Prototyping UX

From Sketch to Prototype

Alexander Wiethoff
Ludwig-Maximilians University of Munich (LMU)

An original type, form, or instance that serves as a model on which later stages are based and judged.

American Heritage Dictionary

source: [1]

INTERACTION DESIGN

photo credits © bill verplank

Three main goals

1.) Understanding a design context

2.) Exploring and evaluating ideas

3.) Communicating ideas

source: [1]

Three main purposes

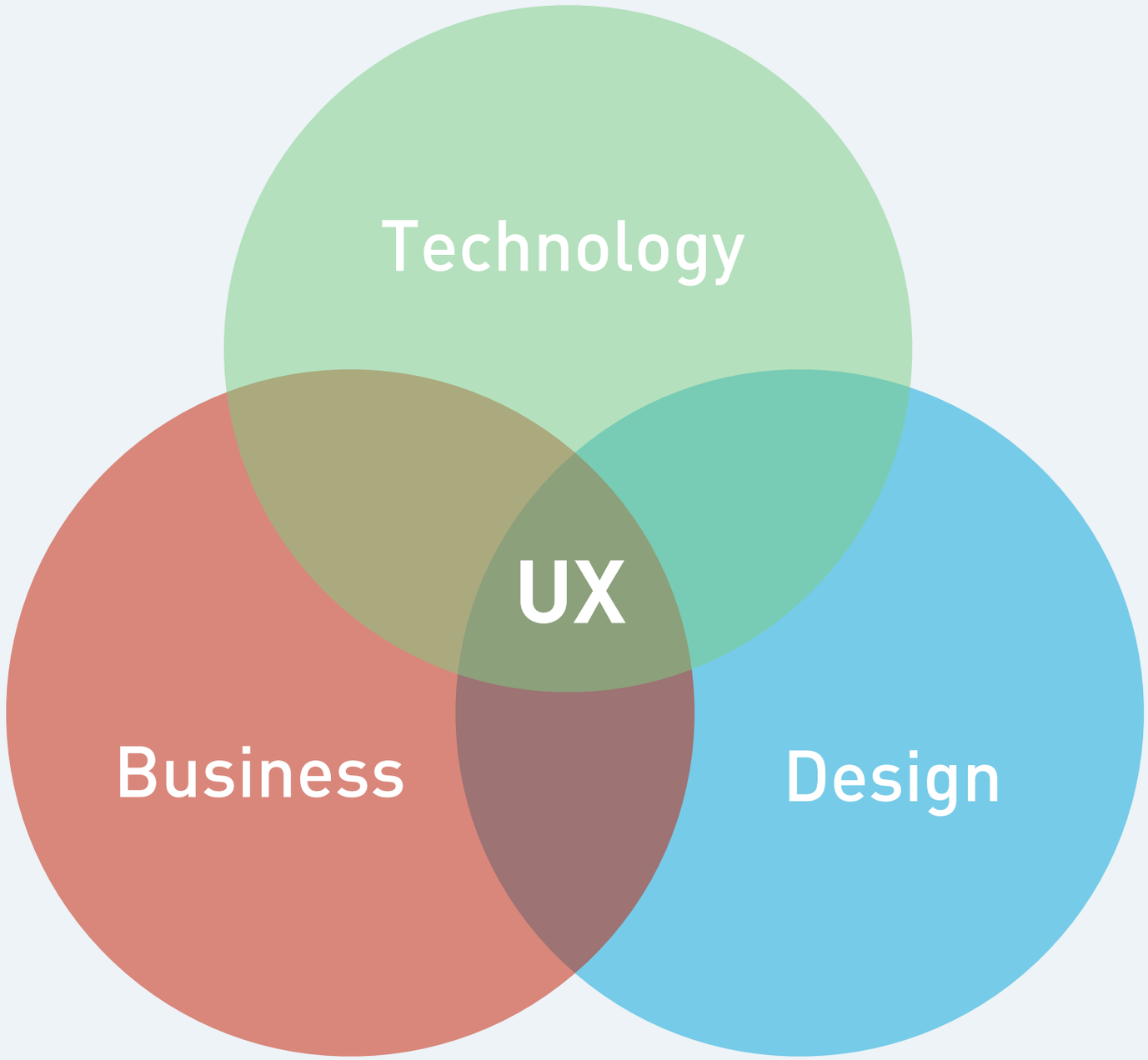
1.) Screen based interaction

2.) Interactive products

3.) Technology enabled services

source: [1]

User Experience Design



©Peter Morville
http://semanticstudios.com

User Experience Design

©Peter Morville
http://semanticstudios.com

Getting the right Design and the Design right...

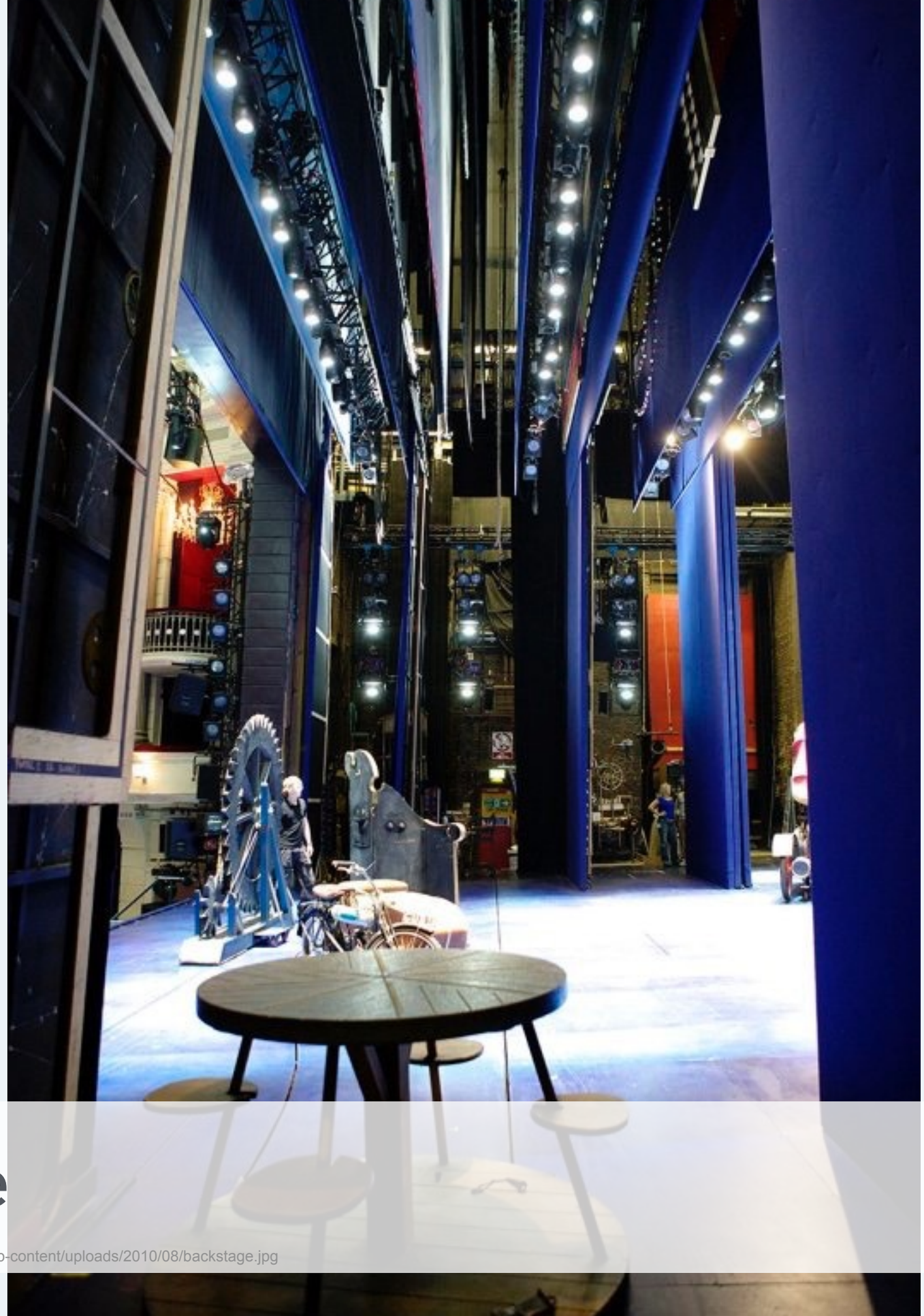
Bill Buxton - Sketching User Experiences

source: [1]

Front Stage

http://www.markabull.com/wp-content/uploads/2011/01/stage.jpg

Back Stage



http://blog.entrepreneurthearts.com/etablog/wp-content/uploads/2010/08/backstage.jpg

