Chapter 3 - User Centered Design & Prototypes

- User Centered Design (UCD)
  - Understanding
  - Design
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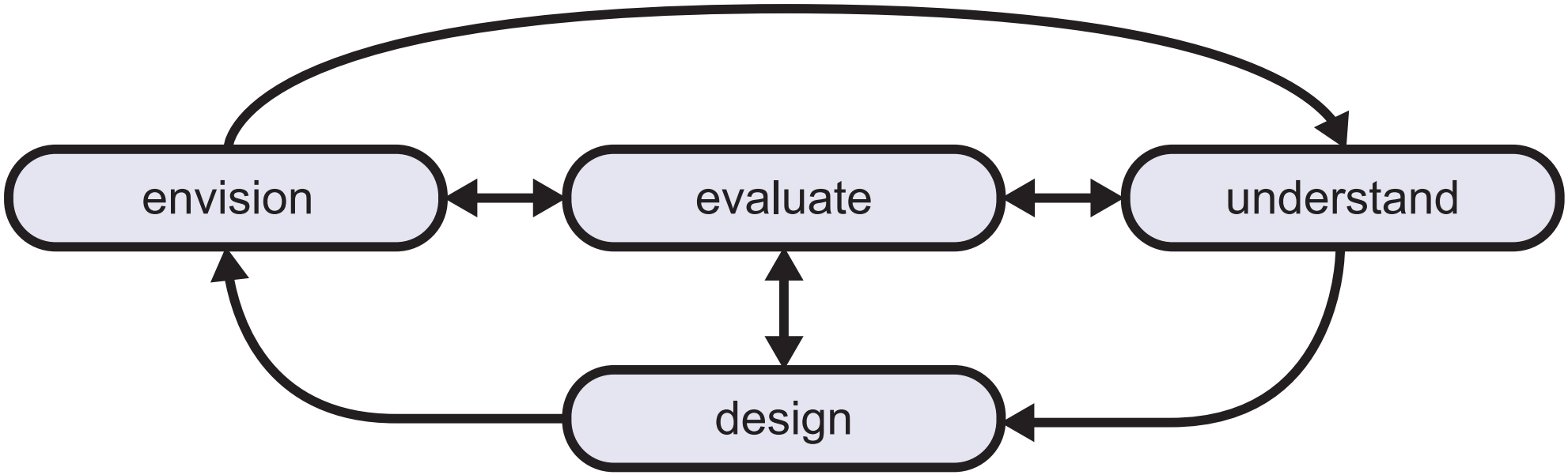
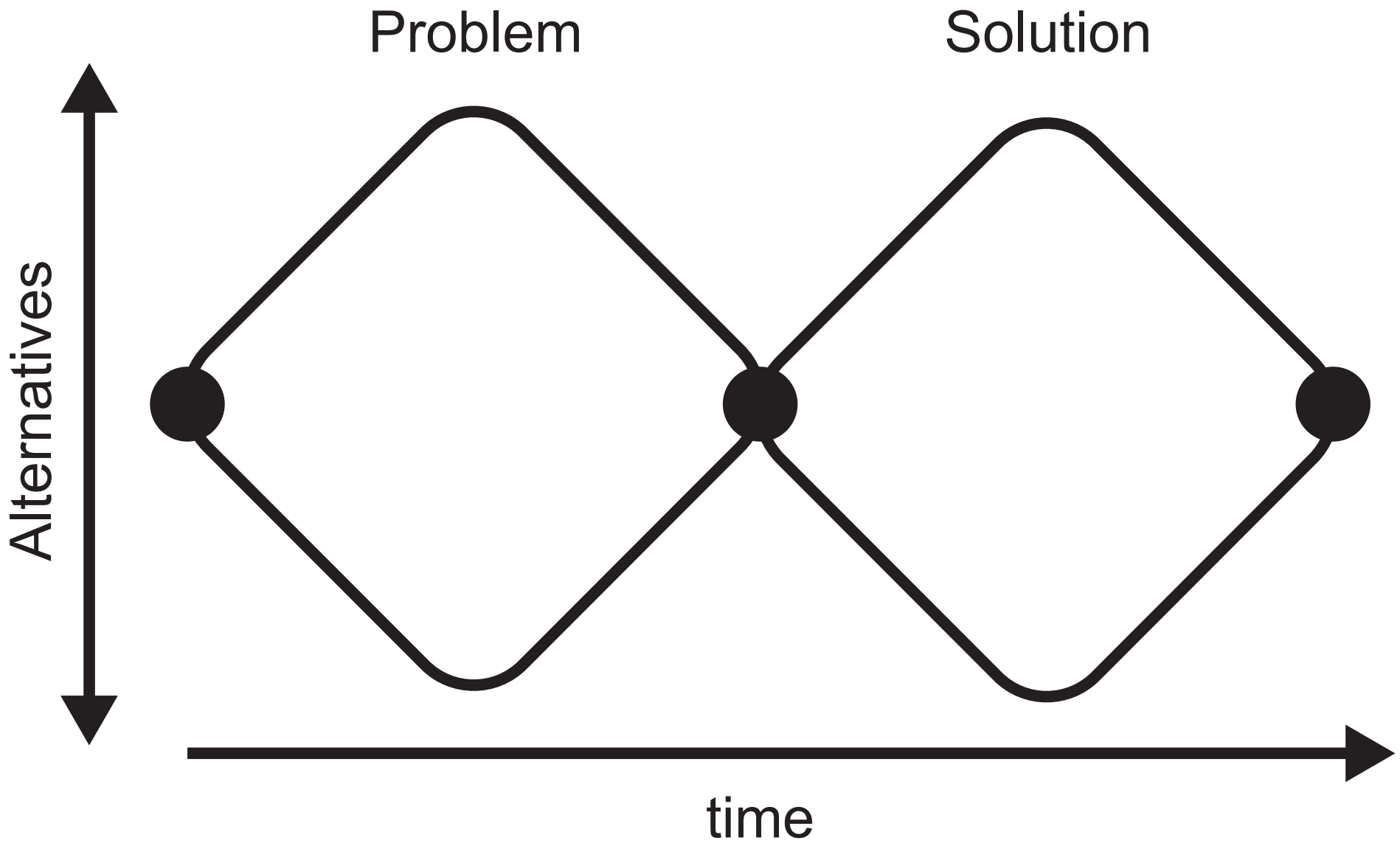
User-Centered Design
according to Dix et al. and Benyon (2010)



Design (according to Dix et al., 2004) =
Achieve goals under consideration of constraints

User-Centered Design according to Don Norman



Group Exercise!

- Form groups of 3-5 persons!
  - Within each group, try to fulfill the following two tasks:
- Task 1:
  - Name as many concrete experiences in private or professional life, where you have already used an approach similar to the double-diamond idea – or where you think in afterthought it would have been applicable
  - Result: List of situations in keywords, as many as possible
- Task 2:
  - Which tools and techniques do you know to support the steps of
    - envisioning
    - understanding
    - designing
    - evaluating?
  - Result: List of keywords

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Understanding

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Conceptual Design

Questions

- What do you think was the meaning of the ***colors*** of the sticky notes?
- How much time should be spent on such conceptual design activities?
- How can we assess the quality of the result of conceptual design?

