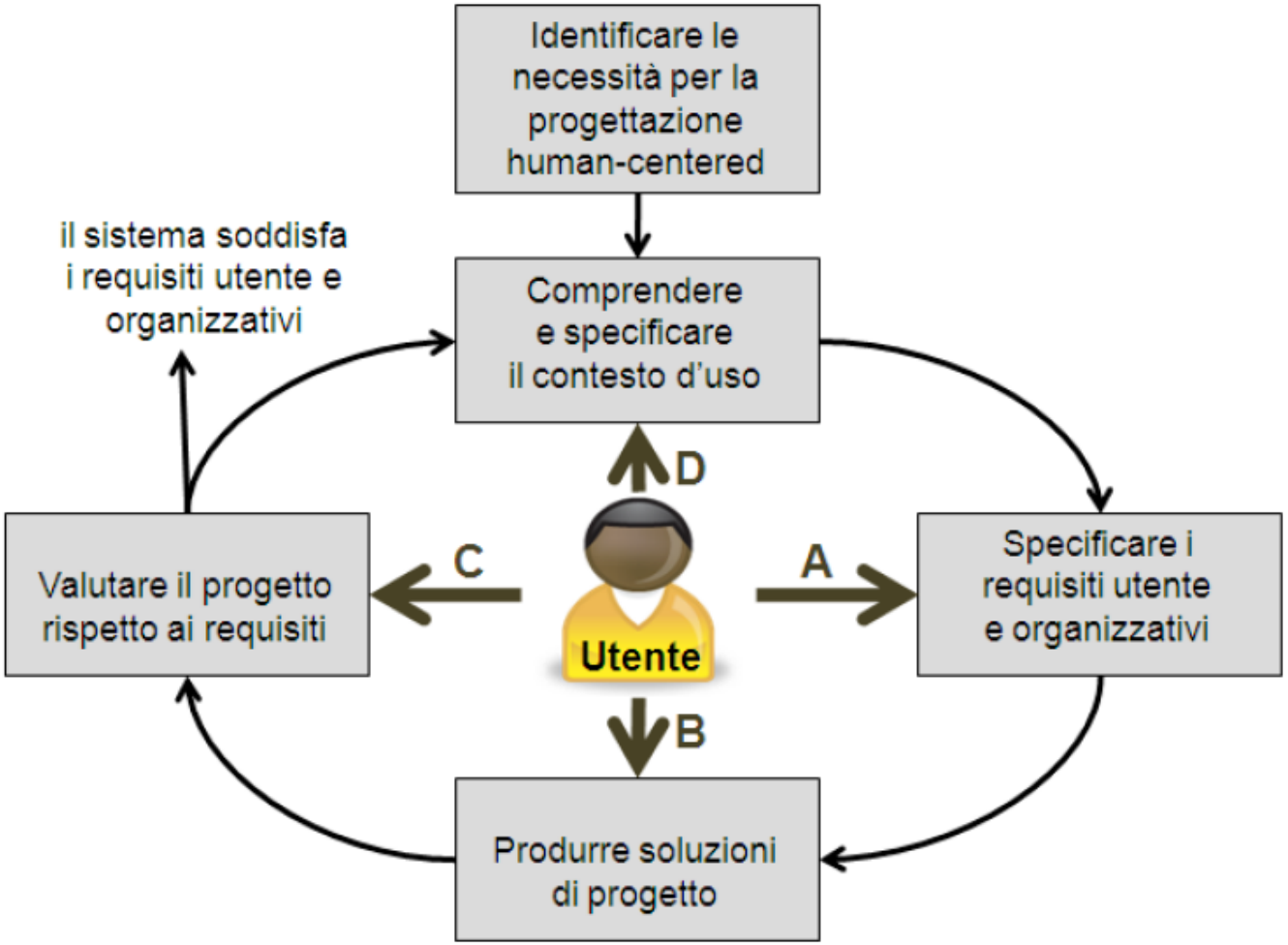


Outside

Inside

What…

Human Centered Design



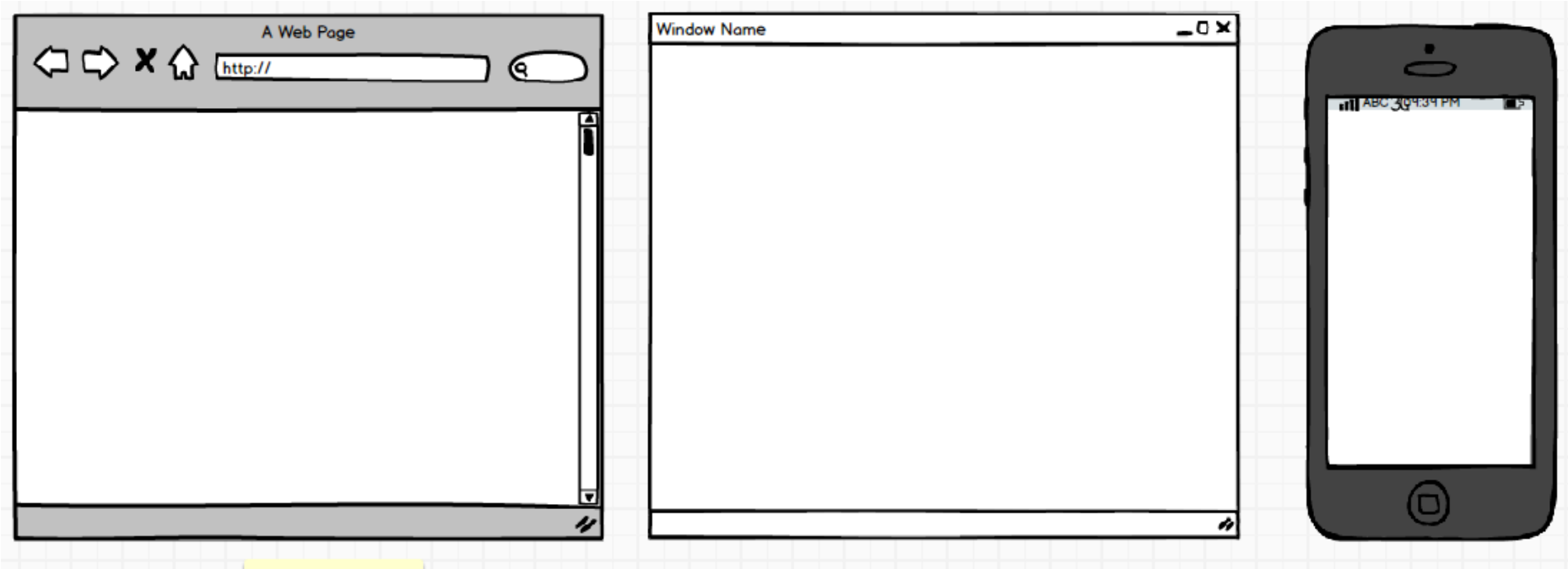
Define the requirements with the user

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)