User Interface

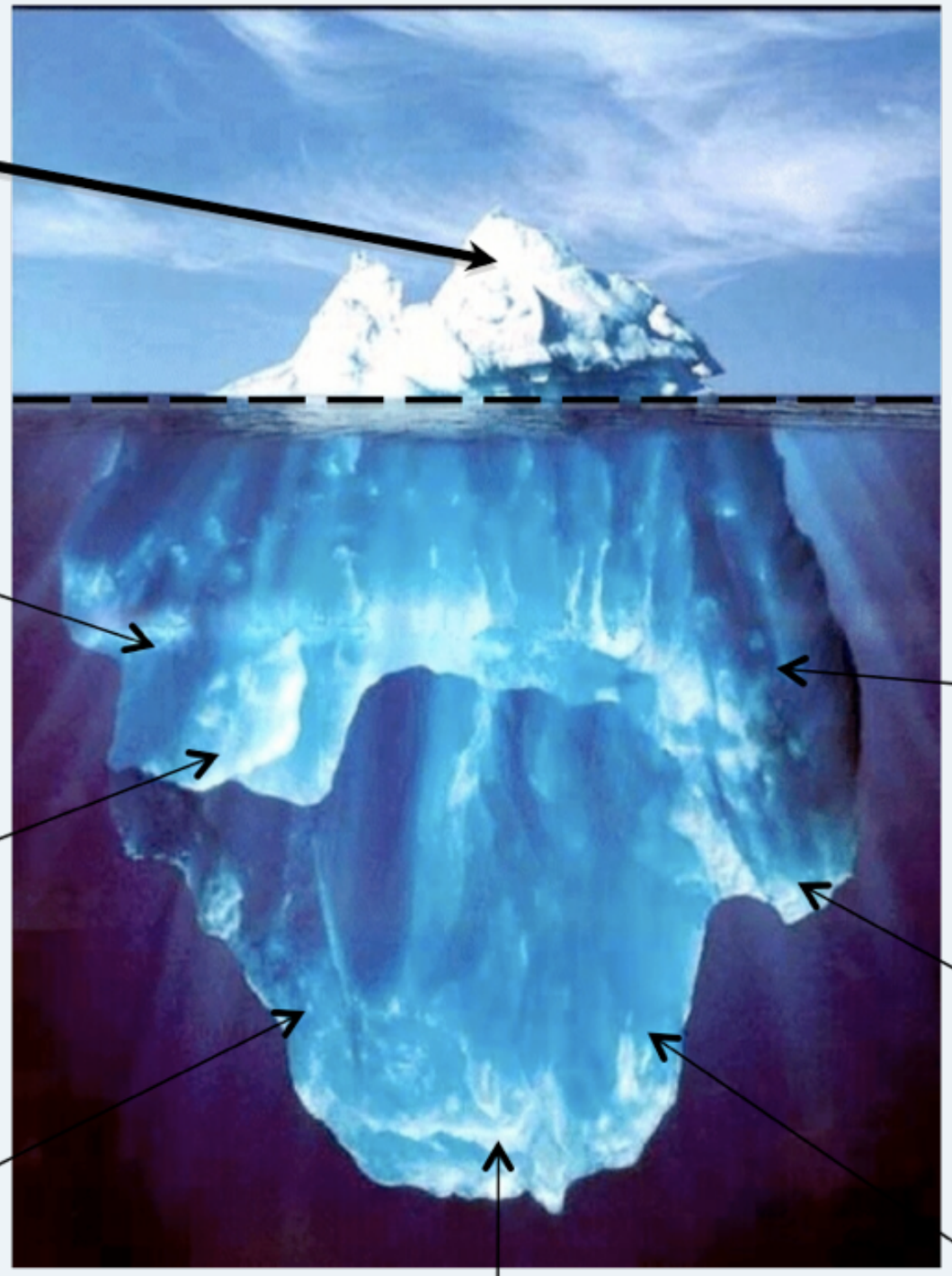
Visible

Behind the Scenes

Capturing

Connecting

Combining



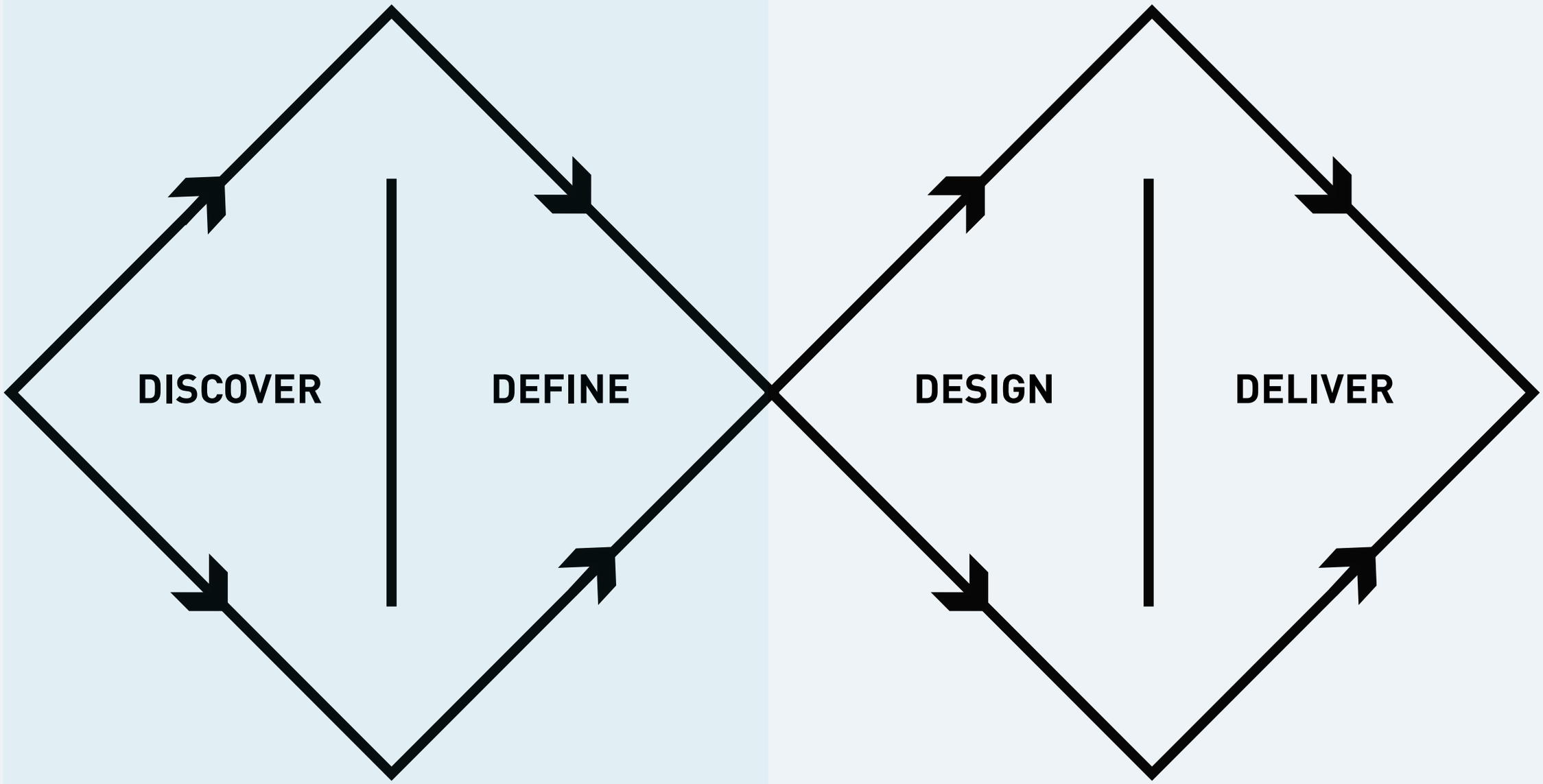
Contextualizing

Transferring

Coordinating

Storing

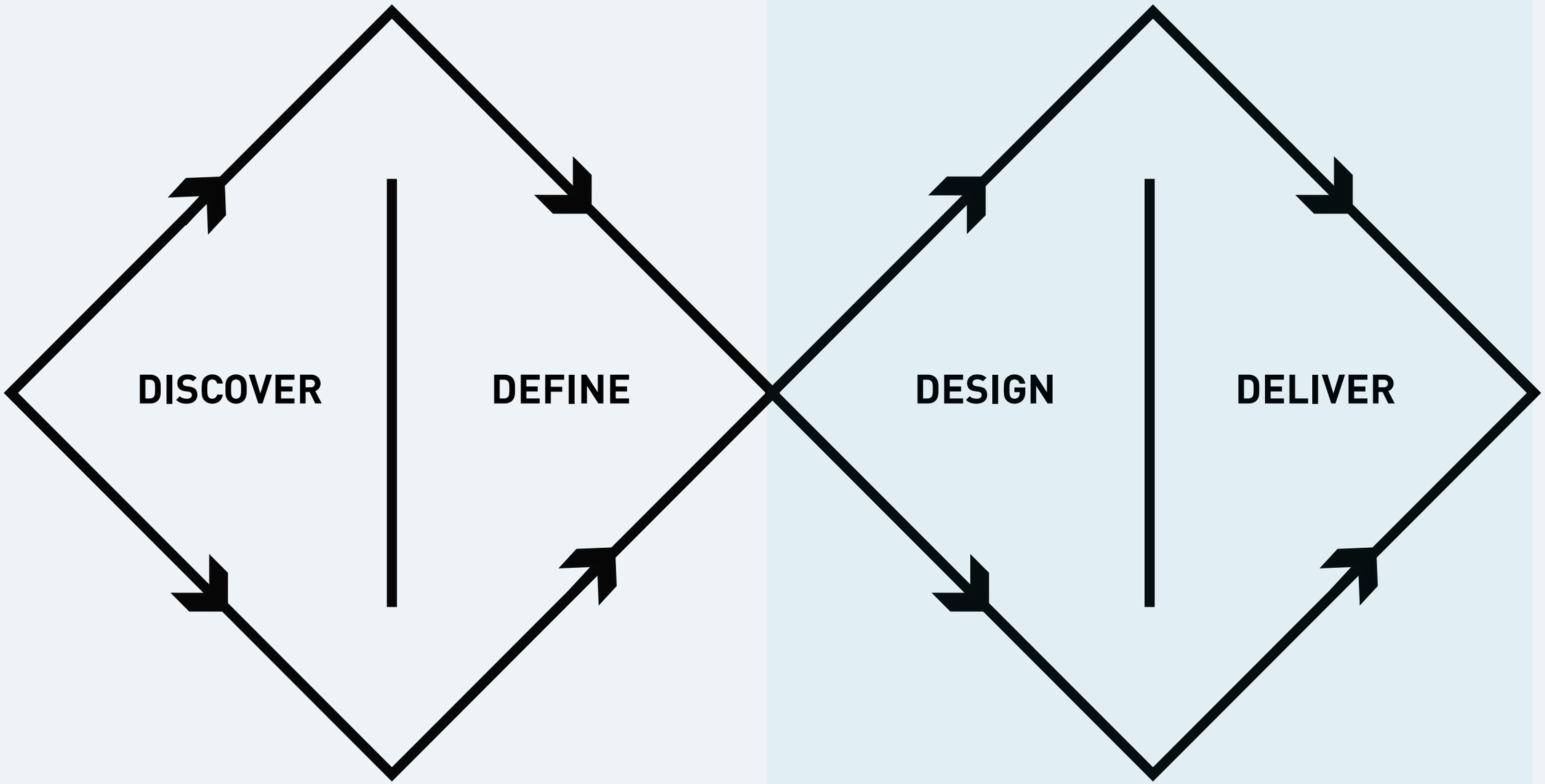
Double Diamond



Why? and How?