Concrete or Physical Design

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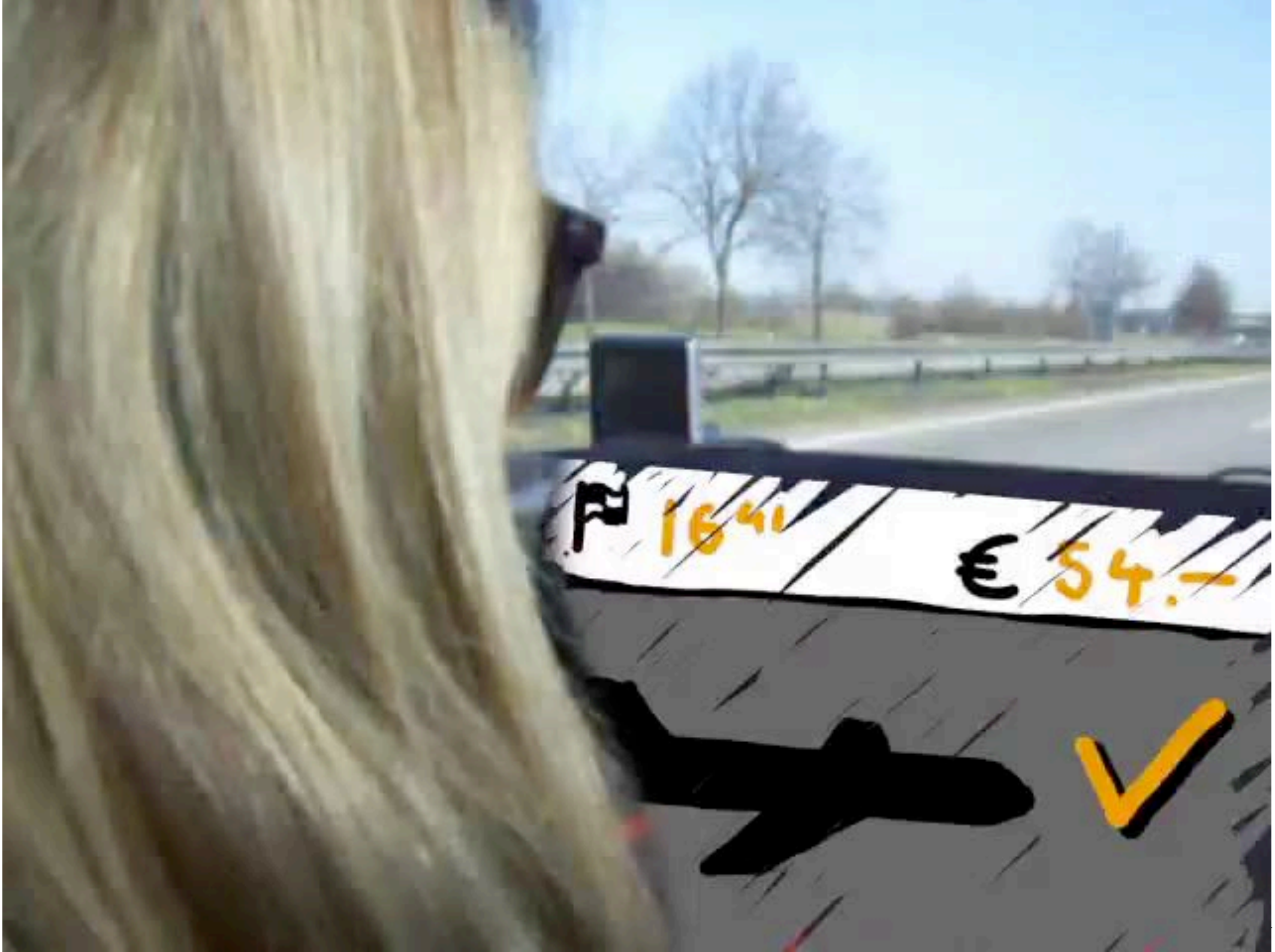
1641
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Evaluation

www.xperienceconsulting.com

http://01.edu-cdn.com/files/static/wiley/9780471419204/CONTROLLED_EXPERIMENTS_01.GIF

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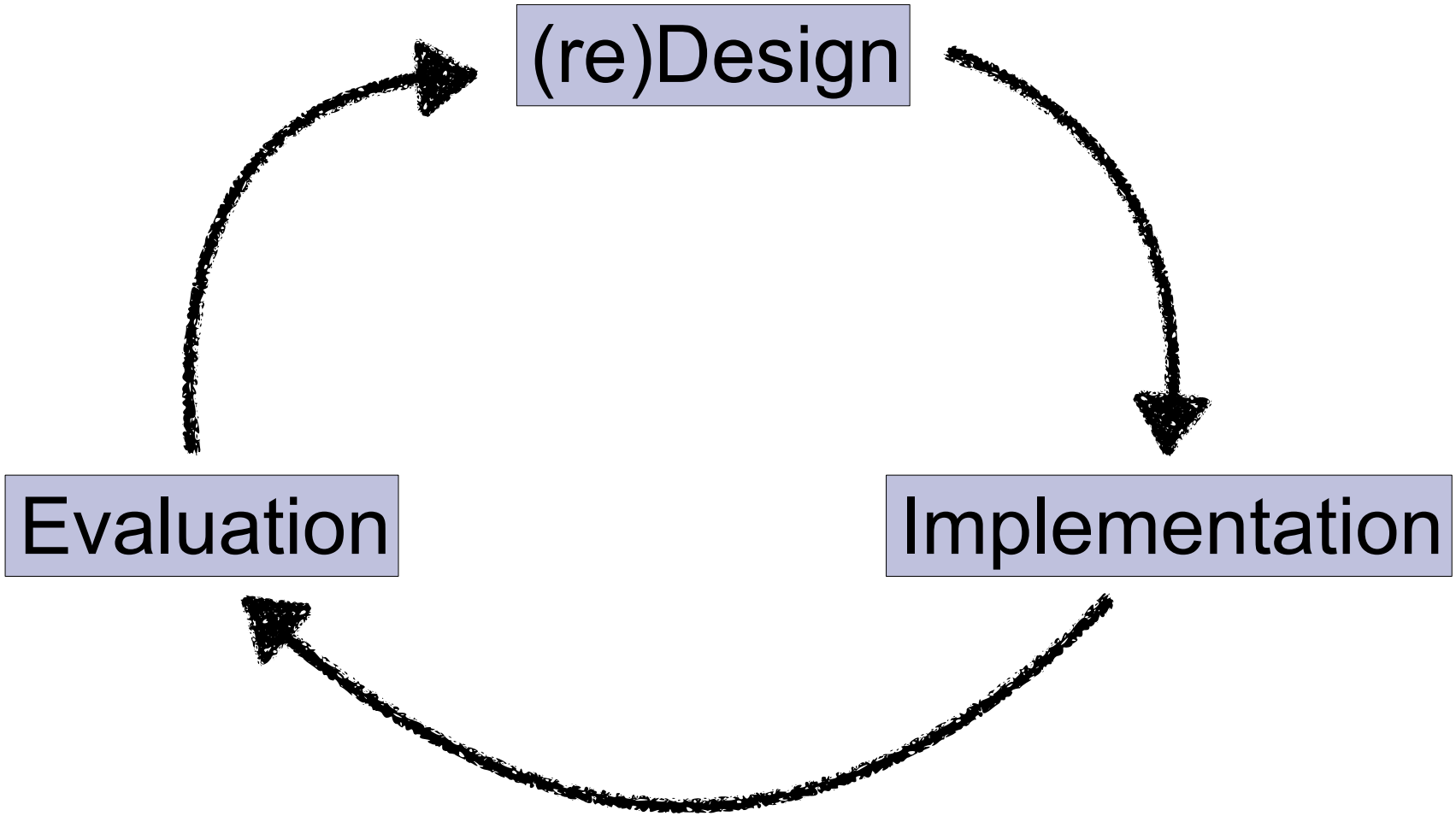
Iterative Design



Question: Can anybody explain what the buzzword "agile" actually means?