Design Step

- Sketch
- Wireframes
- Static components
- Functional mockups

The Three Interfaces



Web Desktop Mobile

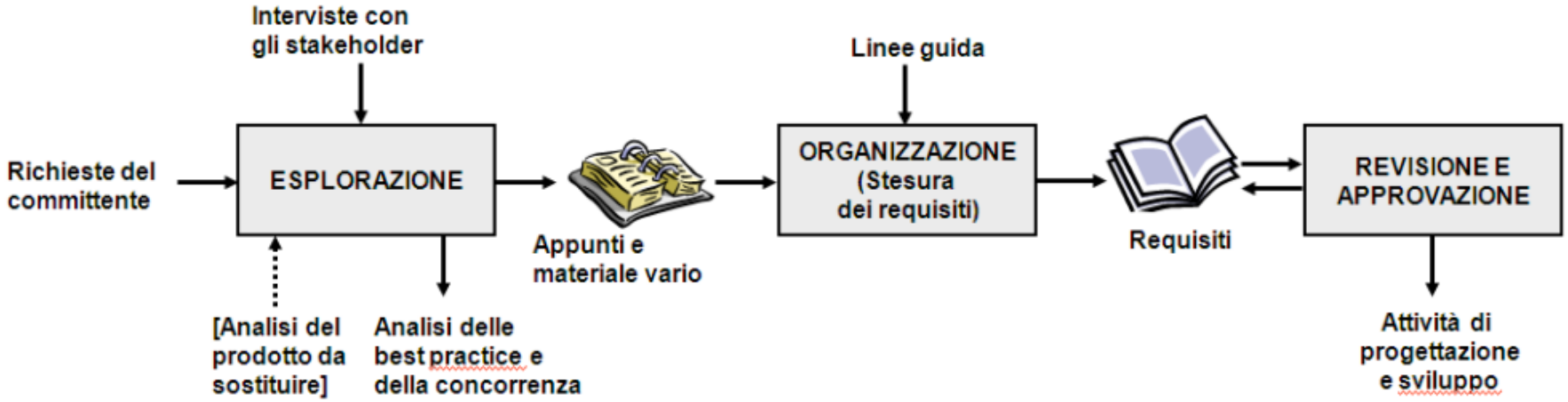
The project issues

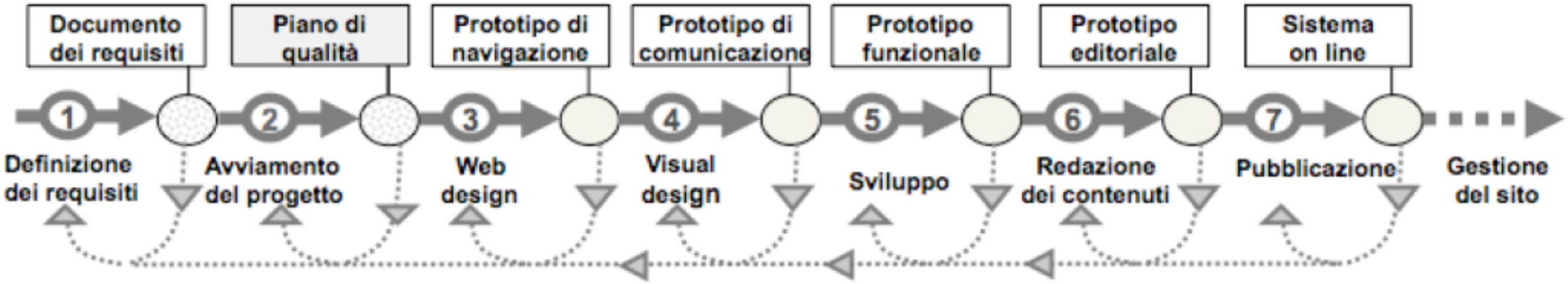
- How are the elements connected to each other
- How they will be perceived by the user
- What must have immediate visibility: fewer actions to achieve the goal

Prototypes

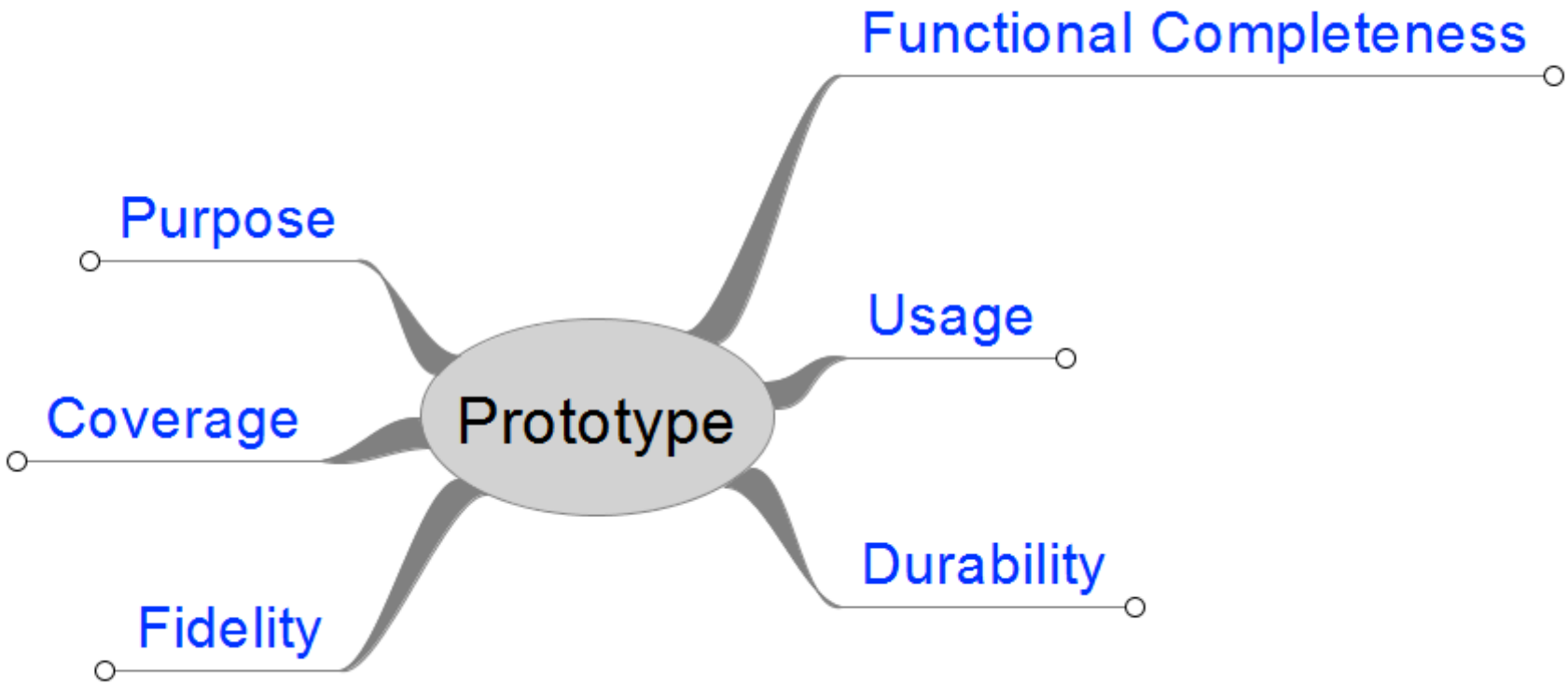
- An easily modified and extensible model (representation, simulation or demonstration) of a planned software system, likely including its interface and input/output functionality

Prototypes

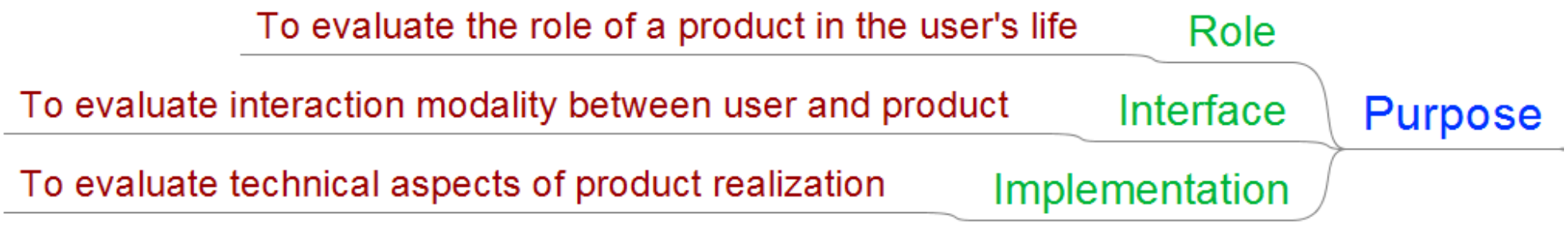

Interviste con gli stakeholder
Linee guida
Richieste del committente
ESPLORAZIONE
ORGANIZZAZIONE (Stesura dei requisiti)
REVISIONE E APPROVAZIONE
Appunti e materiale vario
Requisiti
[Analisi del prodotto da sostituire]
Analisi delle best practice e della concorrenza
Attività di progettazione e sviluppo


Documento dei requisiti
Piano di qualità
Prototipo di navigazione
Prototipo di comunicazione
Prototipo funzionale
Prototipo editoriale
Sistema on line
1
2
3
4
5
6
7
Definizione dei requisiti
Avviamento del progetto
Web design
Visual design
Sviluppo
Redazione dei contenuti
Pubblicazione
Gestione del sito