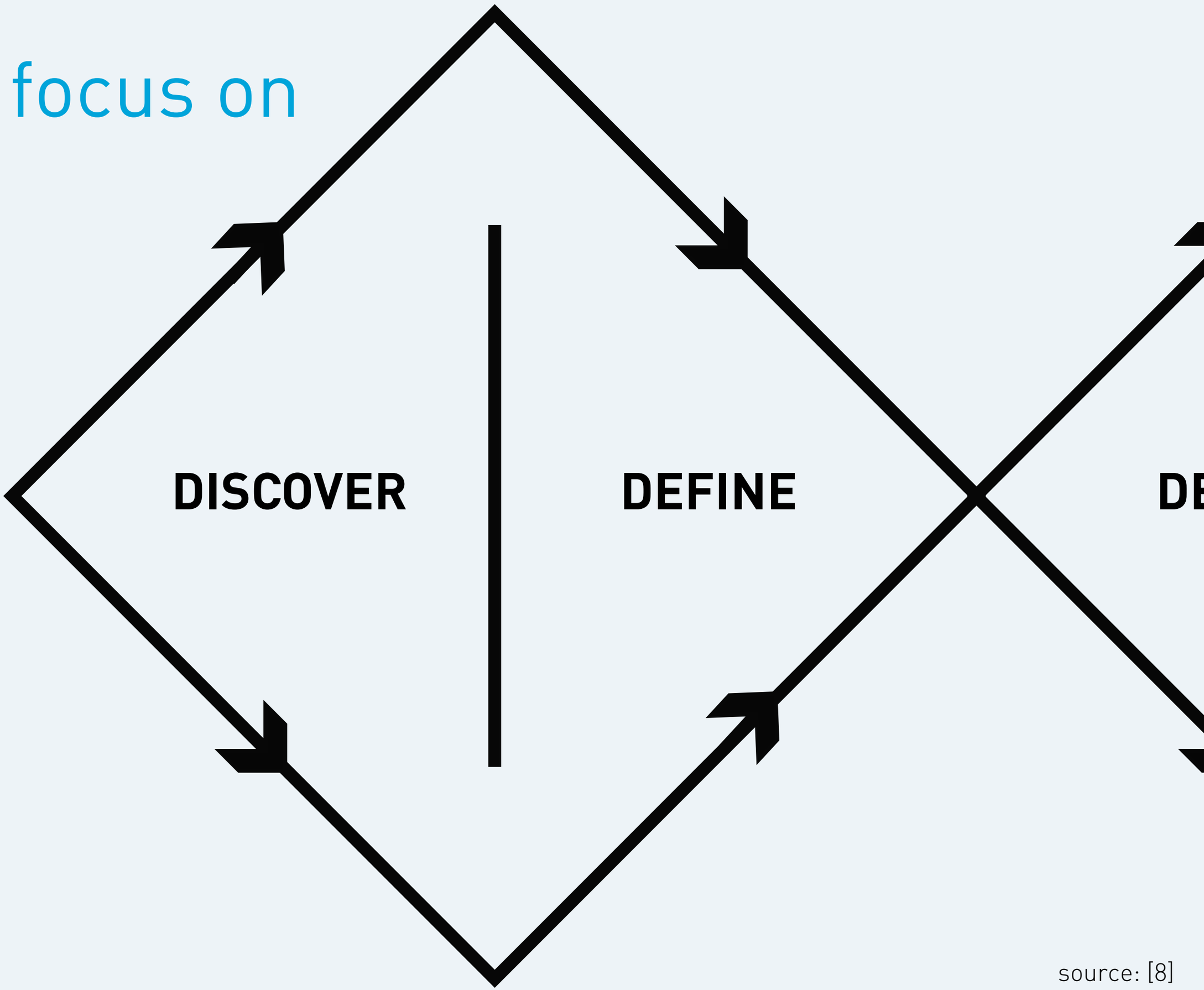
source: [8]

Double Diamond



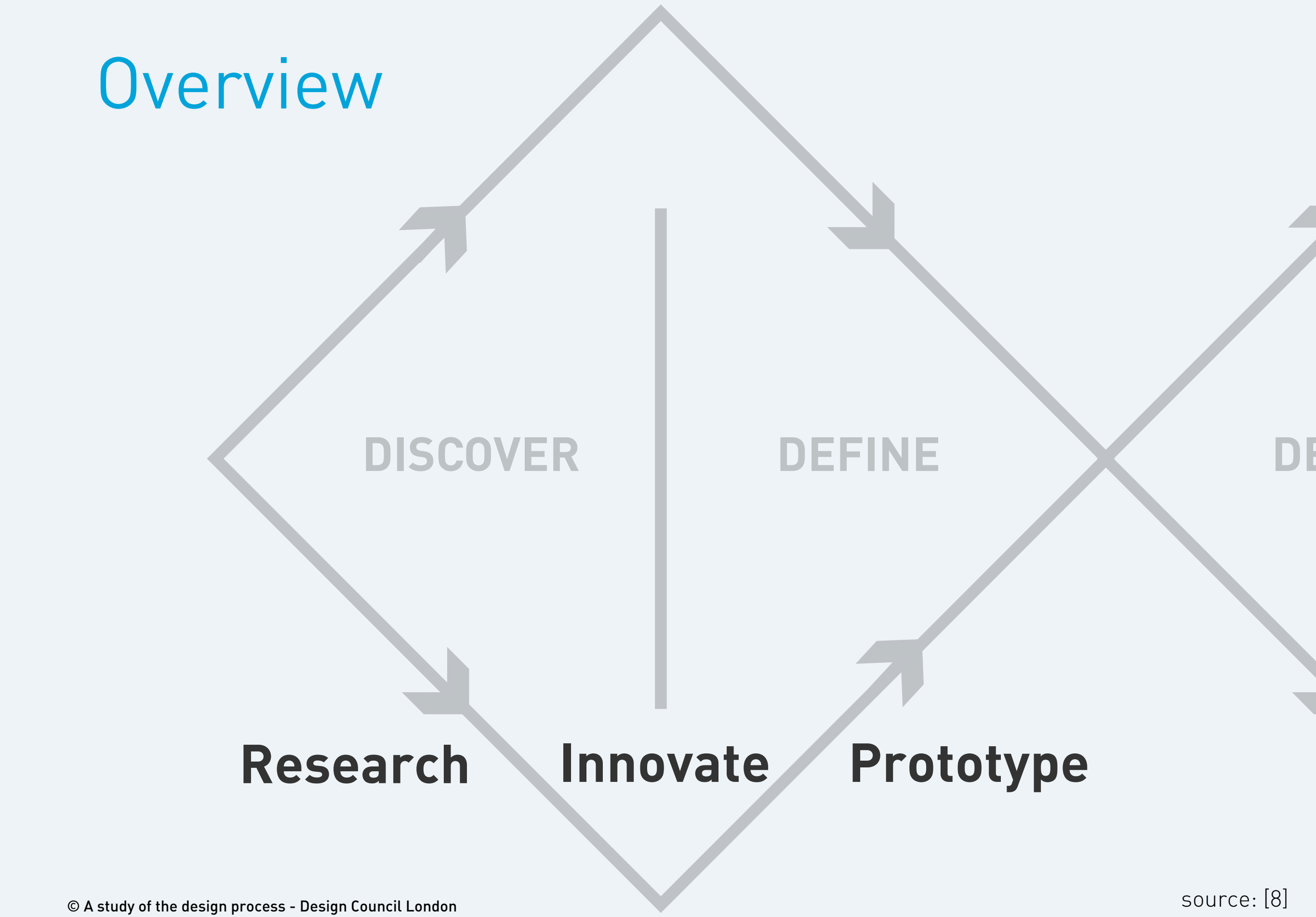
source: [8]

We focus on



source: [8]