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Implementation

- During the process only prototypes have been developed
- Source code of prototypes usually is not re-usable
  - this is intentional! See chapter on prototyping…
- Final implementation brings on new challenges
  - Scalability
  - Platform diversity
  - Error tolerance
  - Commercialization
  - …others? discussion…

http://fergusonvalues.com/wp-content/uploads/2012/03/From-Idea-to-Implementation2-300x262.jpg

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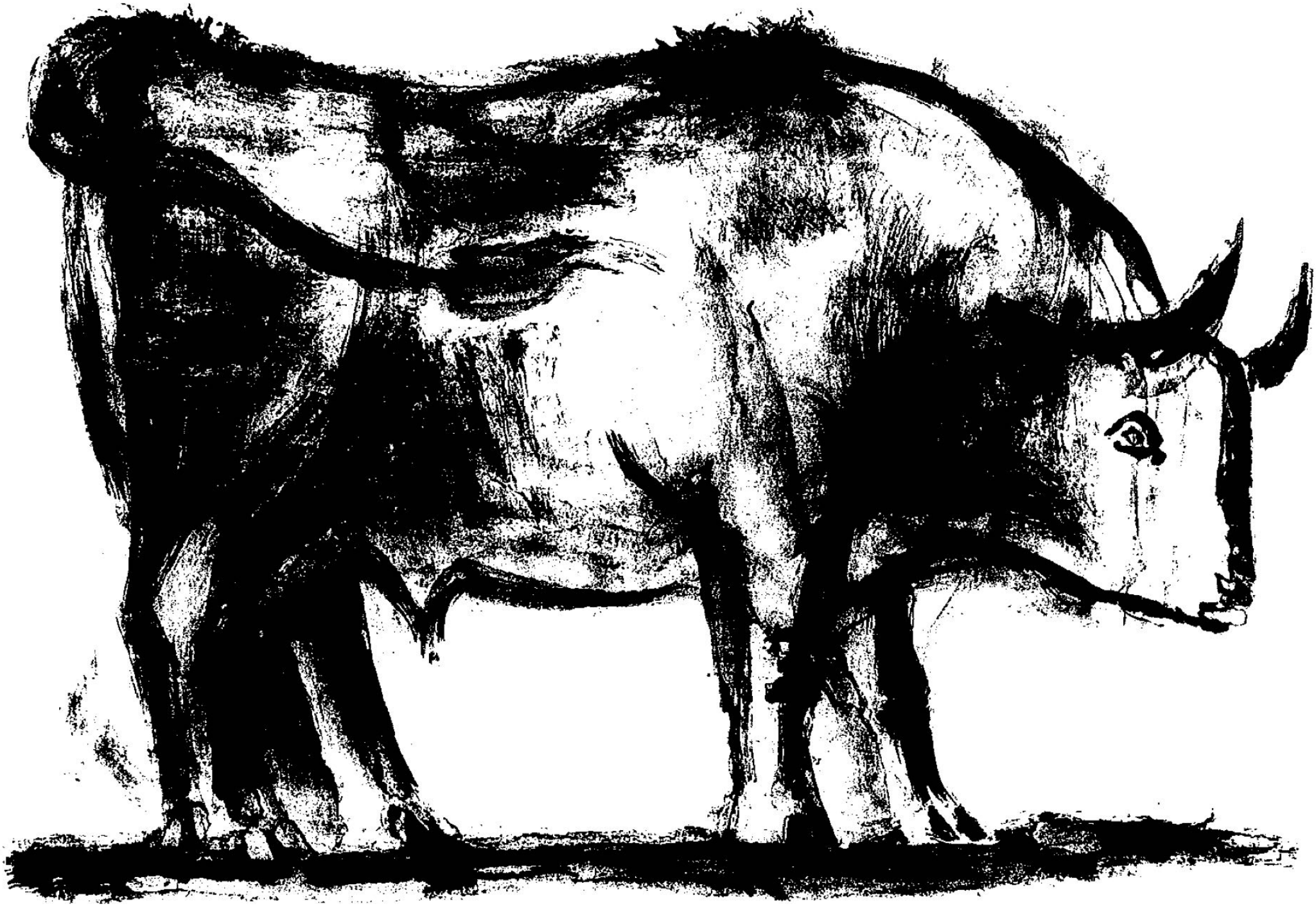


Proof Sketch in Mathematics

Theorem There does not exist r in $\mathbf{Q}$ such that $r^2 = 2$.

PROOF SKETCH: We assume $r^2 = 2$ for $r \in \mathbf{Q}$ and obtain a contradiction. Writing $r = m/n$, where m and n have no common divisors (step 1), we deduce from $(m/n)^2 = 2$ and the lemma that both m and n must be divisible by 2 (steps 2 and 3).

ASSUME: 1. $r \in \mathbf{Q}$
2. $r^2 = 2$

PROVE: False

1. Choose m, n in $\mathbf{Z}$ such that
   1. $\gcd(m, n) = 1$
   2. $r = (m/n)$
2. 2 divides m.
3. 2 divides n.
4. Q.E.D.

Leslie Lamport:
How to Write a Proof,
Digital Equipment Corporation 1993

http://research.microsoft.com/en-us/um/people/lamport/pubs/lamport-how-to-write.pdf

Sketch in Patent Application

United States Patent Application 20100081477

Motorola, Inc.