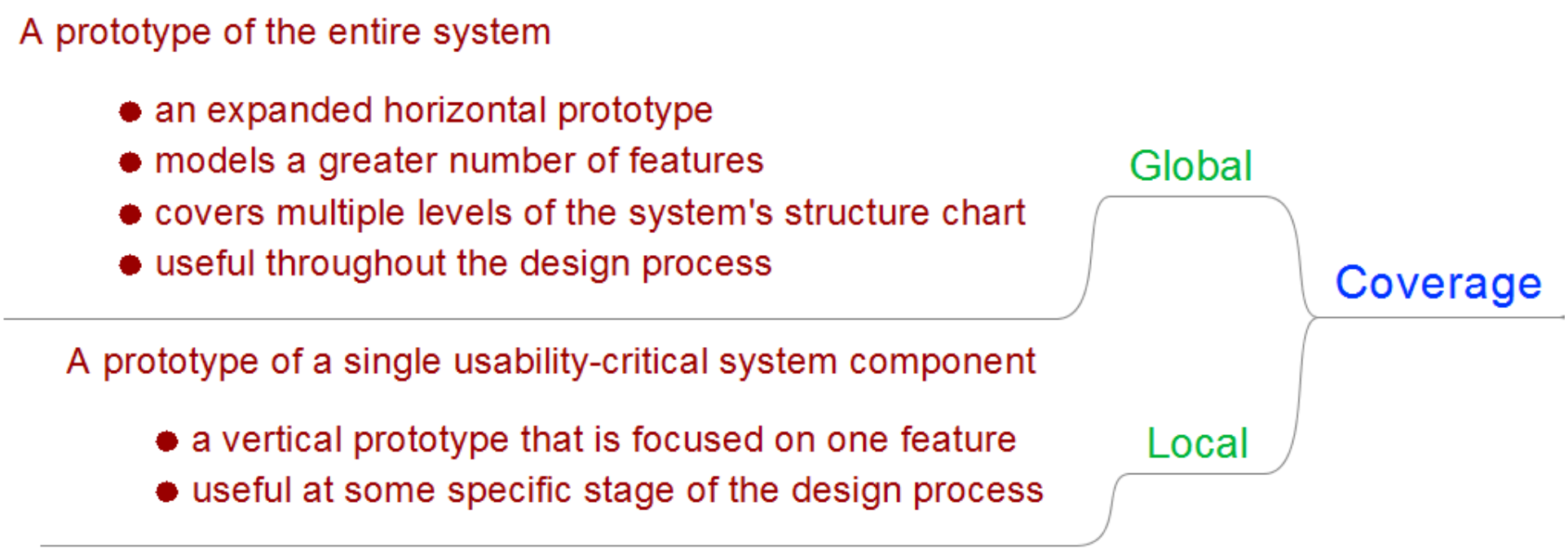
Prototype Features



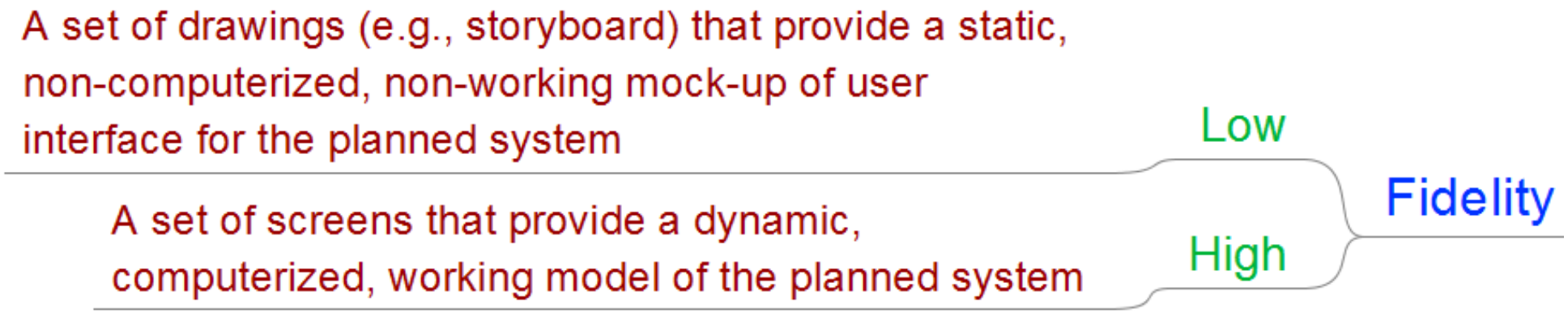
Prototypes Features



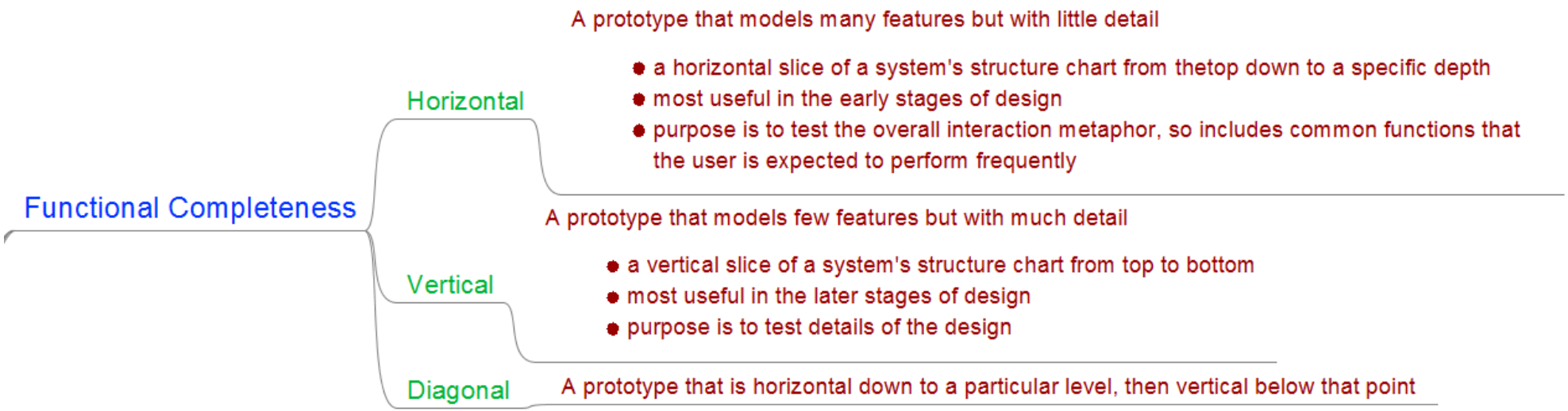
Prototypes Features



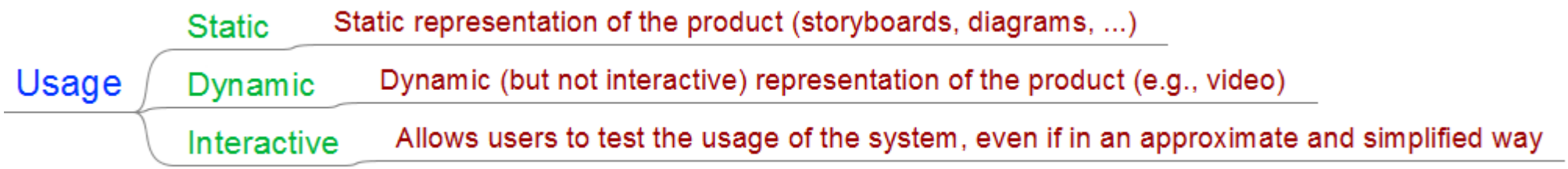
Prototypes Features



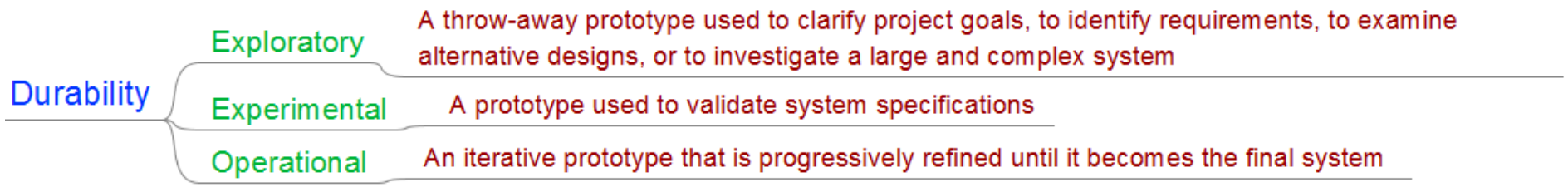
Prototypes Features



Prototype Features

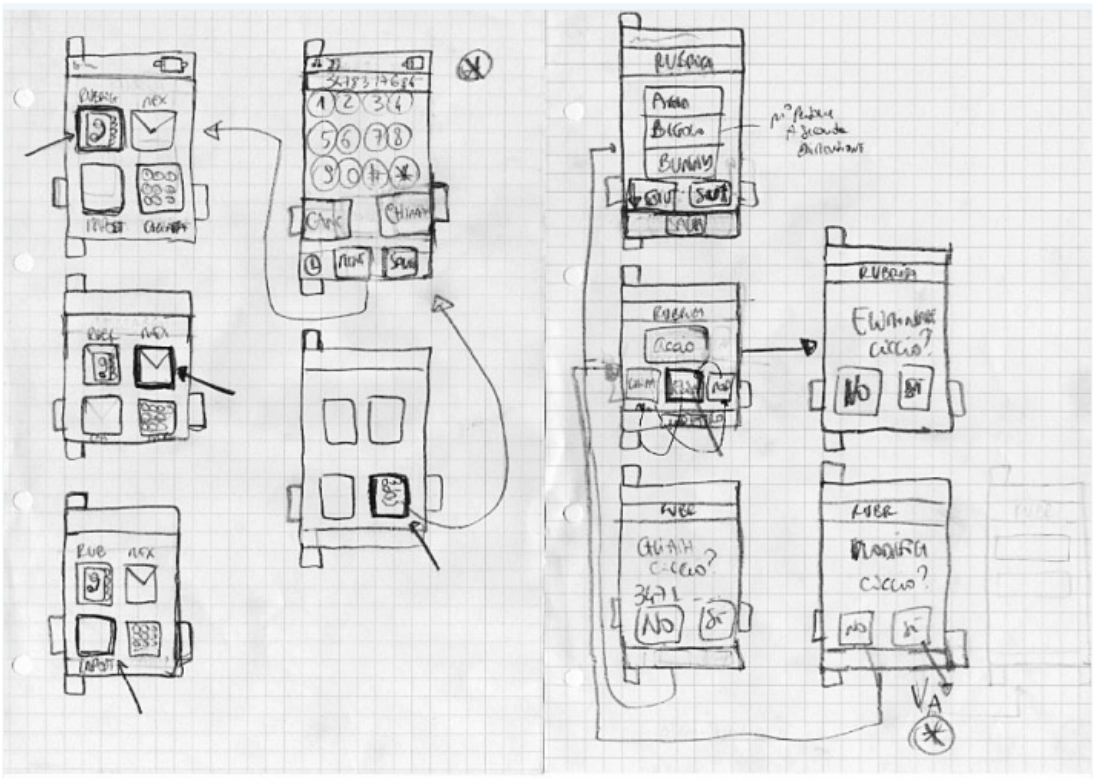


