

User Centered design



SoftEng
<http://softeng.polito.it>

UCD process – techniques

Activity#	Activity	Techniques
1	Identify the users	Personas
2	Define requirements	Stories, Focus group, Questionnaires, Interviews Ethnographics
3	Define system and interactions	Prototypes
4	In lab tests	Ethnographic, Interviews
5	In field tests	A/B testing Measurements

1 - Identify the users

Personas

- Identify and describe typical user representative of a class of users (aka clustering)
 - ◆ Ex persona1: female, middle age, professional, high income, married with children
 - ◆ Ex persona2: male, young, student, low income, not married

Personas

- For each persona describe life scenarios
 - ◆ Personal, work day: wake up, breakfast, drive children to school, drive to office ...
 - ◆ Personal, week end day: ...
- For each persona /scenario identify possible interaction with application/object

Example

User Persona Type



A quotation that captures this user's personality.

Age: 1-100
Work: Job title
Family: Married, kids, etc.
Location: City, state
Character: Type

Personality

Introvert	Extrovert
Thinking	Feeling
Sensing	Intuition
Judging	Perceiving

Goals

- A task that needs to be completed.
- A life goal to be reached.
- Or an experience to be felt.

Frustrations

- The challenges this user would like to avoid.
- An obstacle that prevents this user from achieving their goals.
- Problems with the available solutions.

Bio

The bio should be a short paragraph to describe the user journey. It should include some of their history leading up to a current use case. It may be helpful to incorporate information listed across the template and add pertinent details that may have been left out. Highlight factors of the user's personal and of professional life that make this user an ideal customer of your product.

Remember - you may modify this template, remove any of the modules or add new ones for your own purpose.

Trait 1 Trait 2 Trait 3 Trait 4

Motivation

Incentive	<div style="width: 80%;"></div>
Fear	<div style="width: 20%;"></div>
Growth	<div style="width: 70%;"></div>
Power	<div style="width: 60%;"></div>
Social	<div style="width: 90%;"></div>

+ ≡ ⋮

Brands & Influencers



Preferred Channels

Traditional Ads	<div style="width: 10%;"></div>
Online & Social Media	<div style="width: 80%;"></div>
Referral	<div style="width: 20%;"></div>
Guerrilla Efforts & PR	<div style="width: 40%;"></div>

2 - Define Requirements

Stories

- Help to understand interactions
- Are a cheap way to illustrate design solution from user's (persona's) point of view
- Tell user's goals, motivations and actions

Stories

- “What should this product do?”
- “How would user behave in this context?”
- “What if...?”

Stories

- Without your solution present-based
 - ◆ Focus is set on current practices that illustrate ‘state of the art’ and the problem context
- With your solution future-based
 - ◆ Focus on how problems could be addressed (without diving into details and jargon)

Stories

- In what settings will the product be used?
- Is the persona frequently interrupted?
- With what other products will it be used?
- What primary activities does the persona need to perform to meet her goals?
- What is the expected end result of using the product?

Example

Tim Marcus

50, botanic garden worker, father of two children



As a lead gardener, Tim is responsible in ordering nutritions and specific soil for the plants for the city's botanic garden. Currently he has to do bi-weekly orders over the phone from his office, calling manufacturers one by one.

Goals

- Wants to manage bulk orderings more efficiently
- Is looking for quality reviews about new products

Example

It's Friday afternoon.

Tim opens his desktop computer at the botanic center's office. He wants to be quickly done with the extra flower soil orders.

Tim decides to order the same combination of products as four weeks ago, but in smaller quantity. He does not order nutritions this time.

Tim is not interested in staying at the office long. As soon as the order is done, he leaves work to pick his daughter from school.



Example – Story

It's Friday afternoon.

Tim opens his desktop computer at the botanic center's office. He wants to be quickly done with the extra flower soil orders.

Tim decides to order the **same combination of products** as four weeks ago, but in smaller quantity. He **does not order nutritions** this time.

Tim is not interested in staying at the office long. As soon as the order is done, he leaves work to pick his daughter from school.



Example – Story



It's Friday afternoon.

Story Background

Tim opens his desktop computer at the botanic center's office. He wants to be quickly done with the extra flower soil orders.

Tim decides to order the **same combination of products** as four weeks ago, but in smaller quantity. He **does not order nutritions** this time.

Tim is not interested in staying at the office long. As soon as the order is done, he leaves work to pick his daughter from school.

Example – Story



It's Friday afternoon.