PORTABLE DEVICE DISPLAY PRESENTING TWO AND THREE DIMENSIONAL IMAGES

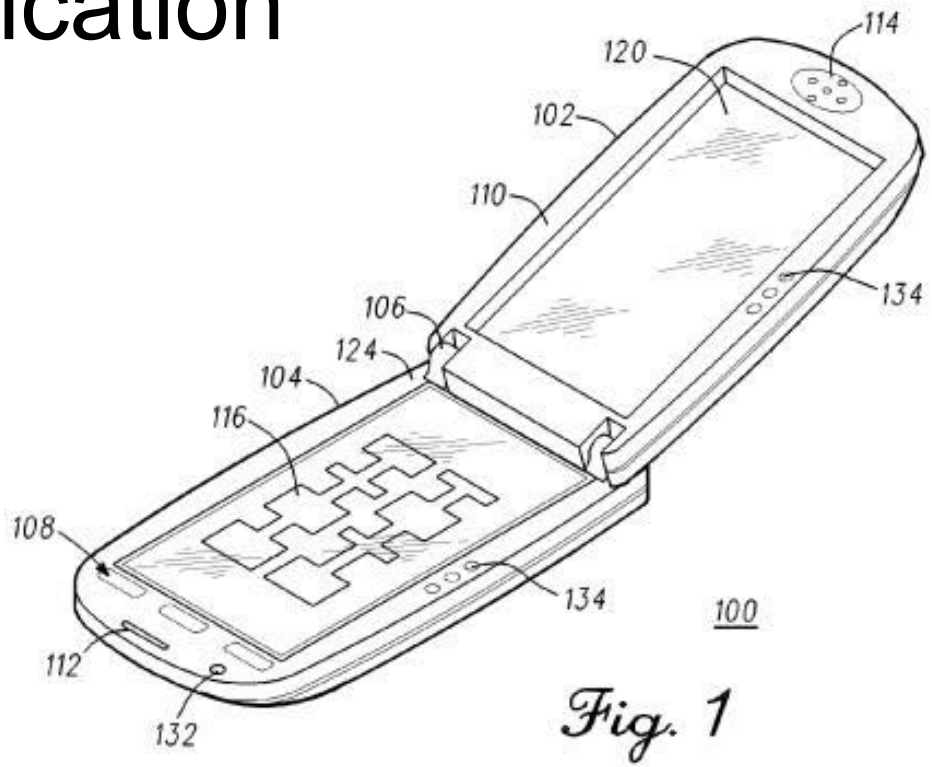


Fig. 1

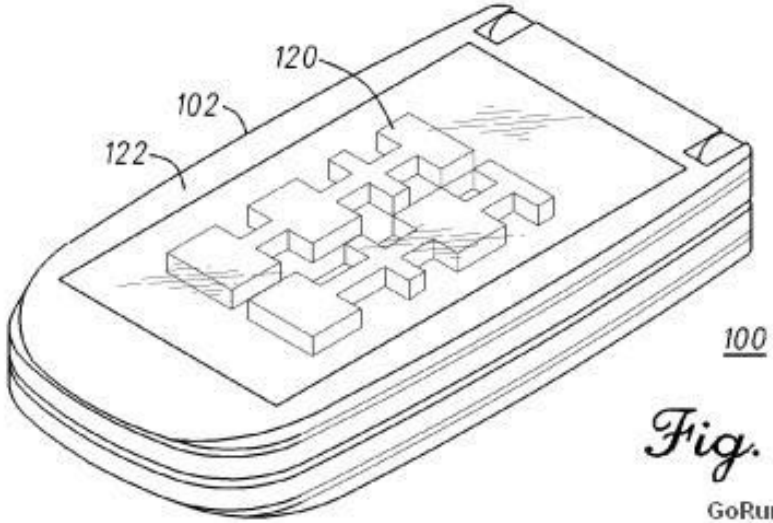
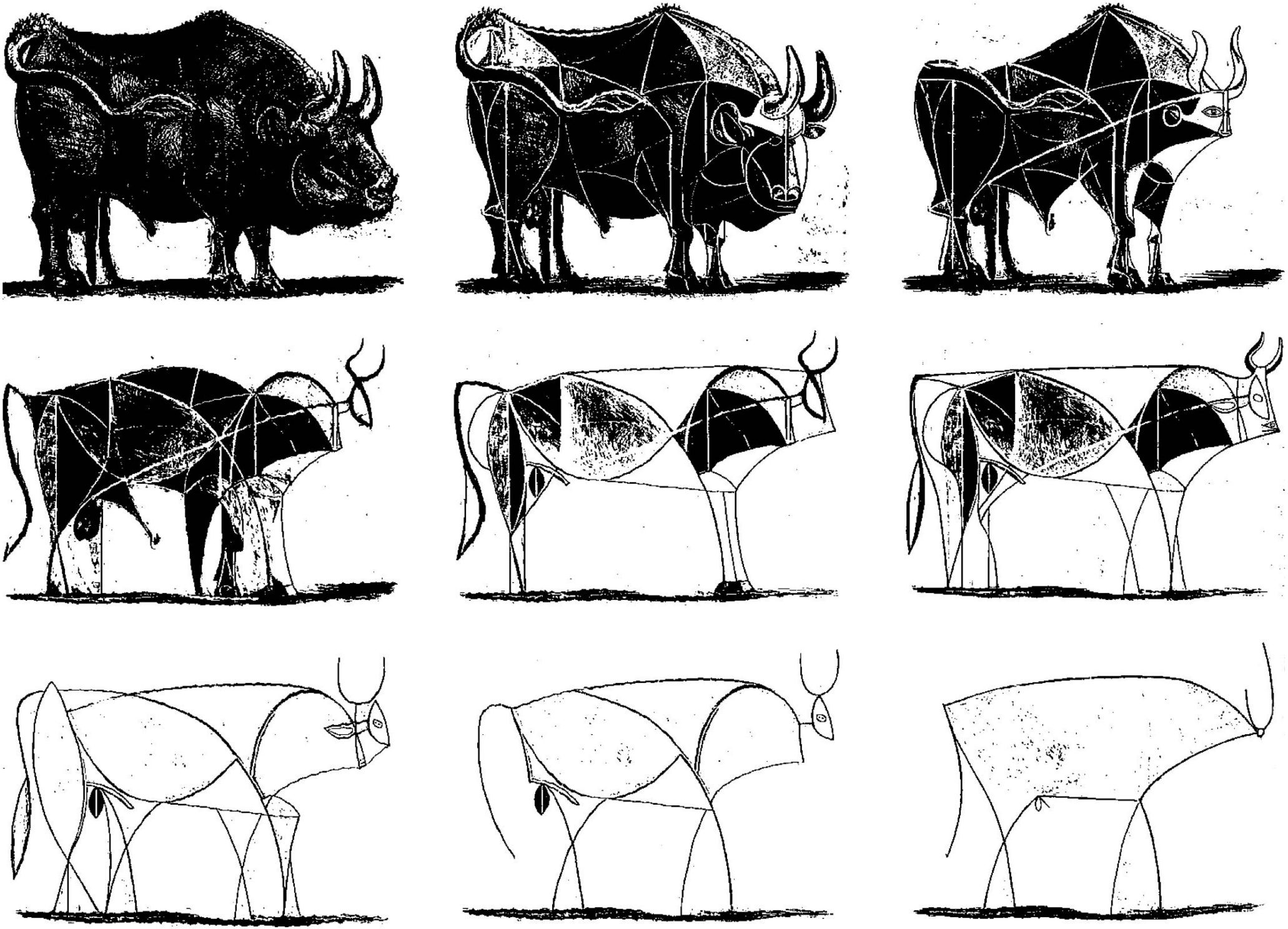