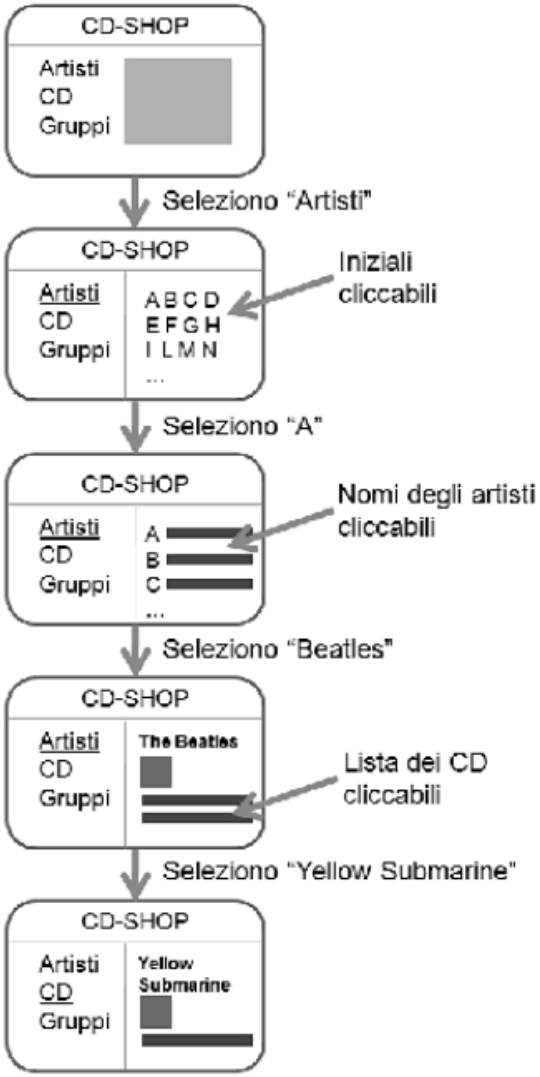
Prototypes Features



Sketch: Step 0

Sketch / Storyboard





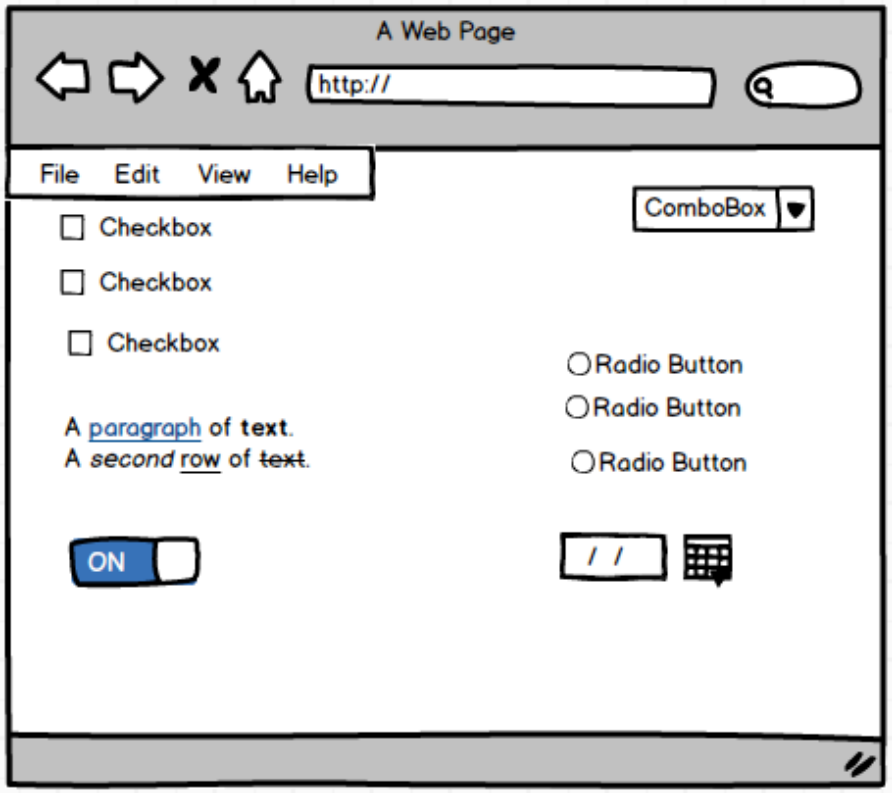
Usability Metrics

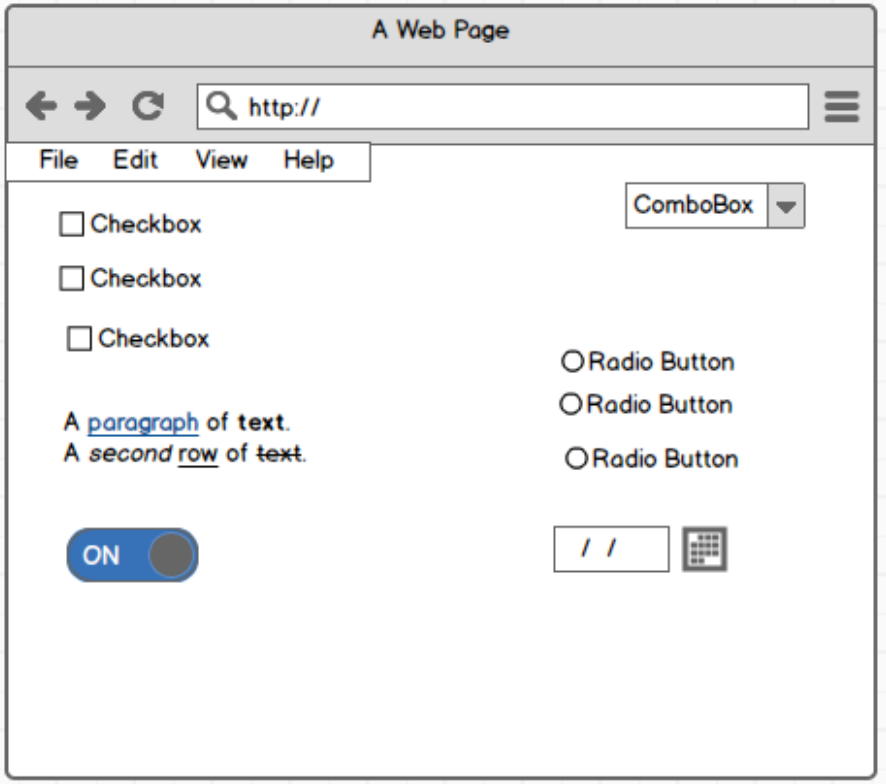
- Ease of learning
- Efficiency of use
- Storage
- Frequency and severity of errors
- Satisfaction

Project issues

- How to build navigation?
- Which reading order?
- Which elements to visualize?