Story Background

Tim opens his desktop computer at the botanic center's office. He wants to be quickly done with the extra flower soil orders.

Goal: quick

Tim decides to order the same combination of products as four weeks ago, but in smaller quantity. He does not order nutritions this time.

Tim is not interested in staying at the office long. As soon as the order is done, he leaves work to pick his daughter from school.

Example – Story



It's Friday afternoon.

Story Background

Tim opens his desktop computer at the botanic center's office. He wants to be quickly done with the extra flower soil orders.

Goal: quick

Tim decides to order the same combination of products as four weeks ago, but in smaller quantity. He does not order nutritions this time.

High level actions (e.g. re-ordering x with changes, not ordering y.)

Tim is not interested in staying at the office long. As soon as the order is done, he leaves work to pick his daughter from school.

Example – Story



It's Friday afternoon.

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What next?

- Use case / scenario (see requirements engineering slides)

Focus group

- Moderator + group of homogeneous people
 - Moderator starts and monitors discussion on a defined topics
 - Open or script guided
-
- Long
 - Group interaction

Questionnaire

- Written questions with open /close answers
- Statistical analysis, more data points possible

Interview

- Deep discussion, one to one
- Open or guided by script / questions

- Interviewer reports log

- Long, detailed

Ethnographics

- Researcher is ‘hidden’ in an environment and observes facts and behaviour of user / population
- Expensive, long
- Risk of being invasive