Overview



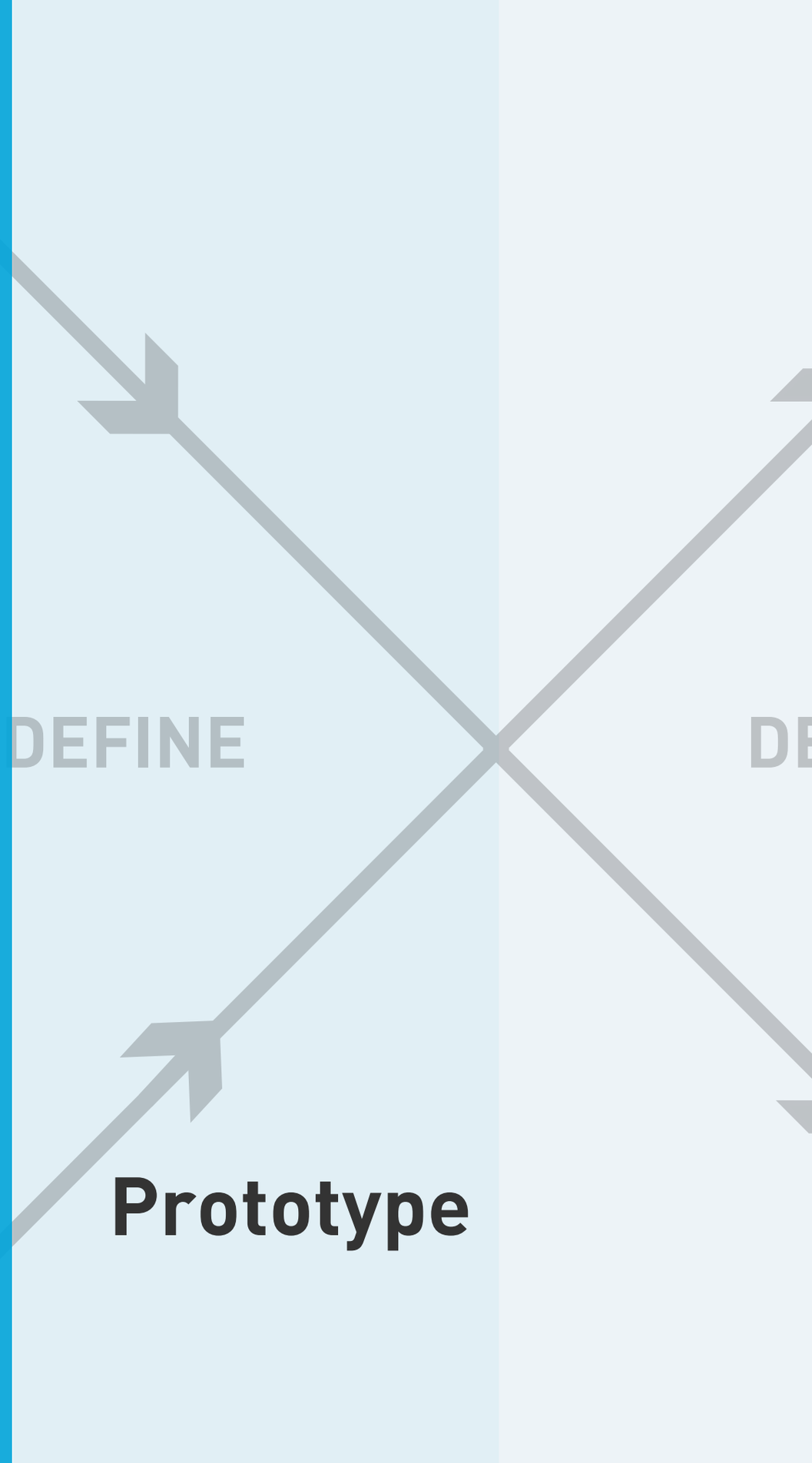
© A study of the design process - Design Council London

source: [8]

Overview

Tell a story

Make it tangible



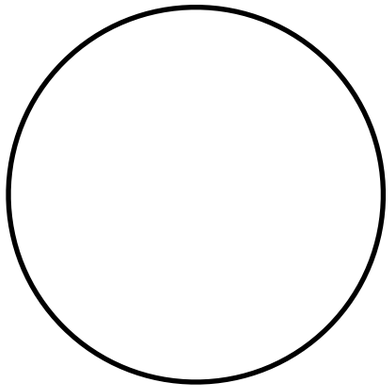
For the Designer:	Exploration Visualisation Feasibly Inspiration Collaboration
For the End User:	Effectiveness / Usefulness A change of viewpoint Usability Desirability
For the Producer:	Conviction Specification Benchmarking

source: [5]

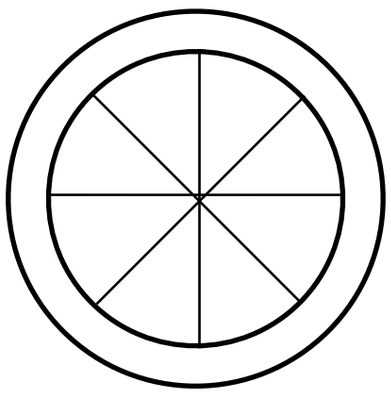
It’s really hard to design products by focus groups. A lot of times, people don’t know what they want until you show it to them.

Steve Jobs

Fidelity v. Resolution



low resolution
low fidelity



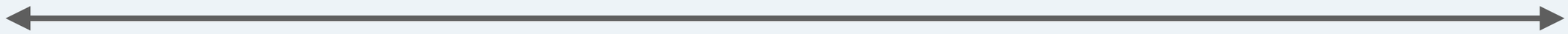
high resolution
low fidelity

high resolution
high fidelity

source: [5]

Low Fidelity

High Fidelity

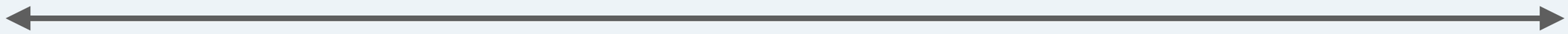


Open Discussion	Sharp Opinions
Prompting Required	Self Explanatory
Quick and Dirty	Deliberate and Refined
Early Validation	Concrete Ideas

source: [5]

Low Resolution

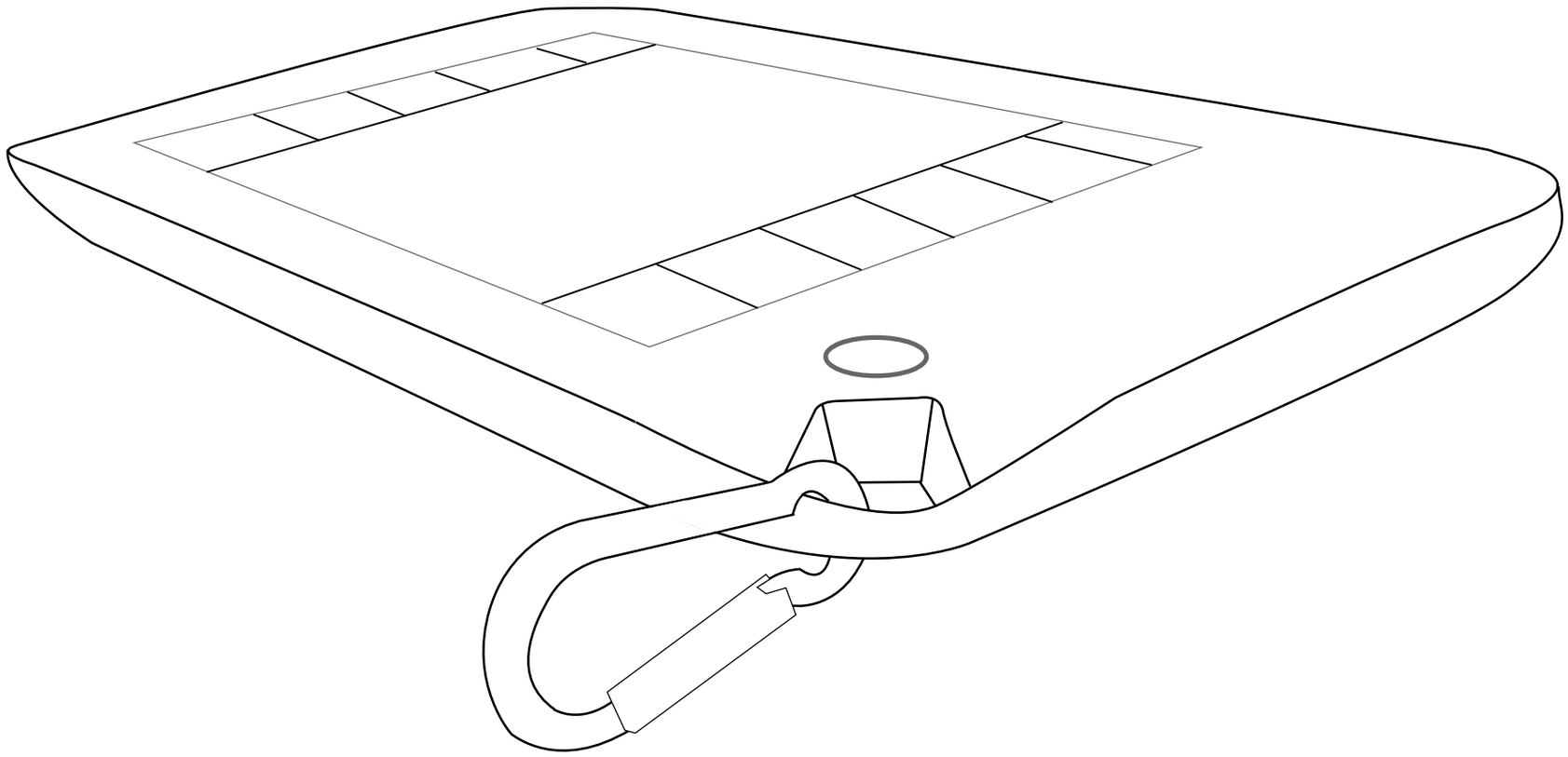
High Resolution



Less Details	More Details
Focus on core interactions	**Focus on the whole**
Quick and Dirty	Deliberate and Refined
Early Validation	Concrete Ideas

source: [5]