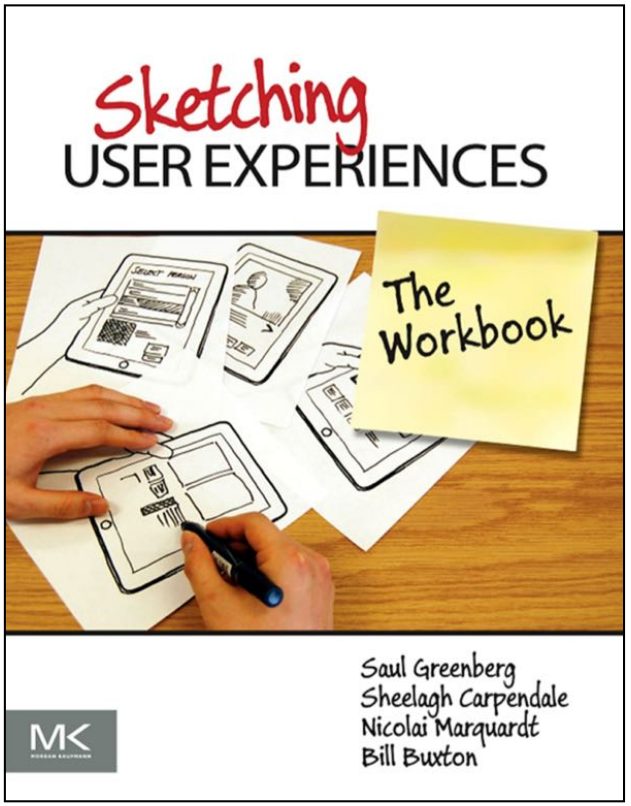
Fig. 2

GoRumors.com



Properties of Sketches

- Quick
- Timely
- Inexpensive
- Disposable
- Plentiful
- Clear vocabulary
- Distinct gesture
- Minimal detail
- Appropriate degree of refinement
- Suggest and explore rather than confirm
- Ambiguity



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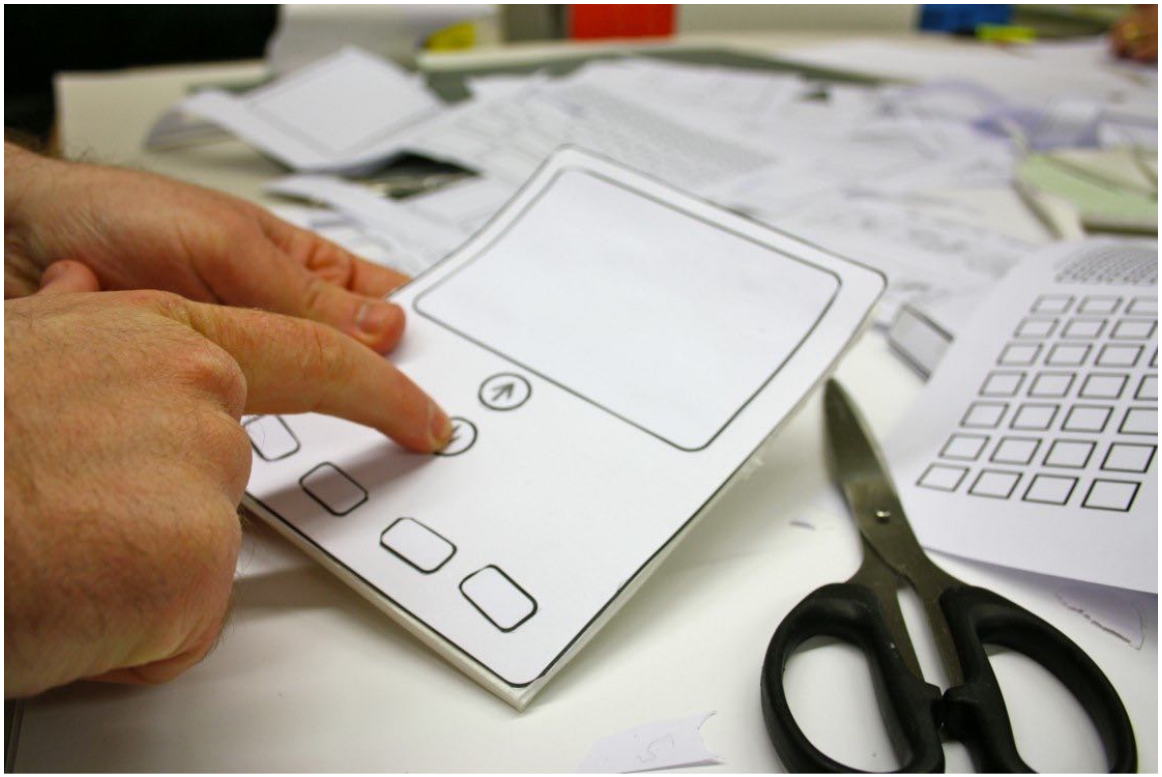
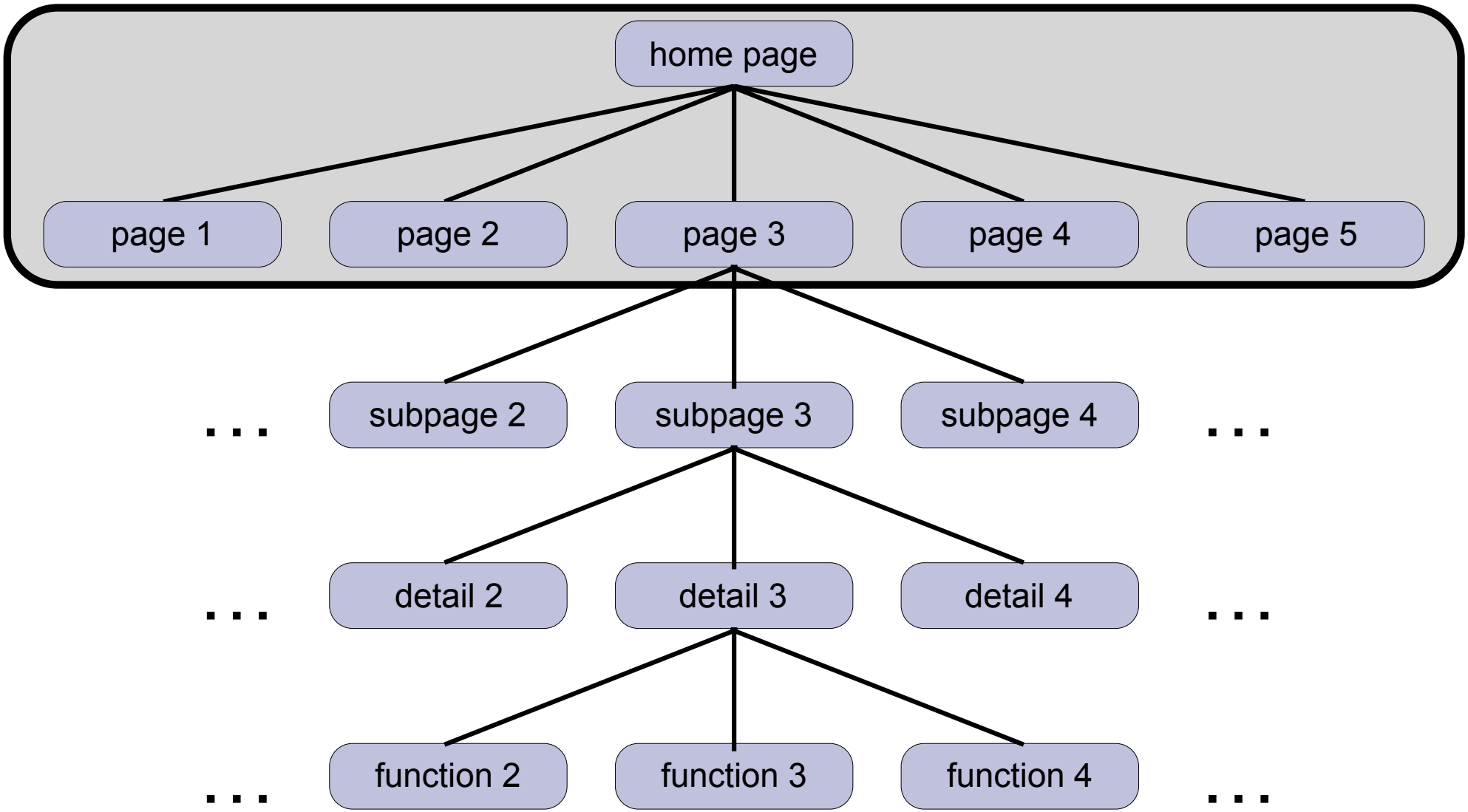
Resolution and Fidelity