Mockups VS Wireframes

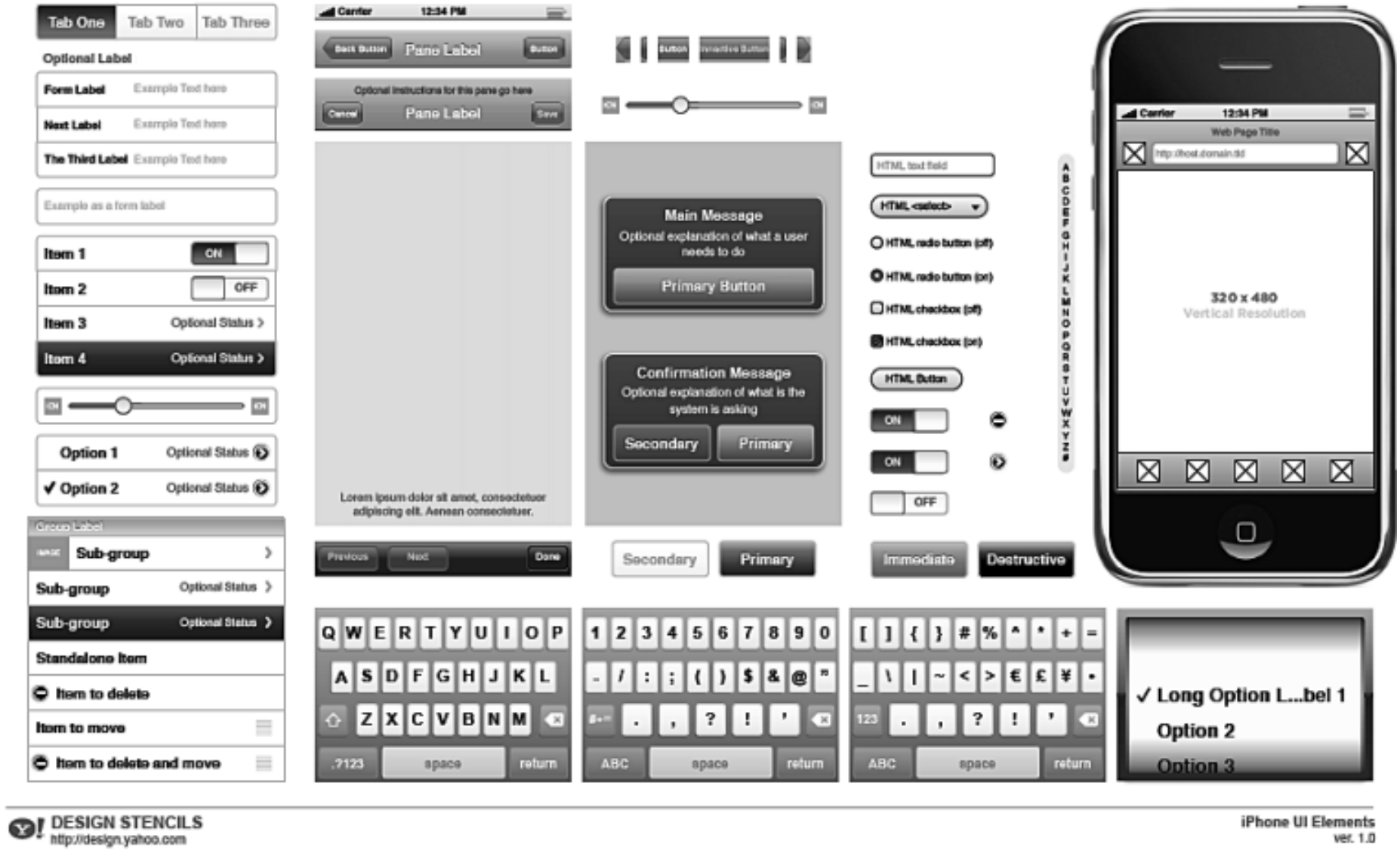




Paper Prototypes

Hypertext Prototypes (e.g. Powerpoint)

Stencil for Hypertext Prototypes



The UI Grammar

- Information architecture
  - Organization of information
- Layout
  - Organization of spaces
  - Each space has a specific informative value ("what" does it contain?)
  - Each space has a specific functional value ("what is it for"?)
- Interaction
  - What techniques to offer the user for interacting with the data?
  - Which widgets to use?

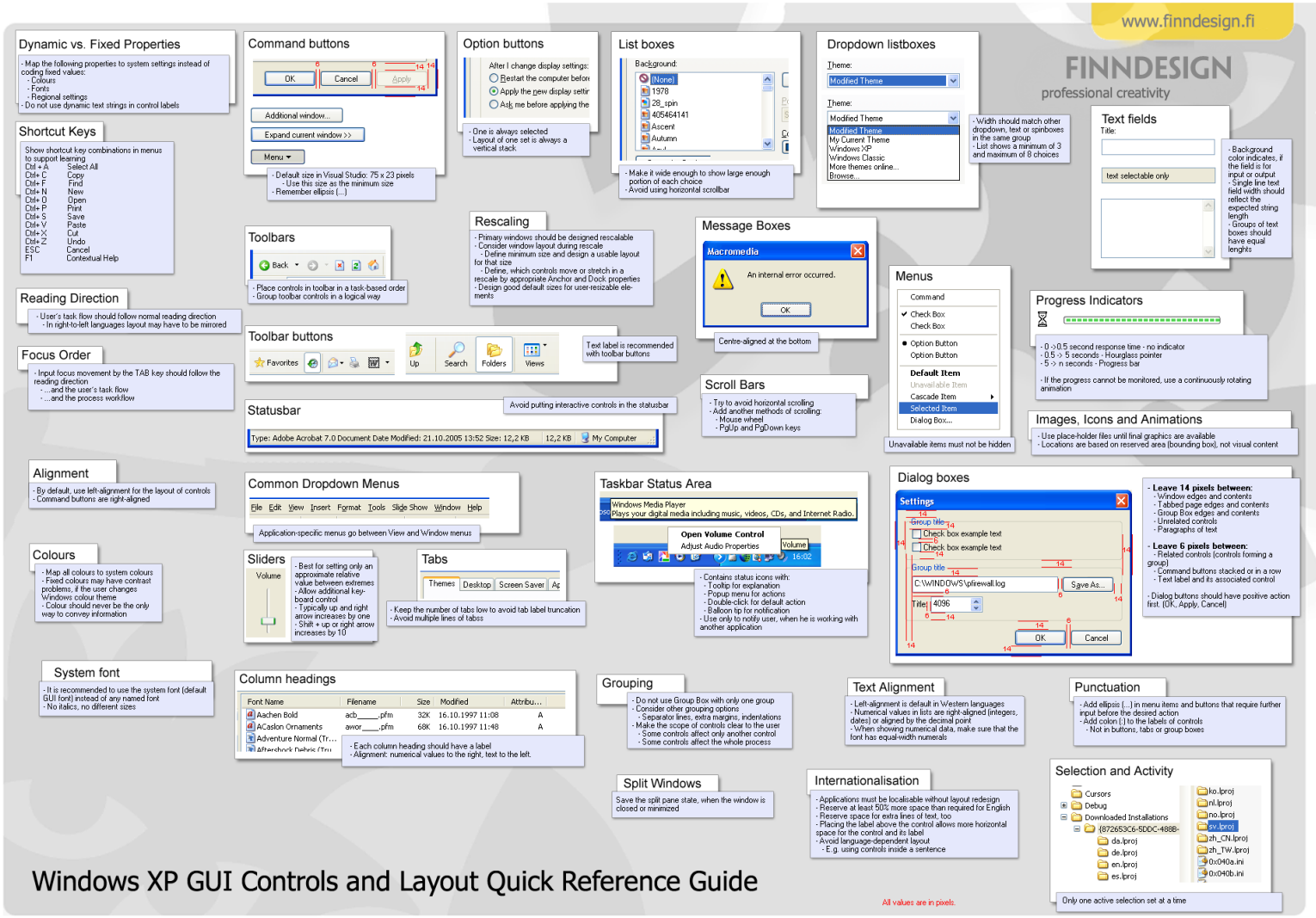
Interaction: What the User Can Do

- Read, display (text, images, ...)
- Analyze (lists, tables, graphs, ...)
- Insert (text, numbers, dates, ...)
- Choose (from lists, lists, ...)
- Search (starting from criteria)
- Filter (on existing lists)
- Confirm (ok, cancel, insert, delete, ...)
- Navigate (slideshow, paging, groups, tabs, ...)
- Select (one or more elements, parts of text, ...)
- Move (drag, swipe, ...)