1st Iteration
low-res/low-fi

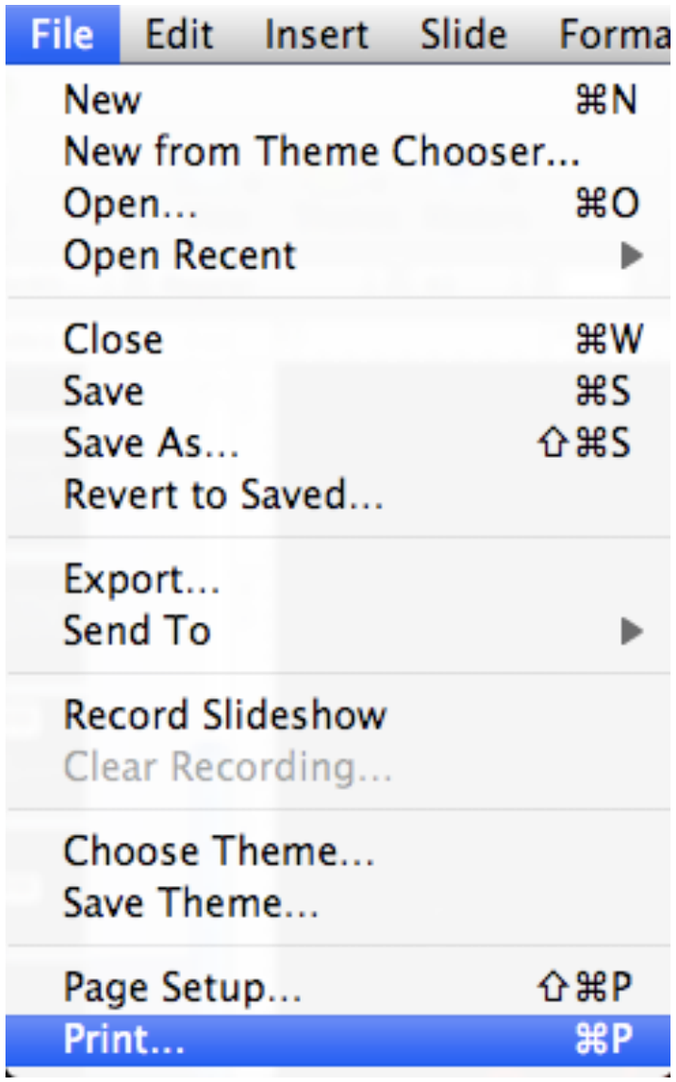


4th Iteration
high-res/high-fi

80/20 rule

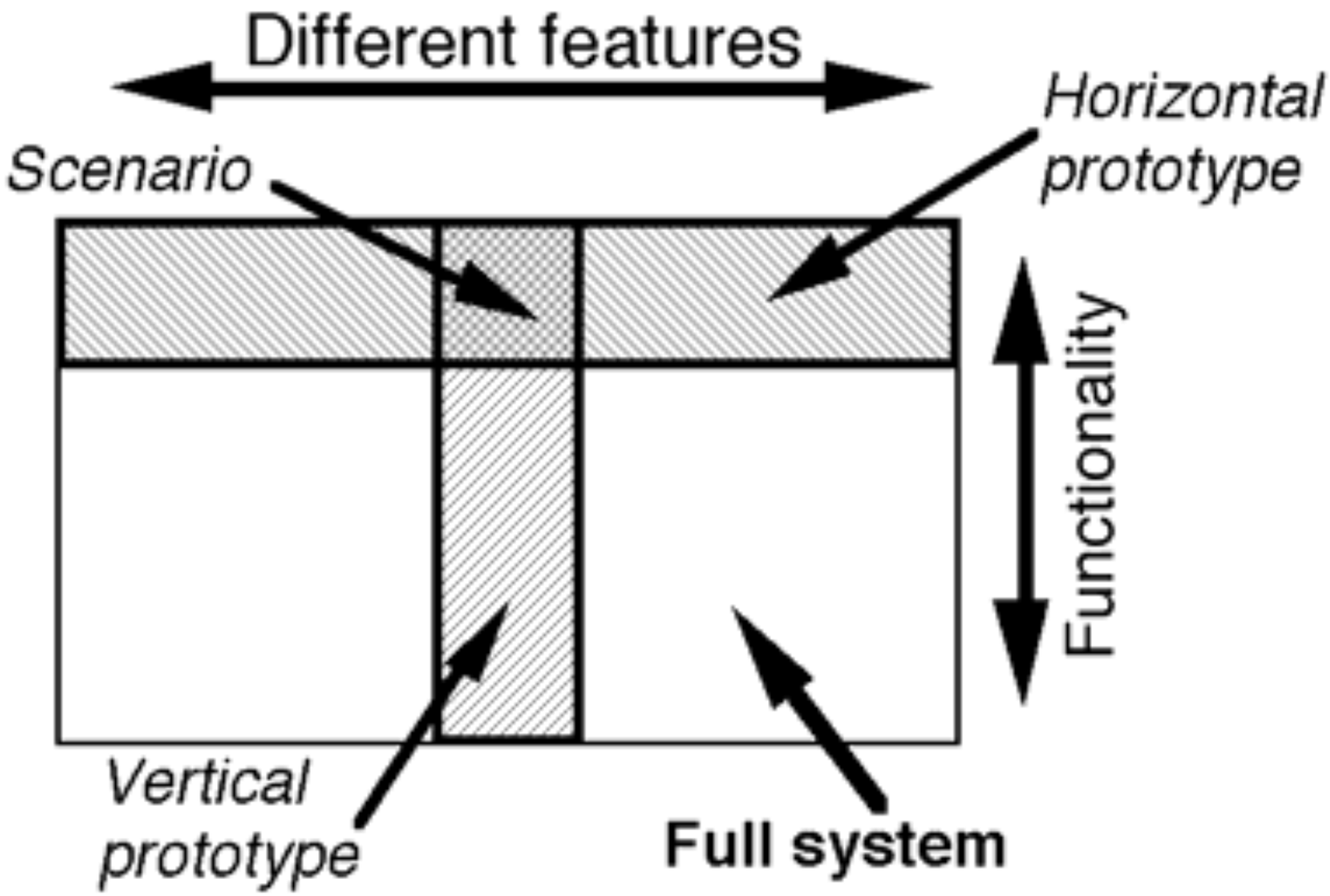
http://www.swissknifeshop.com/media/catalog/product/cache/1/image/5e06319eda06f020e43594a9c230972d/v/m/vm_53831--91_sol_front_ax1000.jpg

source: [7]



A principle for setting priorities: users will use 20% of the features of your product 80% of the time. Focus the majority of your design and development effort (80%) on the most important 20% of the product.

source: [7]



Horizontal vs. Vertical Prototype

source: [7]

https://media.nngroup.com/media/editor/2012/12/10/guerrilla_scenario_fig.gif

Paper-prototyping

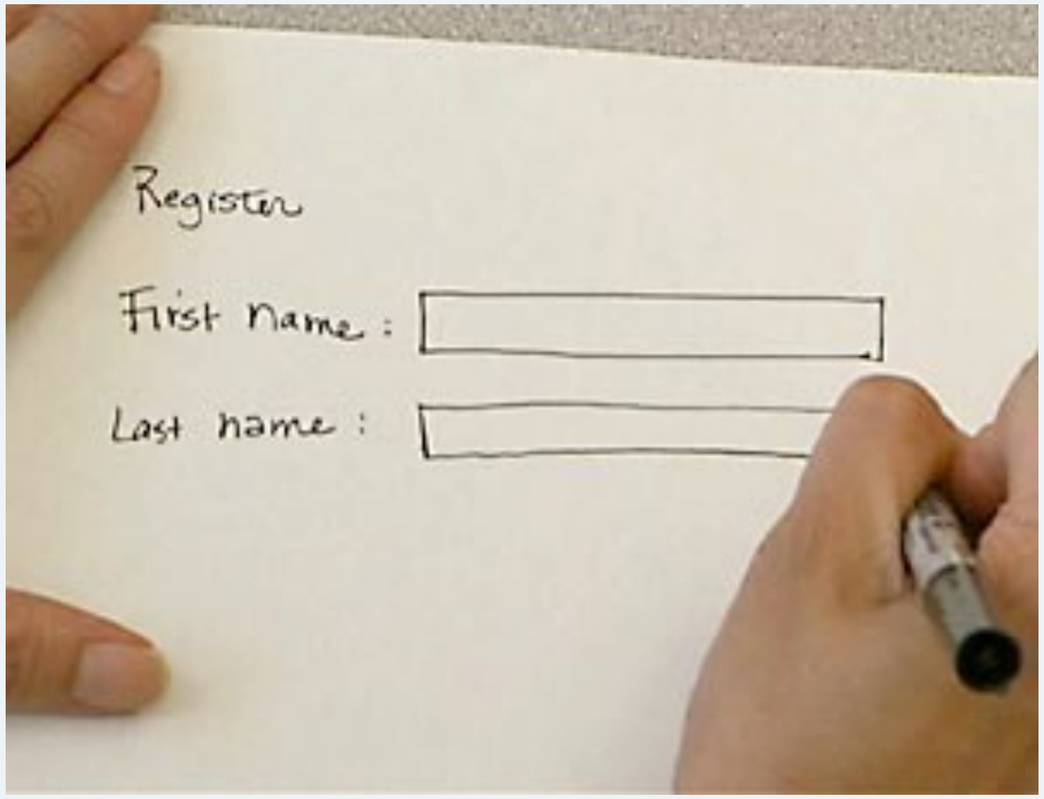
What is it?

Paper prototyping is a widely used method in the user-centered design process, a process that helps developers to create products/screen based applications that meets the user's expectations and needs.