- Houde, Stephanie und Charles Hill: What Do Prototypes Prototype? In: Helander, M., T. Landauer und P. Prabhu (Eds): Handbook of Human- Computer Interaction. Elsevier Science B.V., Amsterdam, 2. Auflage, 1997.

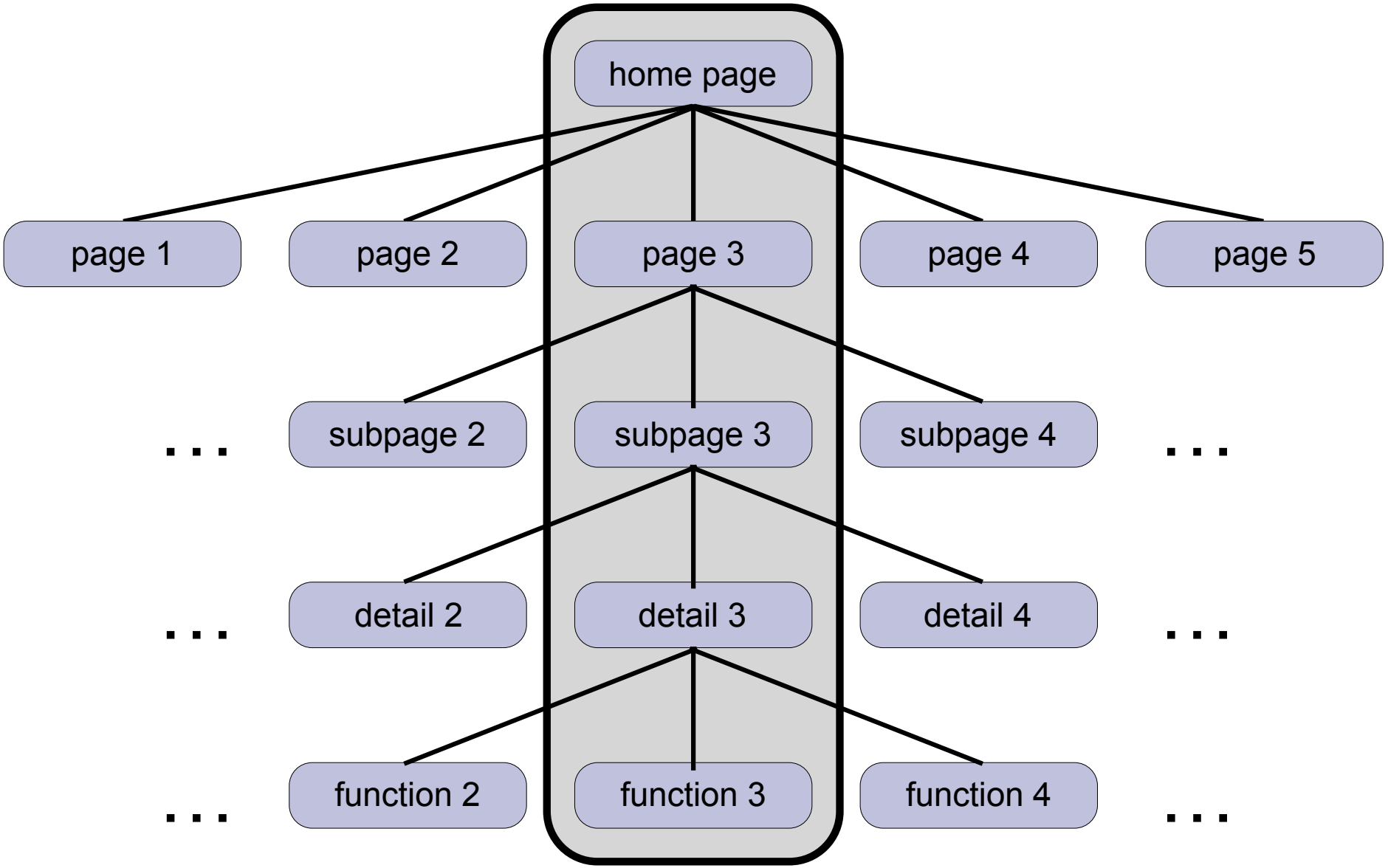
- ***Resolution*** = Volume of representation of final system in prototype (e.g. only one screen vs. complete system)
- ***Fidelity*** = Similarity of details in prototype implementation to final system (e.g. drawing sketch vs. photorealistic rendering)



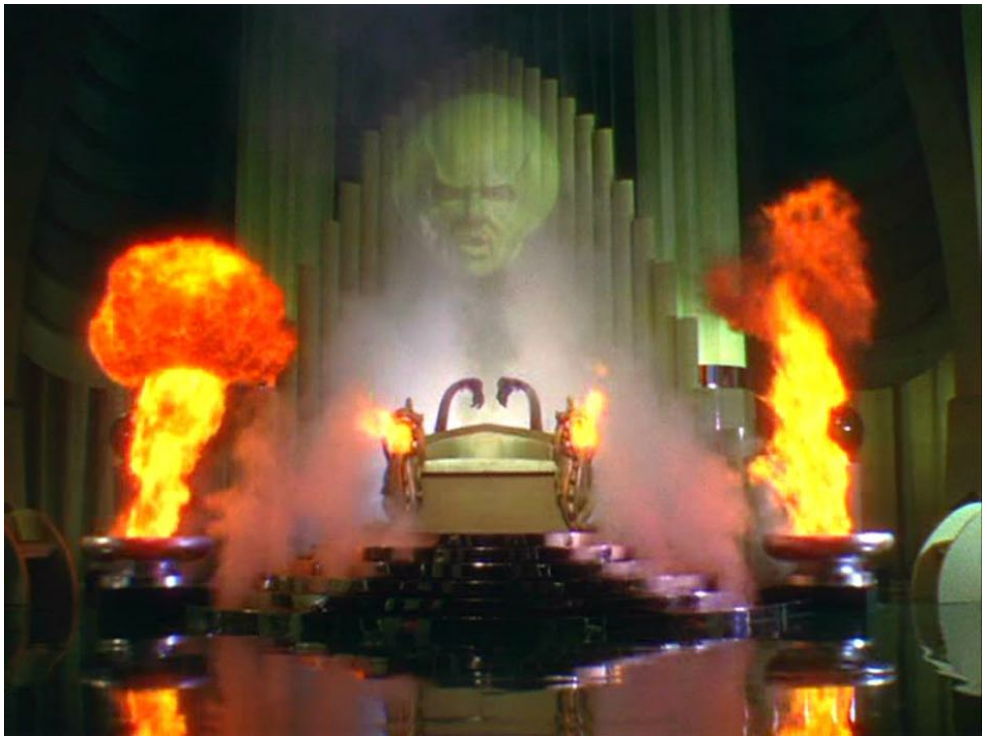
Horizontal Prototypes



Vertikal Prototypes



Wizard of Oz Prototypes



http://2.bp.blogspot.com/_QJDOQQGmSDU/TKwCEkgJscI/AAAAAAAADxY/LINhk8BF4pQ/s1600/wizard_of_oz_1092_wizard.jpg

http://dailycapitalist.com/wp-content/uploads/2012/07/Wizard-of-Oz.jpg

Wizard of Oz Prototype Example

Östergren/Juhlin, Stockholm University: *Soundpryer*, 2002-2008
http://mobility.dsv.su.se/projects/soundpryer/