Control / Widgets

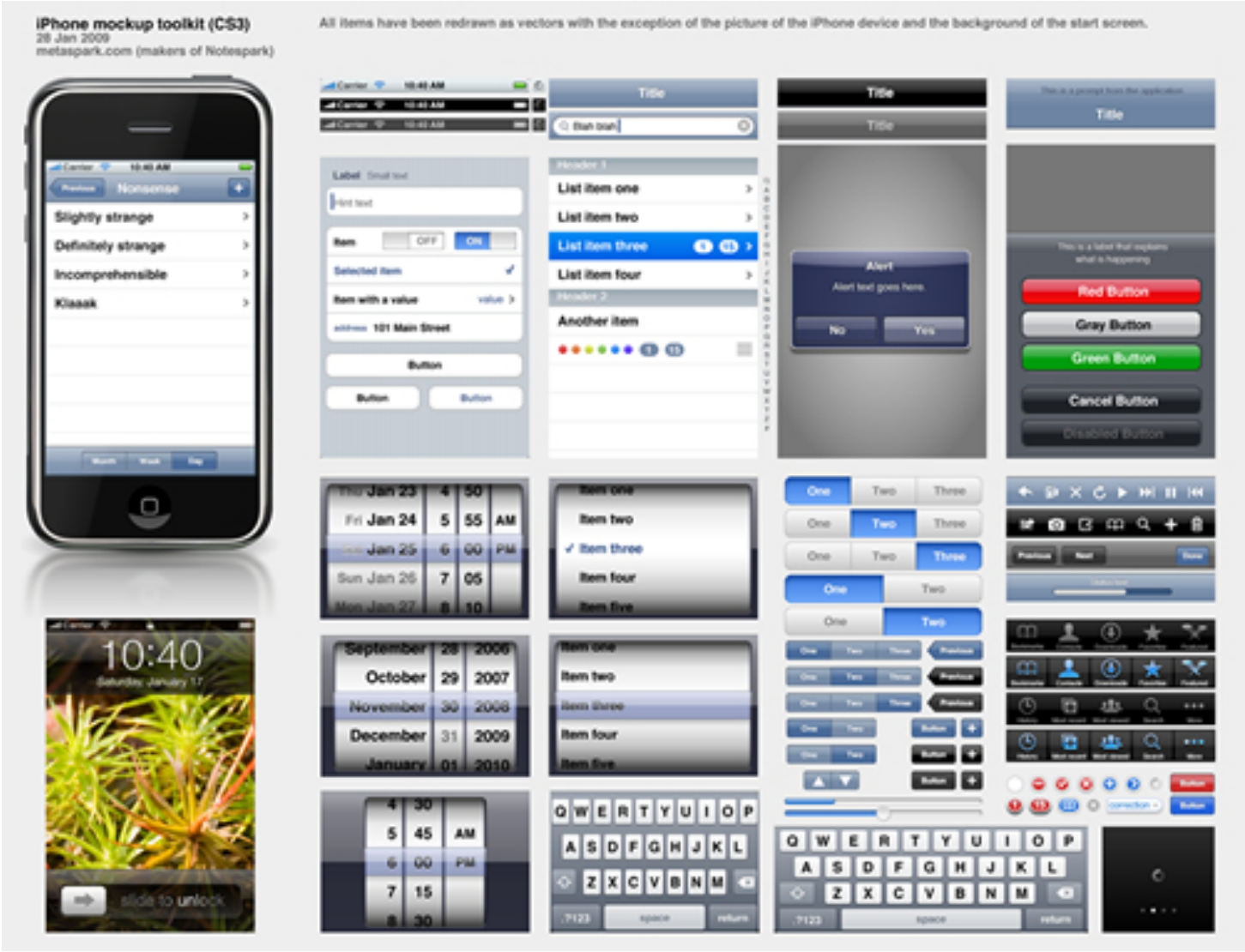
- Button
- Text (but also numbers, dates, …)
  - Single line / multiple lines
  - Display only / editable
- Radio buttons
- Check box
- List box
  - Visible
  - Drop down
- Combo box

Windows XP widgets

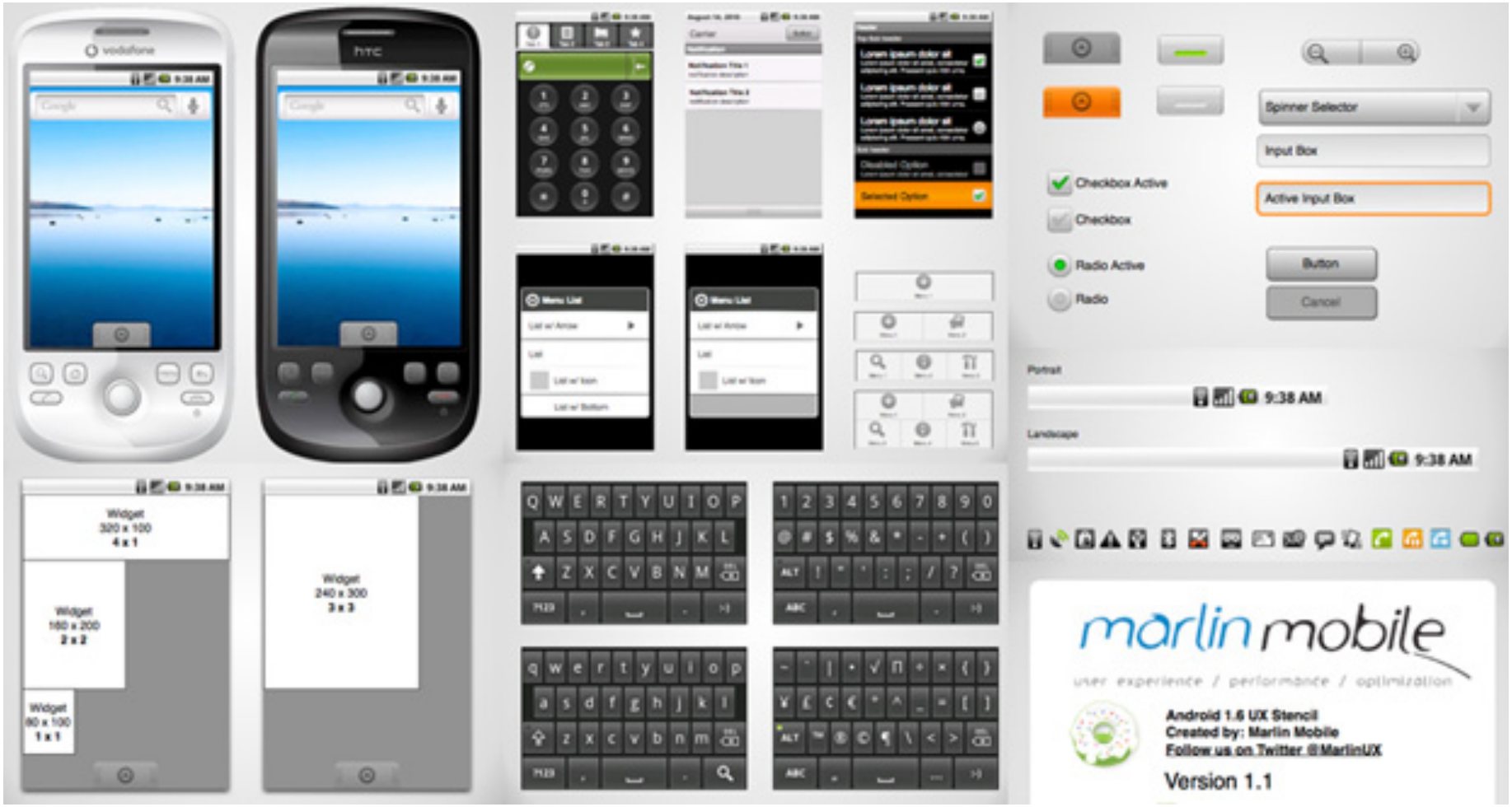


JavaFX Widgets

iPhone Widgets



Android Widgets



https://en.wikipedia.org/wiki/Programming_languages_used_in_most_popular_websites

Mockup Design Guidelines

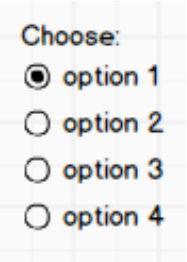
Choosing Controls

TASK	BEST CONTROL	IF SCREEN SPACE CONSTRAINTS EXIST
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).

https://uxdesign.cc/

1. *IF*:	*USE:*
• Mutually exclusive alternatives. • Discrete data. • Best represented verbally. • Very limited in number (2 to 8).	