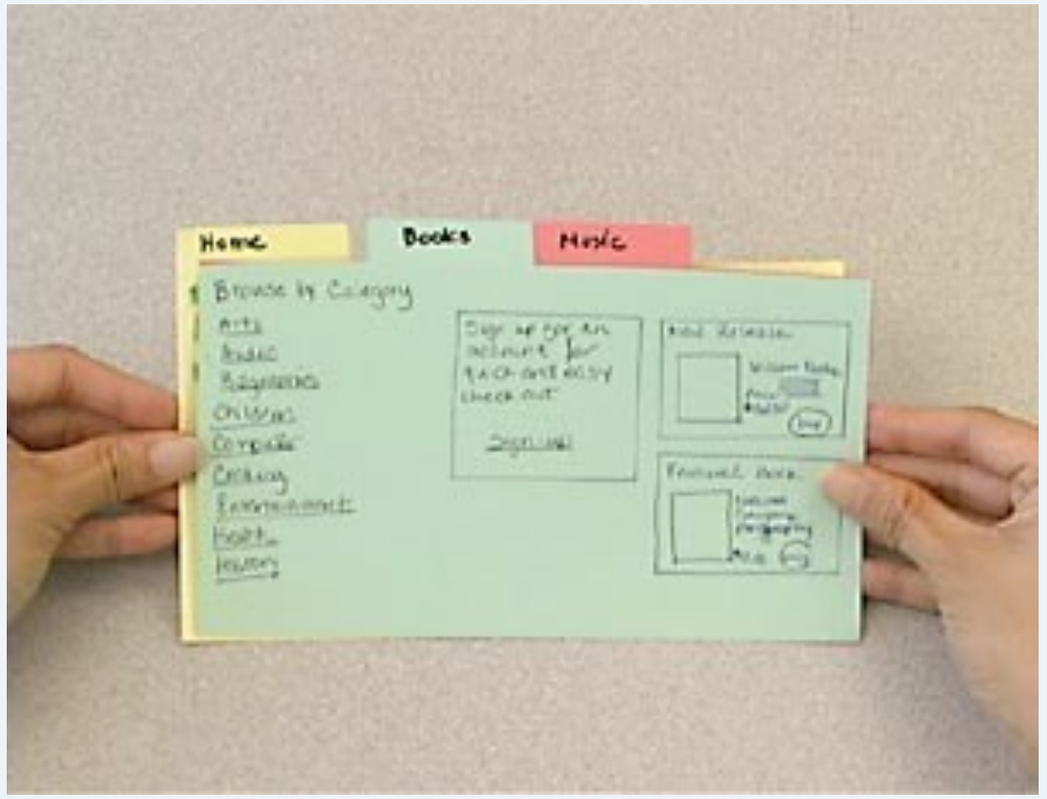
It is **throwaway prototyping** and involves creating rough, even hand sketched, drawings of an interface to use as prototypes, or models, of a design.

History

Paper prototyping started in the mid 1980s and then became popular in the mid 1990s when companies such as IBM, Honeywell, Microsoft, and others started using the technique in developing their products.



Paper prototype of a typical form-filling screen



Paper prototype of a tabs-based design

User test of a low-fidelity paper prototype of a website

Typical set-up of the usability laboratory for a test session with a paper prototype

photo credits © NN Group

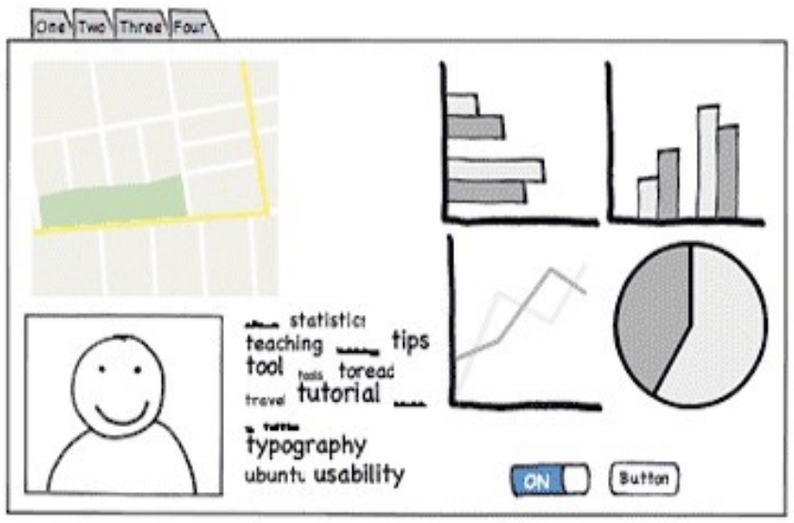
User test of a device-based interaction

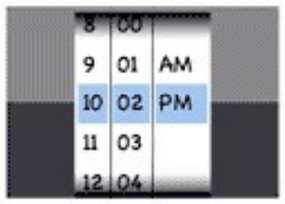
User test of a high-fidelity paper prototype of a homepage.

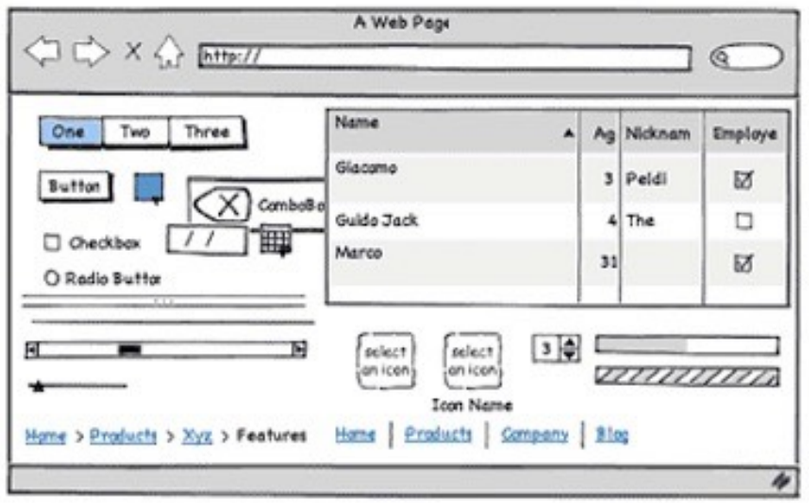
Testing hardware user interfaces: mockup of a kiosk.

photo credits © NN Group

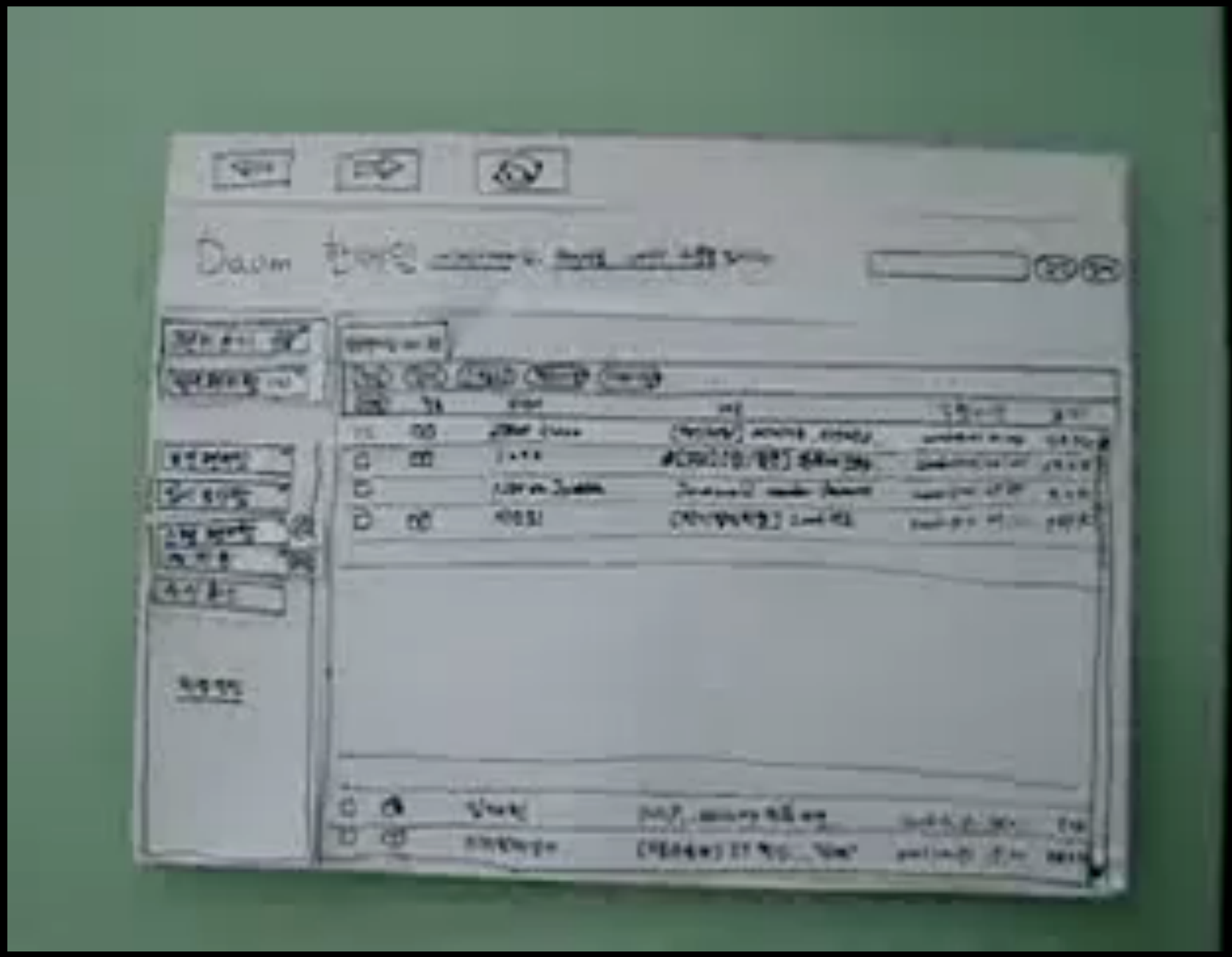
NN Training-Video







http://www.balsamiq.com/products/mockups



Source: YouTube

Video-prototyping

http://2.bp.blogspot.com/-CBtuuif7rZ4/U0MBJkCUfgI/AAAAAAAAEi4/fYp1bJOcdVY/s1600/Canon+XF205+left+side+view.jpg