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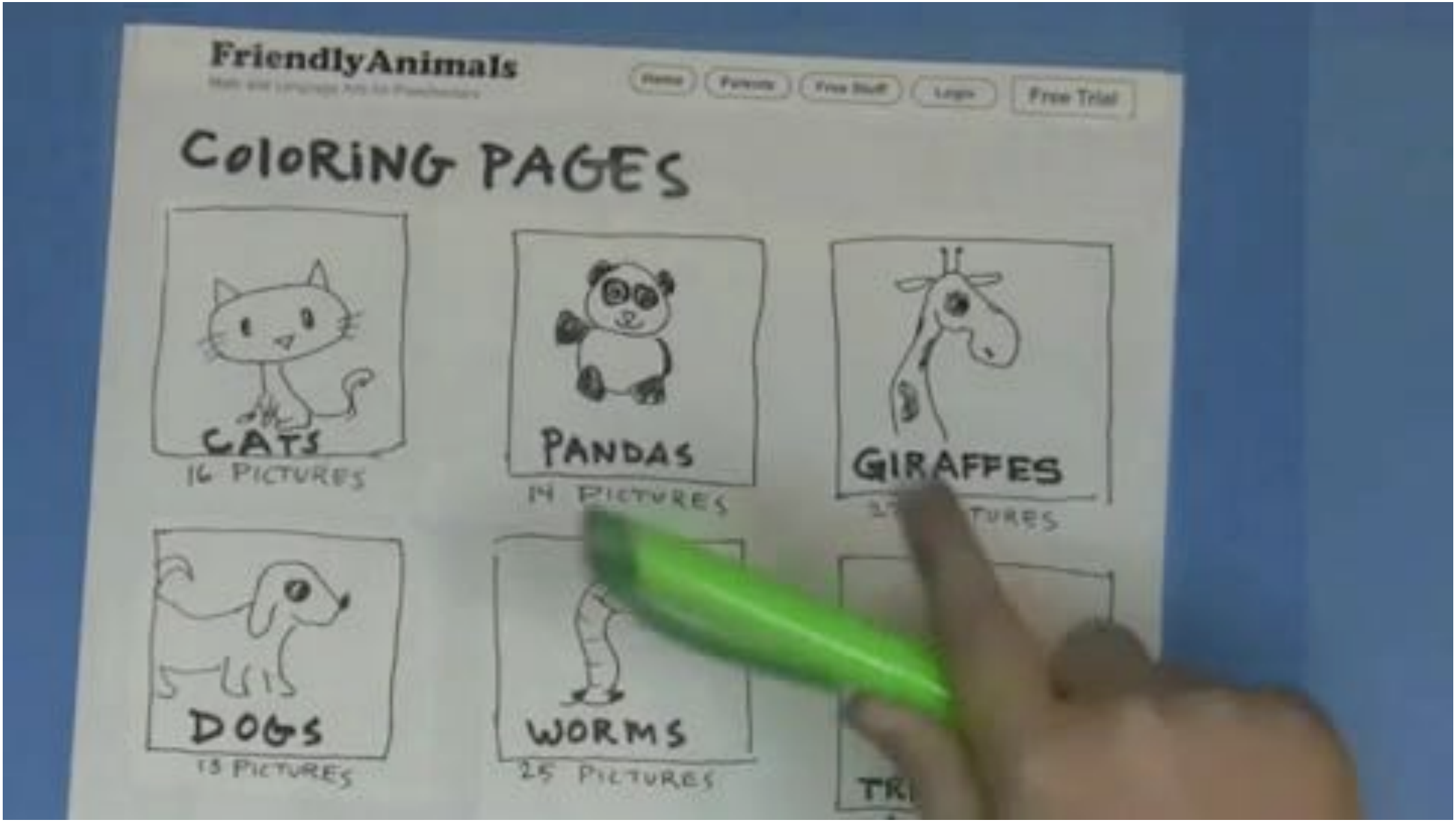
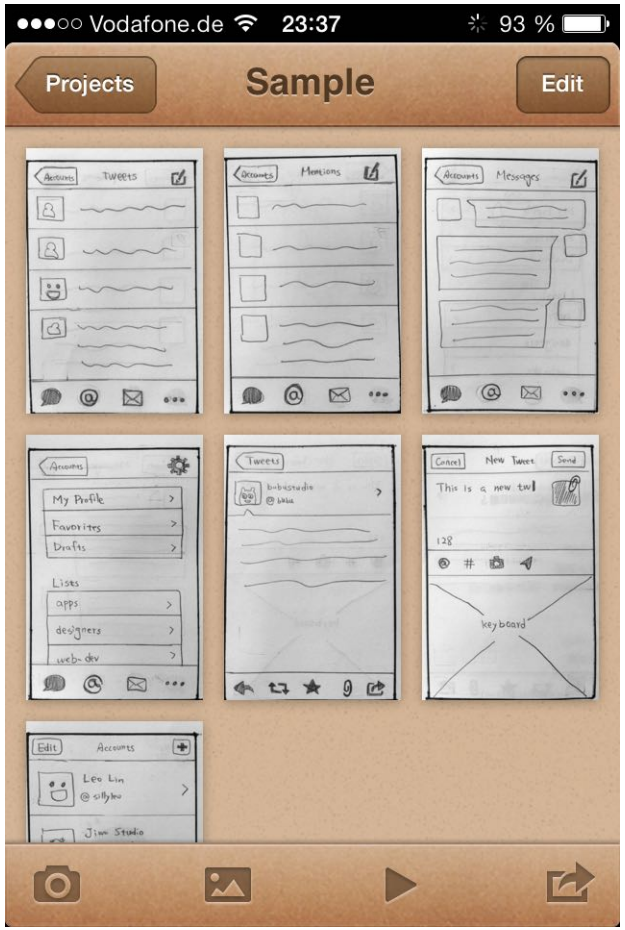