3 - Define System and Interactions

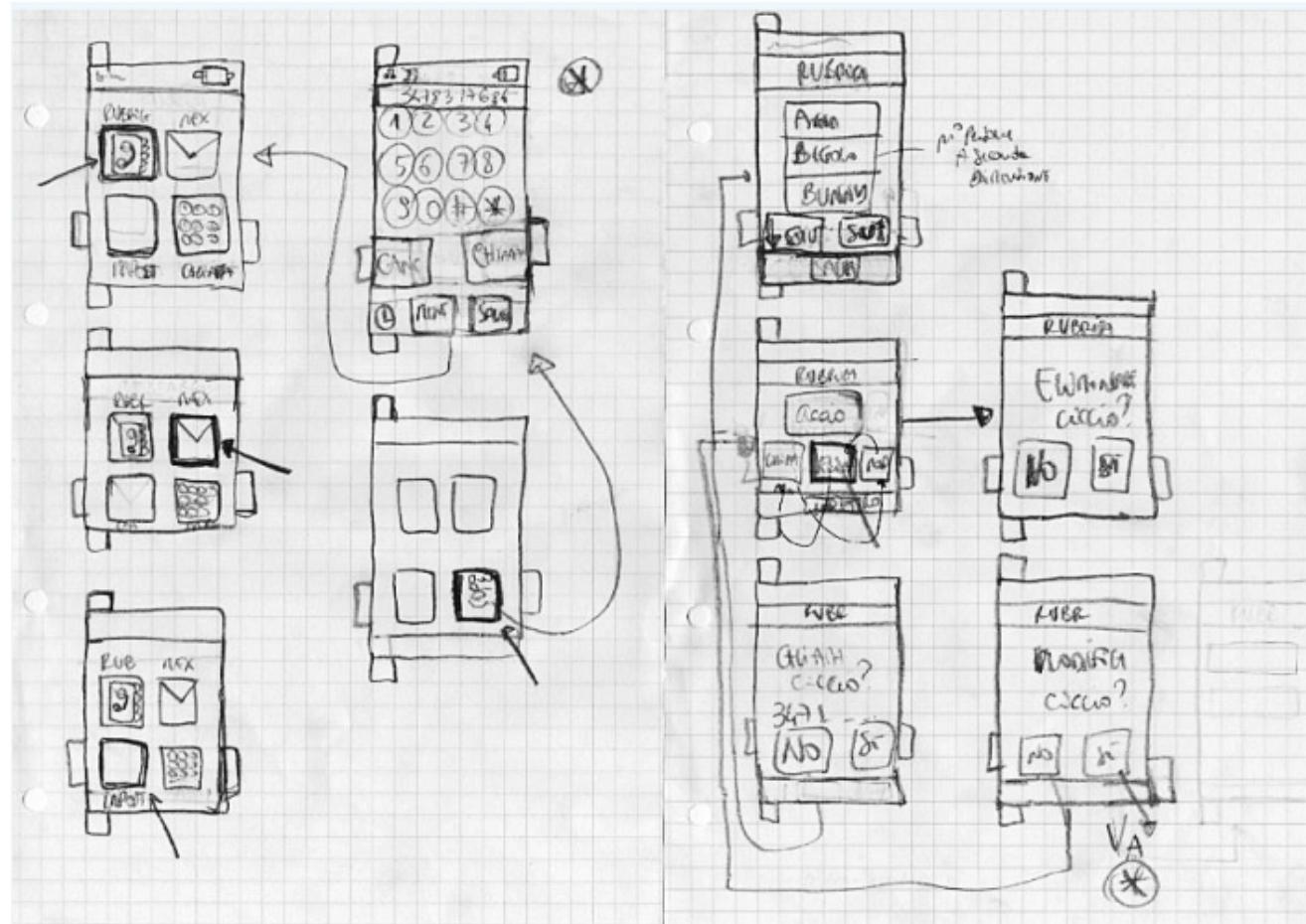
Prototypes

- Low fidelity
 - ◆ Paper / pencil, sketches, post its
- High fidelity
 - ◆ Computer executable mock ups
 - Aka Powerpoint
 - Aka Balsamiq
 - ◆ Actual GUIs
 - GUI Builders:
 - WindowBuilder (Eclipse, Java)
 - NetBeans Gui Builder (Net Beans)

Sketch



Sketch / storyboard



Sketch



4 - In lab tests

Feedback - low fi prototype

- Cognitive / ergonomics experts apply checklists / experience to identify possible issues

Feedback - hi fi prototype

- Selected users use the prototype in a lab
- Feedback via
 - ◆ Ethnographics
 - ◆ Interviews
 - ◆ Focus group

5 - In fields tests

Feedback, final system

- Define and collect measures about
 - ◆ Usage of system (time spent on different pages / part of pages, errors)
 - ◆ Effect of system, conversion rate (ex rate from browse to purchase)

Feedback

- A/B test



GUI Design

Designing the GUI

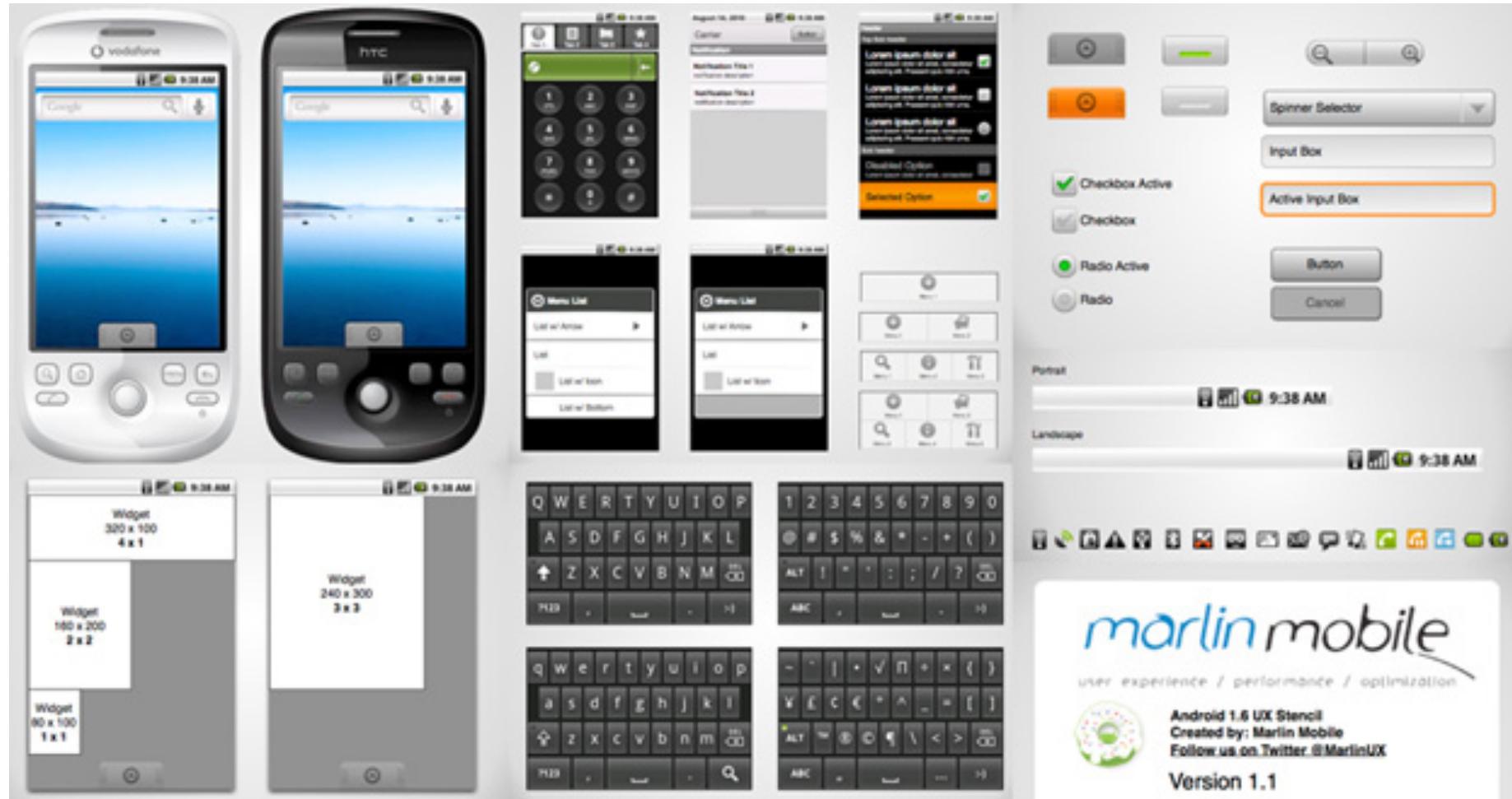
- Technical elements
- Usability guidelines