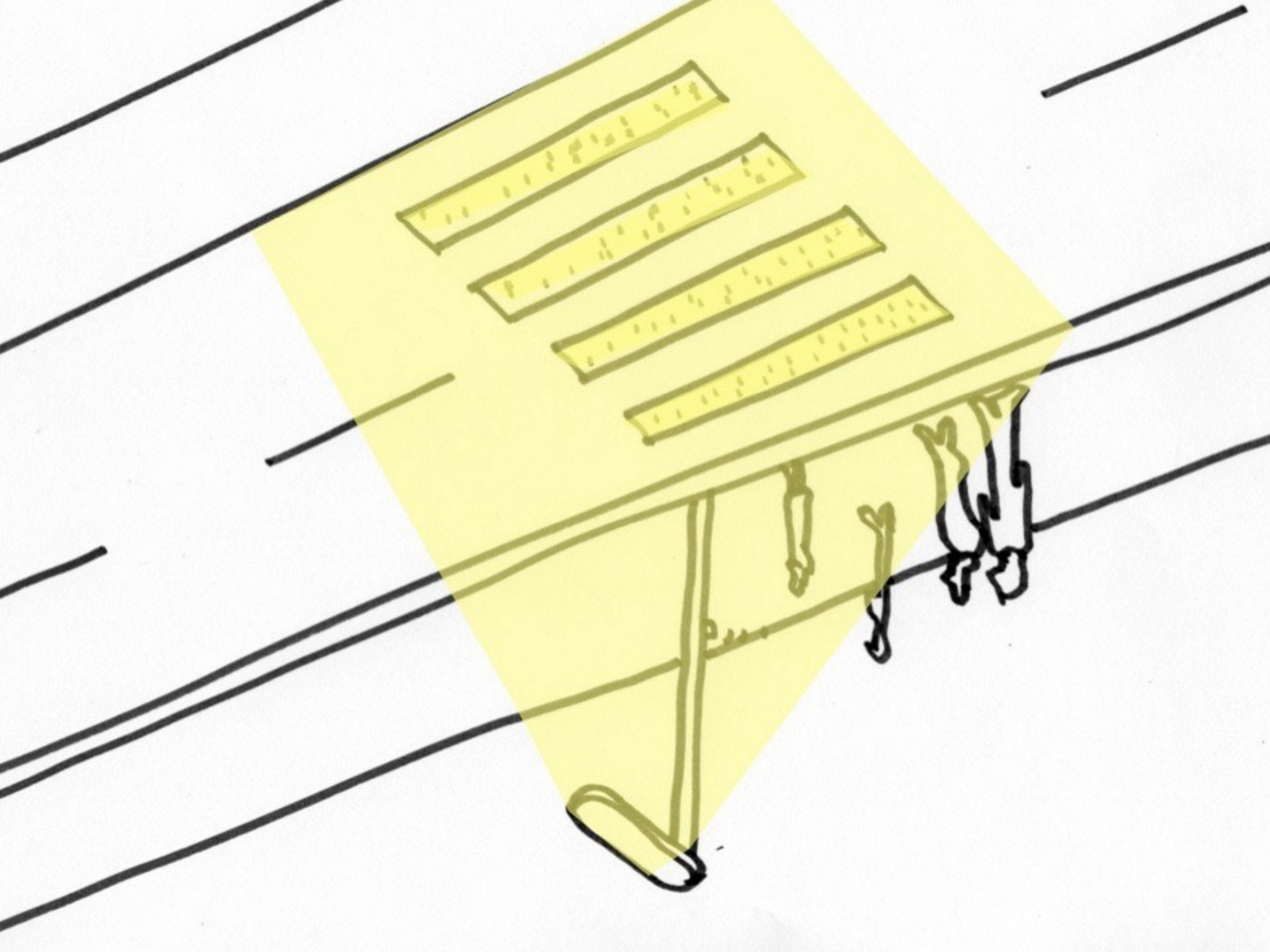
Acting out the Scenario

Quick Kiosk Mock-up

low resolution

high fidelity

(crossing on demand)



Zebra Zone

video© CIID

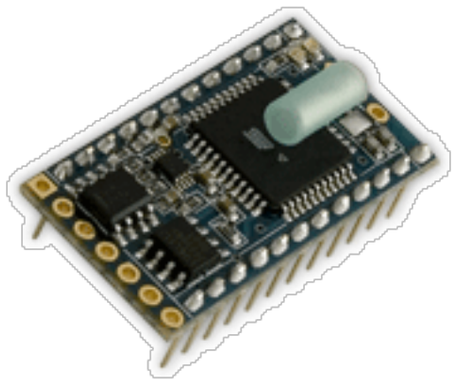
The Smoke & Mirror Approach

image© CIID

Sketching with Hardware

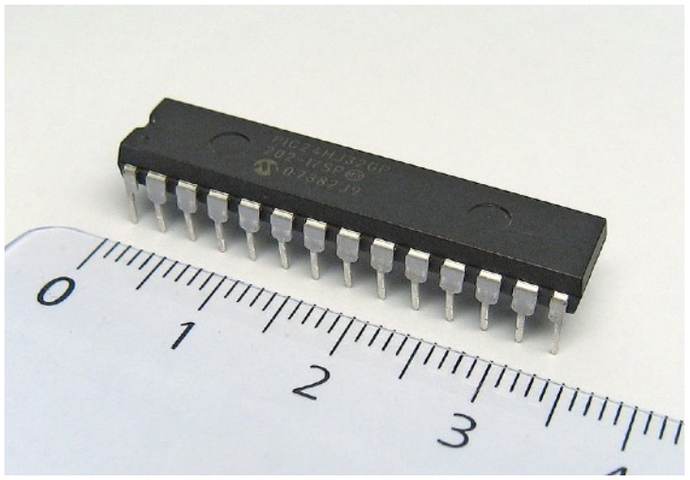
photo credits © alexander wiethoff

basic stamp



bx 24

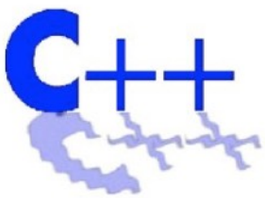
basic atom



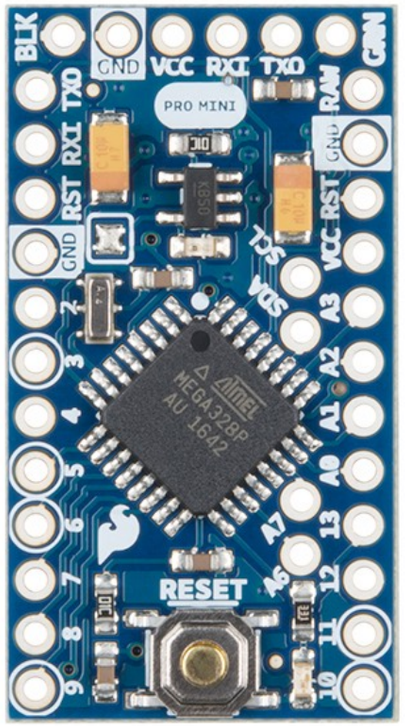
pic

higher level

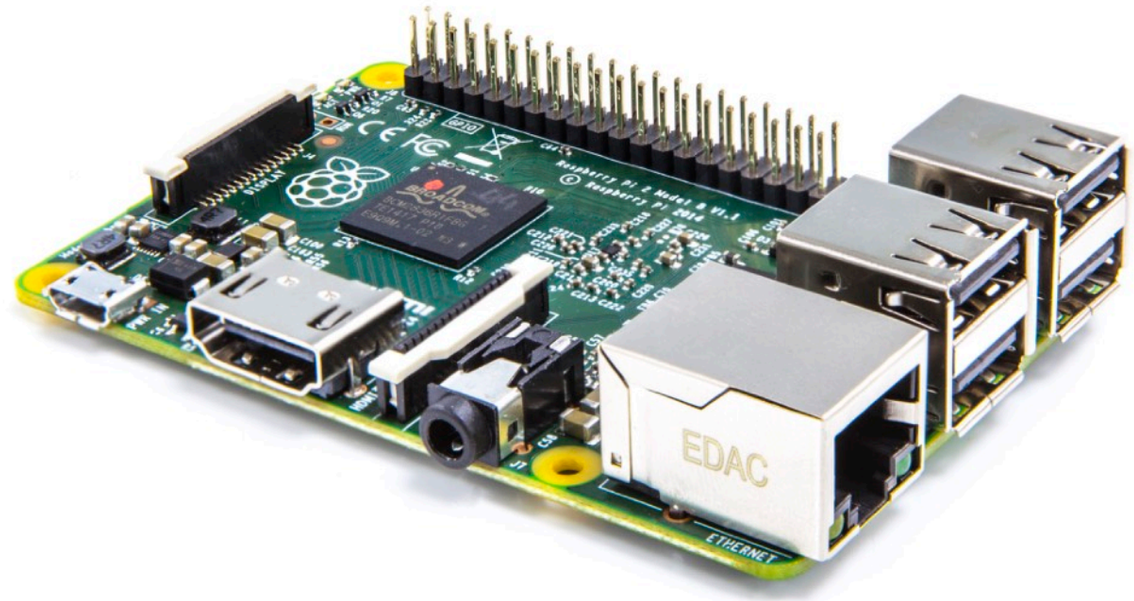
lower level



Assembly



Atmel AT Mega 328

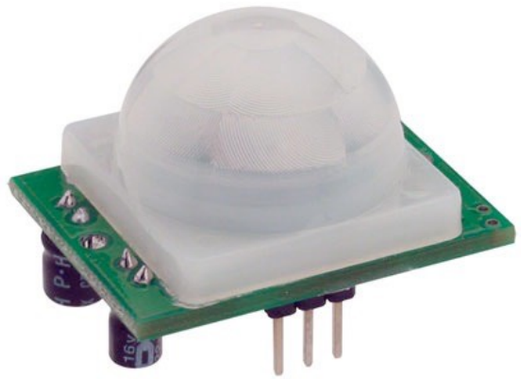


Raspberry PI

http://upload.wikimedia.org/wikipedia/commons/3/3d/RaspberryPi.jpg
http://www.onlymine.de/wp-content/uploads/arduino-nano-board-z.jpg