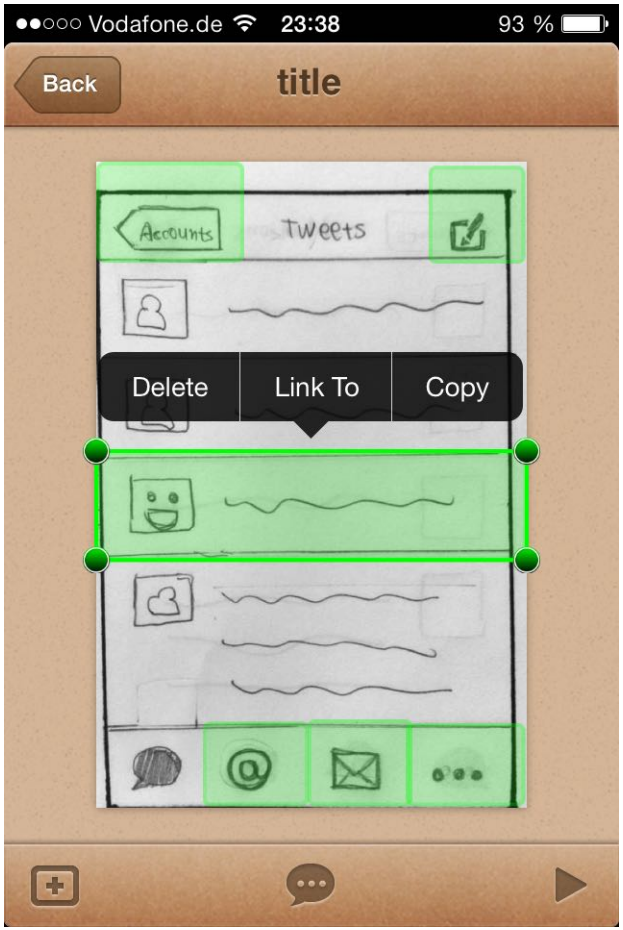
https://www.youtube.com/watch?v=9wQkLthhHKA

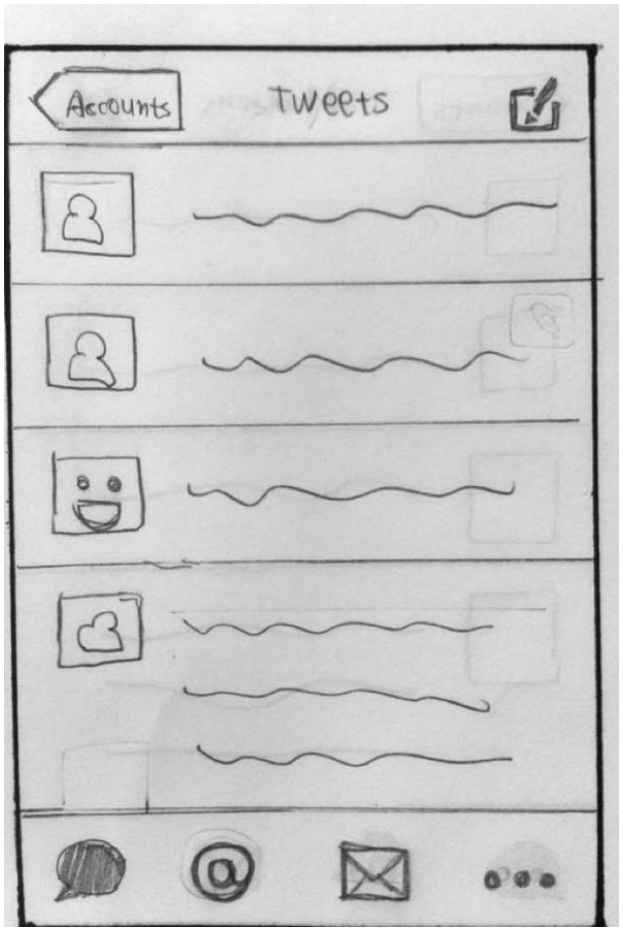
Paper Prototype of an Email Application

www.youtube.com/watch?v=GrV2SZuRPv0

POP App (Prototyping on Paper)





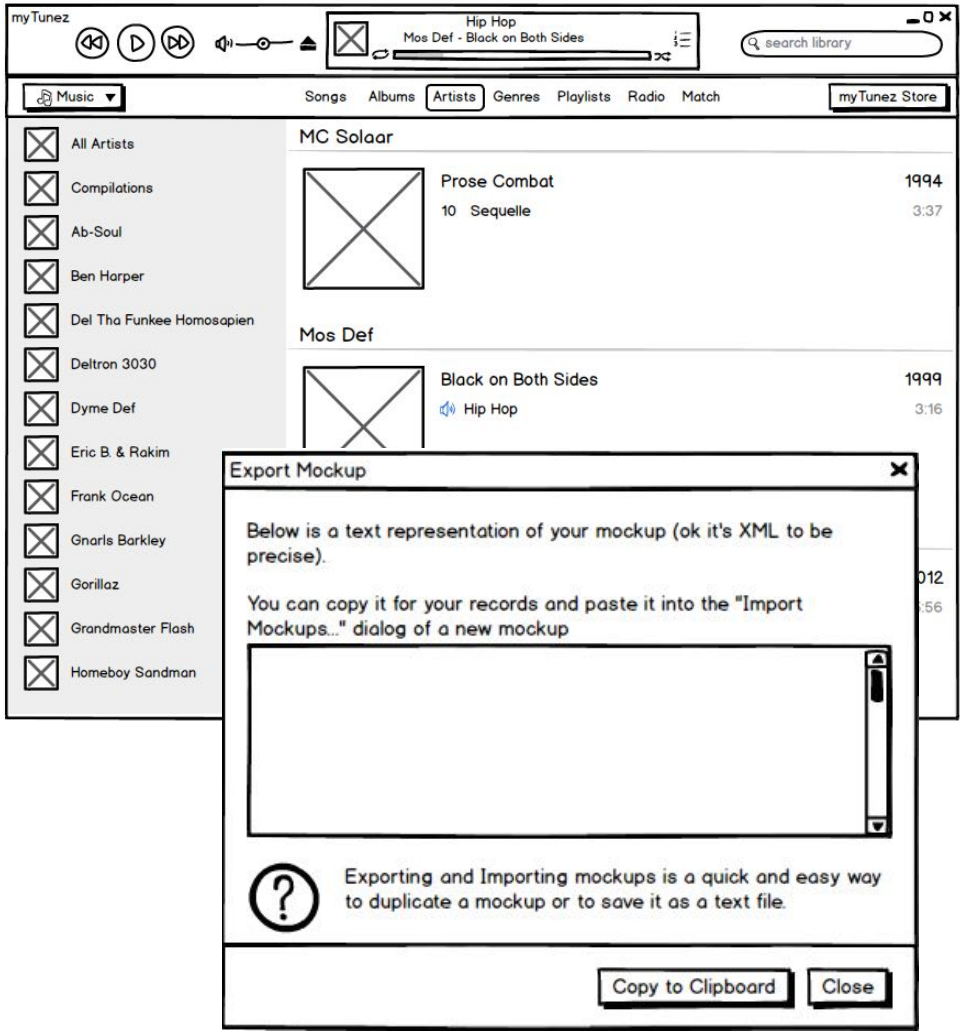


https://popapp.in

Rapid Prototyping & Wireframing Tools

- Software to create interface prototypes (“mockups”)
- Many systems available, examples: Axure, Balsamiq

www.axure.com



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Sun Microsystems: "Starfire"
1992 ->>> 2004
http://www.asktog.com/starfire/