AND:

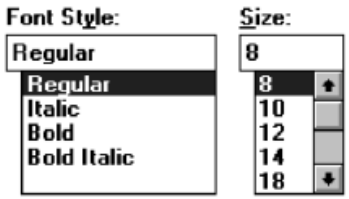
• Typed entry is never necessary. • Content can never change. • Adequate screen space is available.	RadioButtons

OR:

• Typed entry is never necessary. • Content can never change. • Adequate screen space is not available.	Drop-Down/Pop-Up List Box

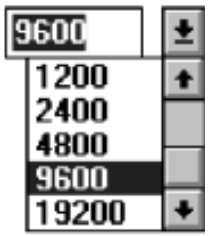
OR:

• Typed entry may be necessary. • Content can change. • Adequate screen space is available.	Combo box



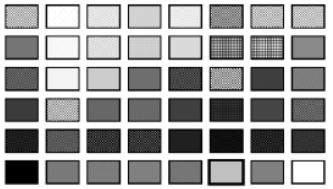
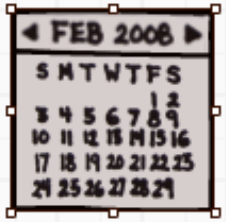
OR:

• Typed entry may be necessary. • Content can change. • Adequate screen space is not available.	Drop-Down/Pop-Up Combo Box



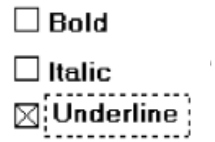
Choosing Controls

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:	*USE:*
• Mutually exclusive alternatives. • Discrete data. • Best represented graphically. • Content rarely changes. • Small or large number of items.	Palette  

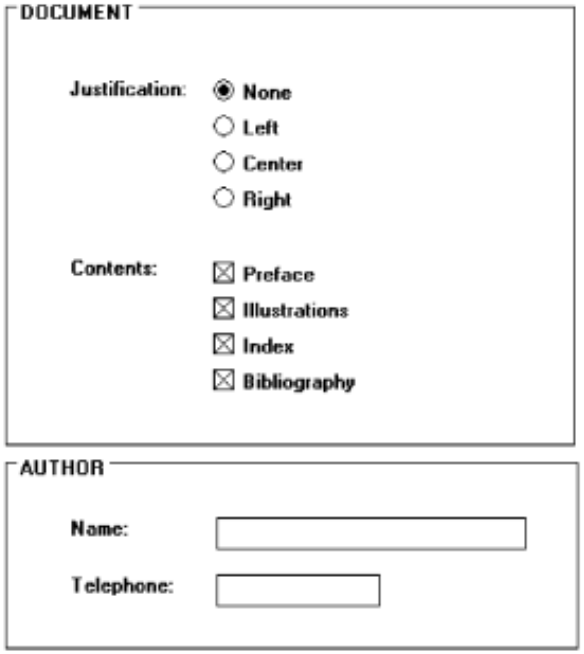
4. IF:	*USE:*
• Mutually exclusive alternatives. • Not frequently selected. • Content does not change. • Well-known, easily remembered data. • Predictable, consecutive data. • Typed entry sometimes desirable.	
AND:	
• Adequate screen space is not available.	Spin Box 
OR:	
• Adequate screen space is available.	Combo Box

Choosing Controls

5. IF:	*USE:*
• Mutually exclusive alternatives. • Continuous data with a limited range of settings. • Value increases/decreases in a well-known, predictable way. • Spatial representation enhances comprehension.	Slider 
6. IF:	*USE:*
• Nonexclusive alternatives. • Discrete data. • Best represented verbally. • Typed entry is never necessary. • Content can never change. • Adequate screen space is available.	
AND:	
• Very limited in number (2 to 8).	Check Boxes 
OR:	
• Potentially large in number (9 or more).	Multiple-Selection List Box

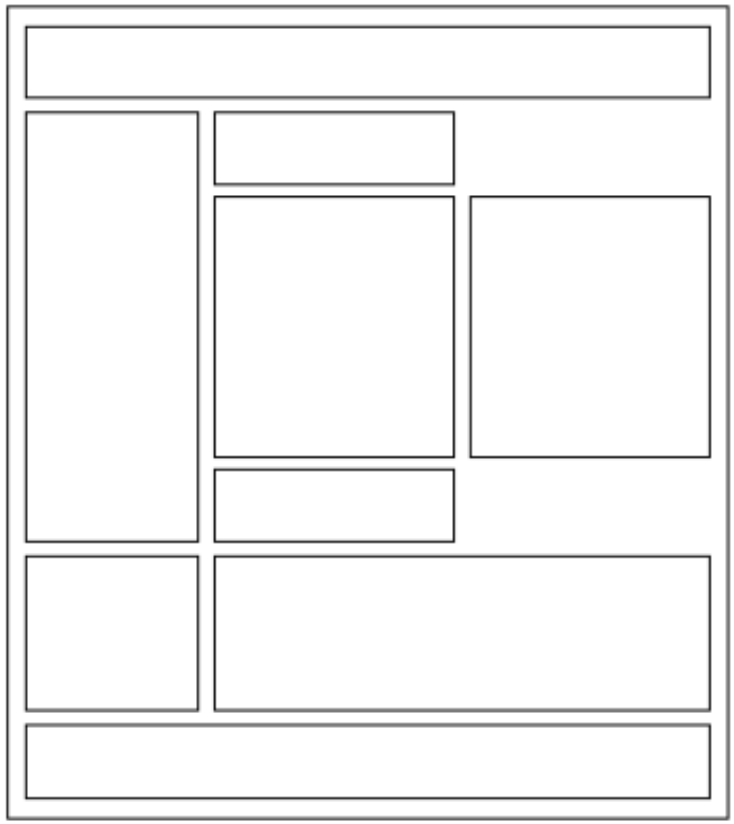
Grouping

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



Layout

- Spaces Hierarchy
- Function Recognition
- Spaces
- Includes navigation



- Adaptable to the screen of the device?

Use Cases VS 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

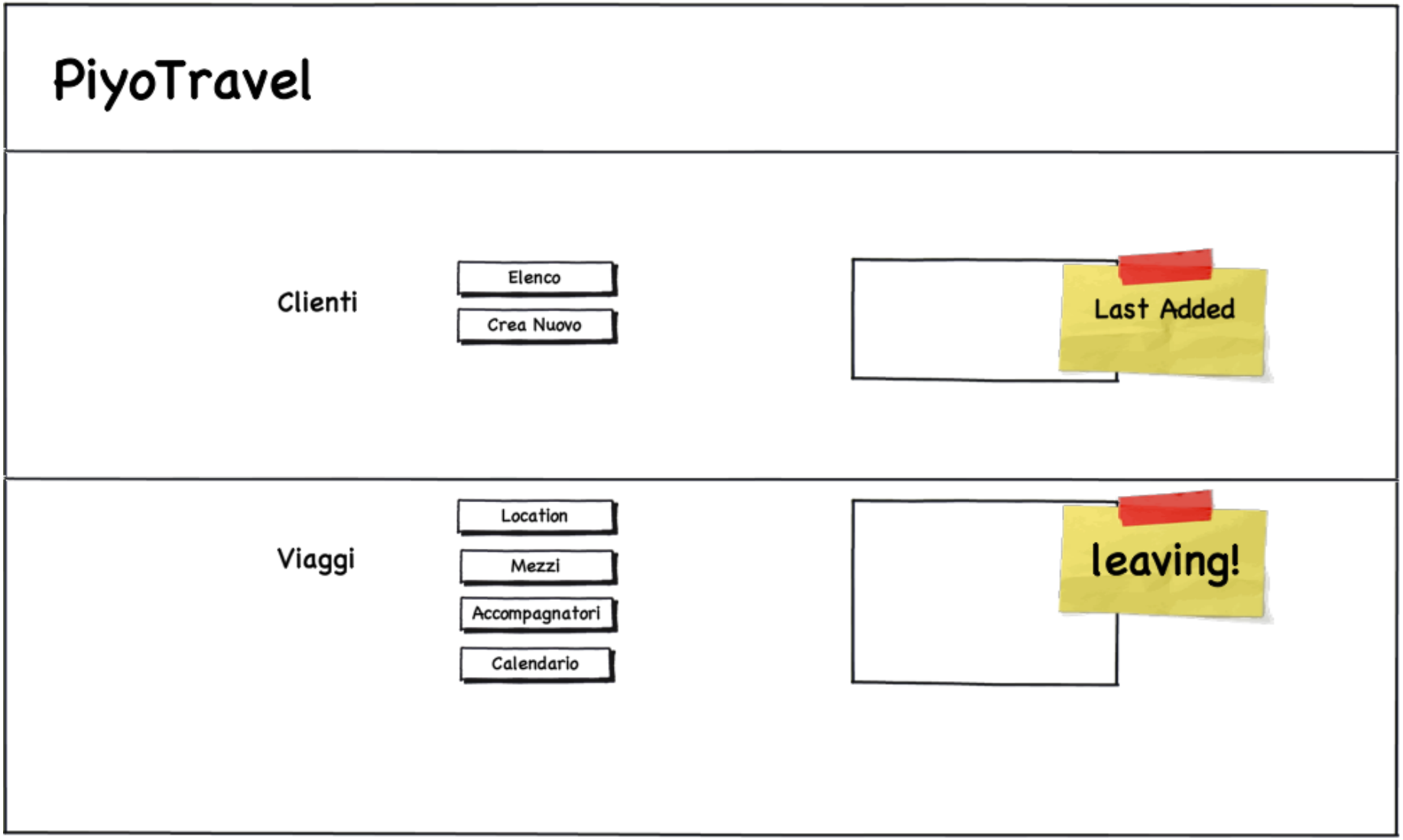
EXAMPLES

The real word is different...