Technical elements

Java



Android



IOS

iPhone mockup toolkit (CS3)
26 Jan 2009
metaspark.com (makers of Notespark)

All items have been redrawn as vectors with the exception of the picture of the iPhone device and the background of the start screen.

The image displays a grid of iPhone user interface mockups. At the top left is a physical iPhone device showing a list of items like 'Slightly strange' and 'Definitely strange'. Below it is a lock screen with the time '10:40' and a green plant wallpaper. The main area contains several types of UI components:

- A search bar with placeholder text 'Search'.
- A list view with sections 'Header 1' and 'Header 2', containing items such as 'List item one', 'List item two', 'List item three' (which is selected), 'List item four', and 'Another item'.
- A modal alert with the title 'Alert' and message 'Alert text goes here.' with 'No' and 'Yes' buttons.
- A button bar with 'Red Button', 'Gray Button', 'Green Button', 'Cancel Button', and 'Disabled Button'.
- A date picker showing dates from Jan 23 to Jan 27.
- A list view with items 'Item one', 'Item two', '✓ Item three' (selected), 'Item four', and 'Item five'.
- A tab bar with tabs 'One', 'Two', and 'Three'.
- A navigation bar with icons for back, forward, and search.
- A settings screen with various icons and labels.
- Two different QWERTY keyboards at the bottom.

Windows

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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+Shift+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+Y: 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 them
- Use icons where possible
- 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

Dynamic vs. Fixed Properties

Command buttons

Option buttons

List boxes

Rescaling

Toolbar buttons

Statusbar

Scrollbar

Message Boxes

Text fields

Menus

Progress Indicators

Images, Icons and Animations

Common Dropdown Menus

Taskbar Status Area

Dialog boxes

Column headings

Grouping

Text Alignment

Punctuation

Selection and Activity

Split Windows

Internationalisation

Only one active selection set at a time

Windows XP GUI Controls and Layout Quick Reference Guide

All values are in pixels.

Issue

- Portability of the GUI
 - ◆ Redevelop GUI for each environment
 - ◆ Cross platform compilers
 - Ex Xamarin, Cordova, Flutter, ..
 - ◆ Cross platform GUI
 - Browser

Usability guidelines

- Have same style and format in all pages
- Do not ask same info twice
- Give feedback
 - ◆ When button clicked, when text inserted, when processing
- Make interactive objects obvious
 - ◆ Large buttons, blinking, ..

Usability guidelines

- Consider default values in input fields
- Clear success / error messages
- Show clearly navigation hierarchy
 - ◆ Use breadcrumb trails

Usability guidelines

- Simplicity /readability
 - ◆ Min number of pages
 - ◆ Min number of colors / fonts
 - ◆ Font min size
 - ◆ N elements in page
 - ◆ N pages
- Use conventions
 - ◆ Logo at top left
 - ◆ Click on logo brings to home
 - ◆ Links change color when mouse hovers

Summary

- In mass market products User interaction is key
- User centered design
 - ◆ Focuses on user feedback
 - ◆ Using several techniques in a defined process