- The users
- Functionality
- Flexibility
- Portability
- Reliability
- Security
- Integrity
- Maintenance
- Performance
- Scalability

- Costs
- Maintainance
- Development times
- Interactions with existing systems
- Interactions with the “physical” world

Example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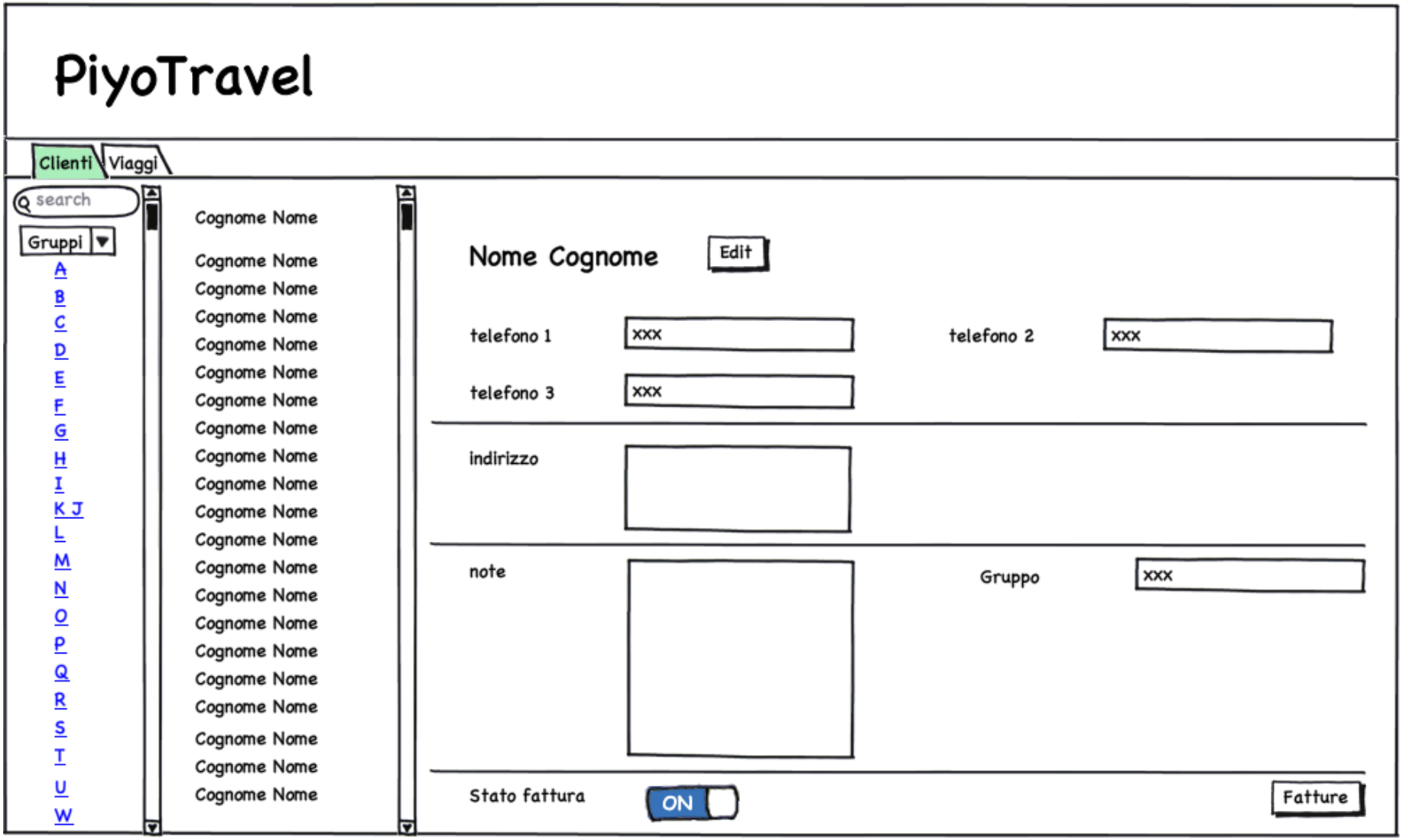
Example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Gruppo
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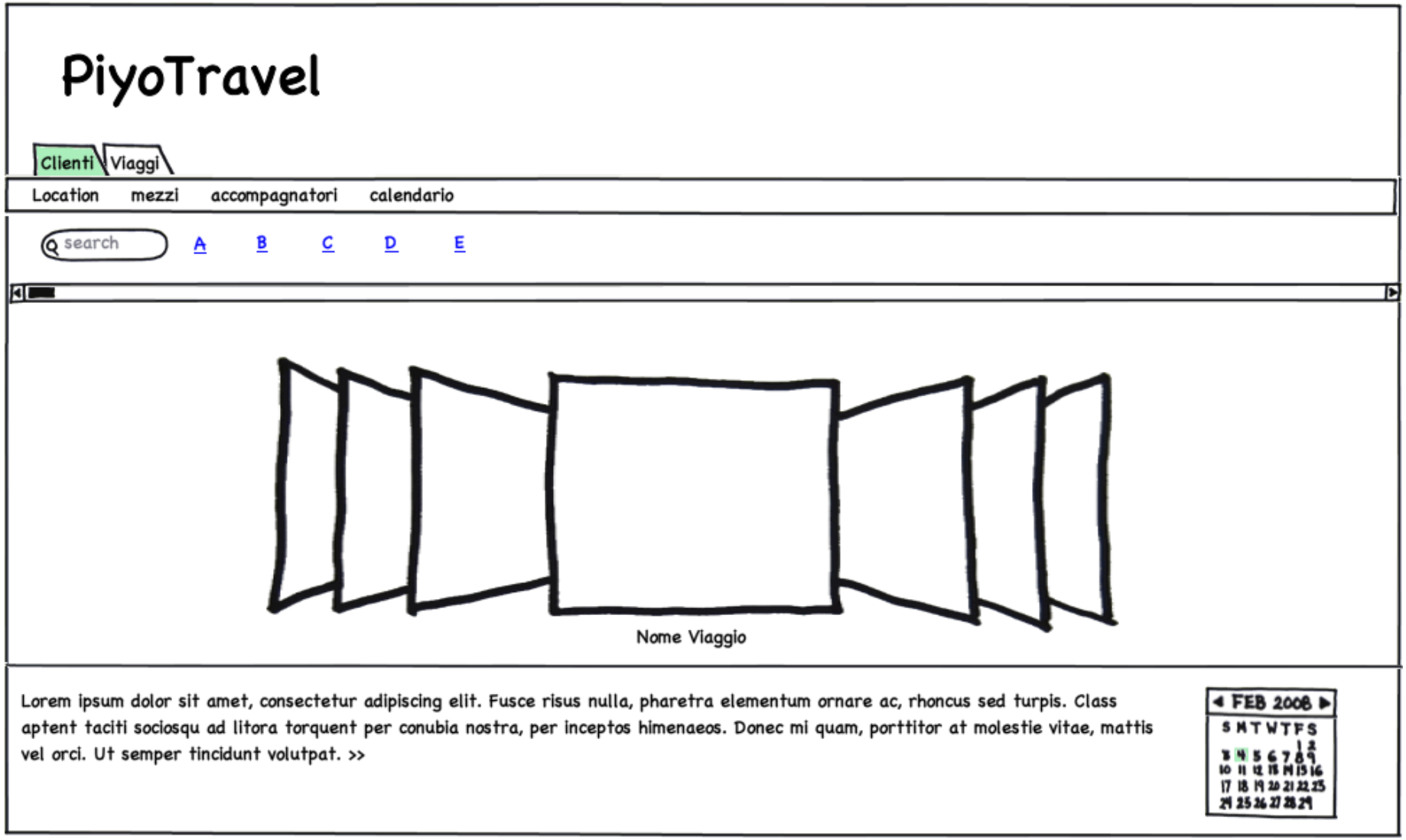
Example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FEB 2008

Look & Feel


PIYO TRAVEL
Clienti
Elenco + cerca
Crea nuovo
Last added
Viaggi
Location
Mezzi
Accompagnatori
Calendario
Leaving

Patterns: Some Examples

- Navigation Menu
- Login and Registration
- Search e Result pages
- Paging o scrolling
- Date Picker o Data Input
- Call for action

Patterns references

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

Best Practices: Some Examples

- Space Managements: all in one window, scrolling, resize
- Widget Selection: multiple list selection, Drag&Drop, command line
- Error Messages
- Panels: accordion, modal panel (LightBox)
- Wizard

Sources and References

- 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