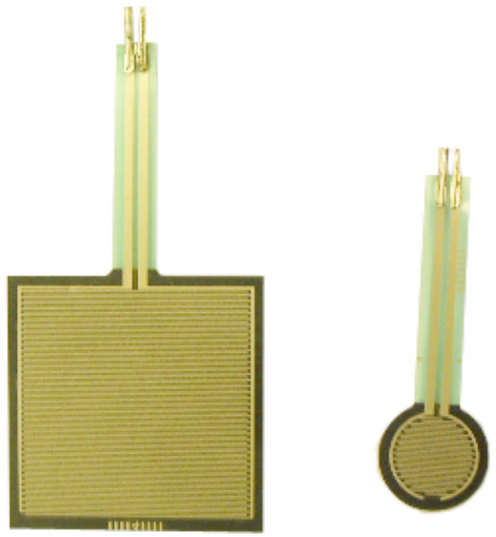
Thermistor

Bend Sensor



PIR Sensor

photo credits © wikimedia



Force Sensor

Potentiometer

Magnet Switch

photo credits © wikimedia

Distance IR Sensor

Touch QT Sensor

Ultrasound Sensor

photo credits © wikimedia

photo credits © alexander wiethoff

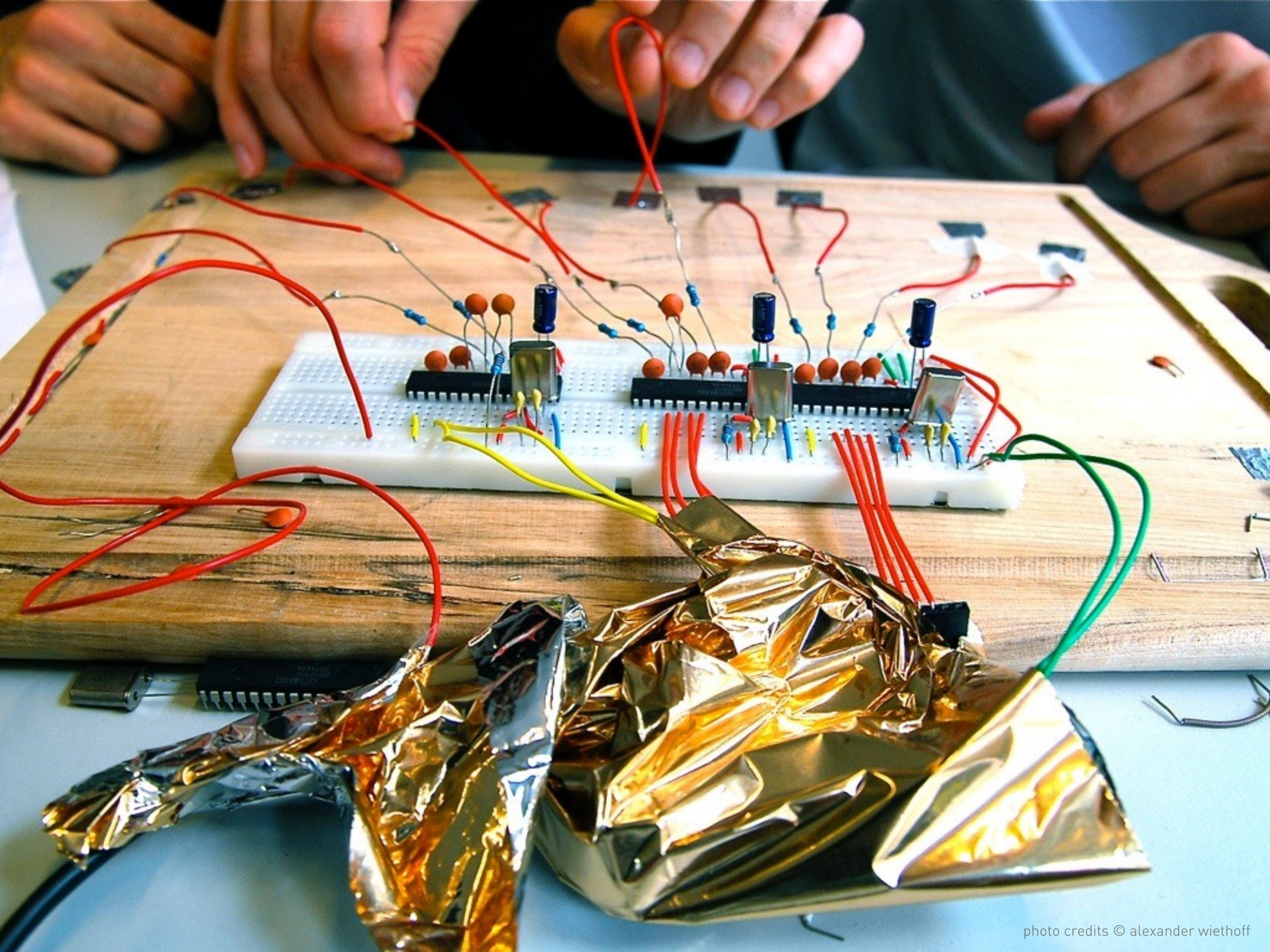


photo credits © alexander wiethoff

Some Examples from a school called

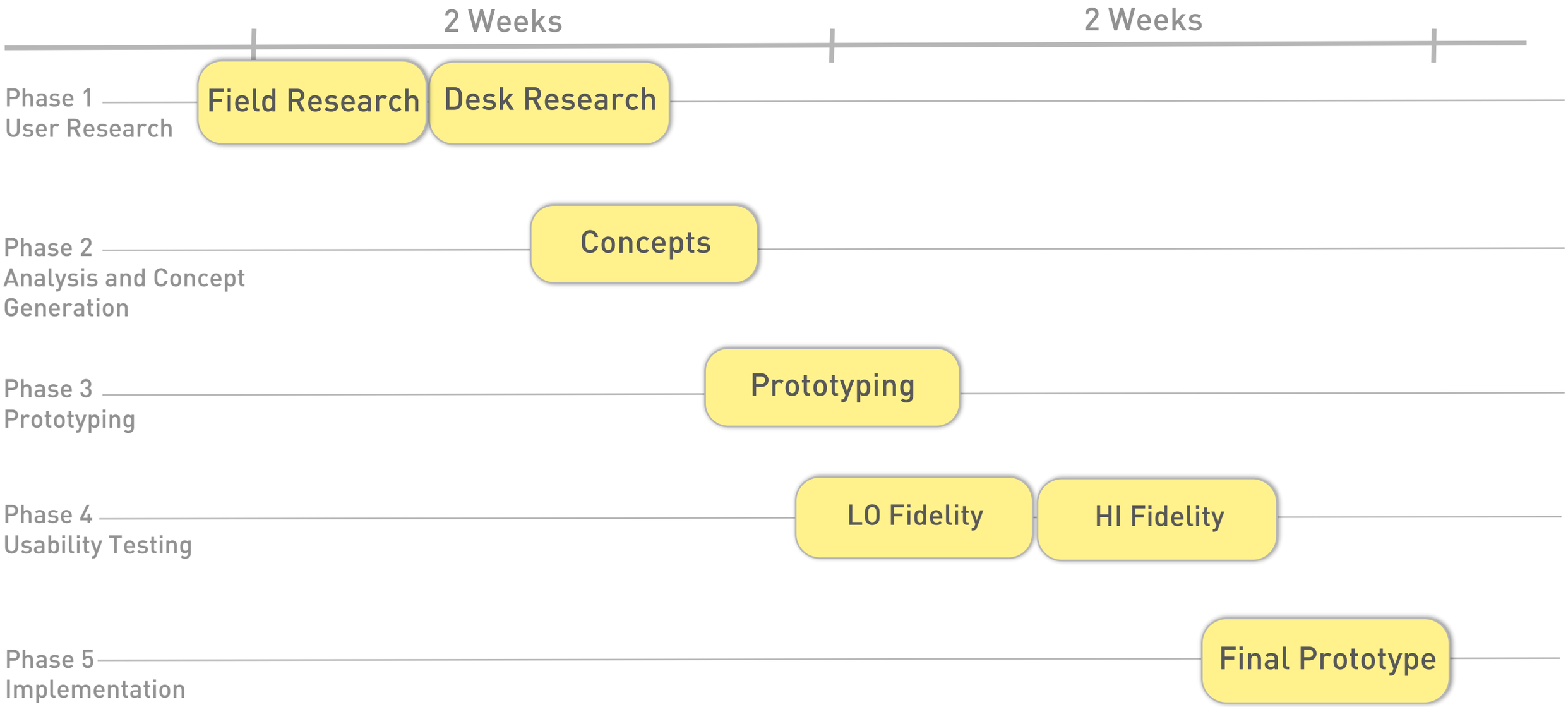
Copenhagen Institute of Interaction Design

(CIID)

Some Examples from a school called

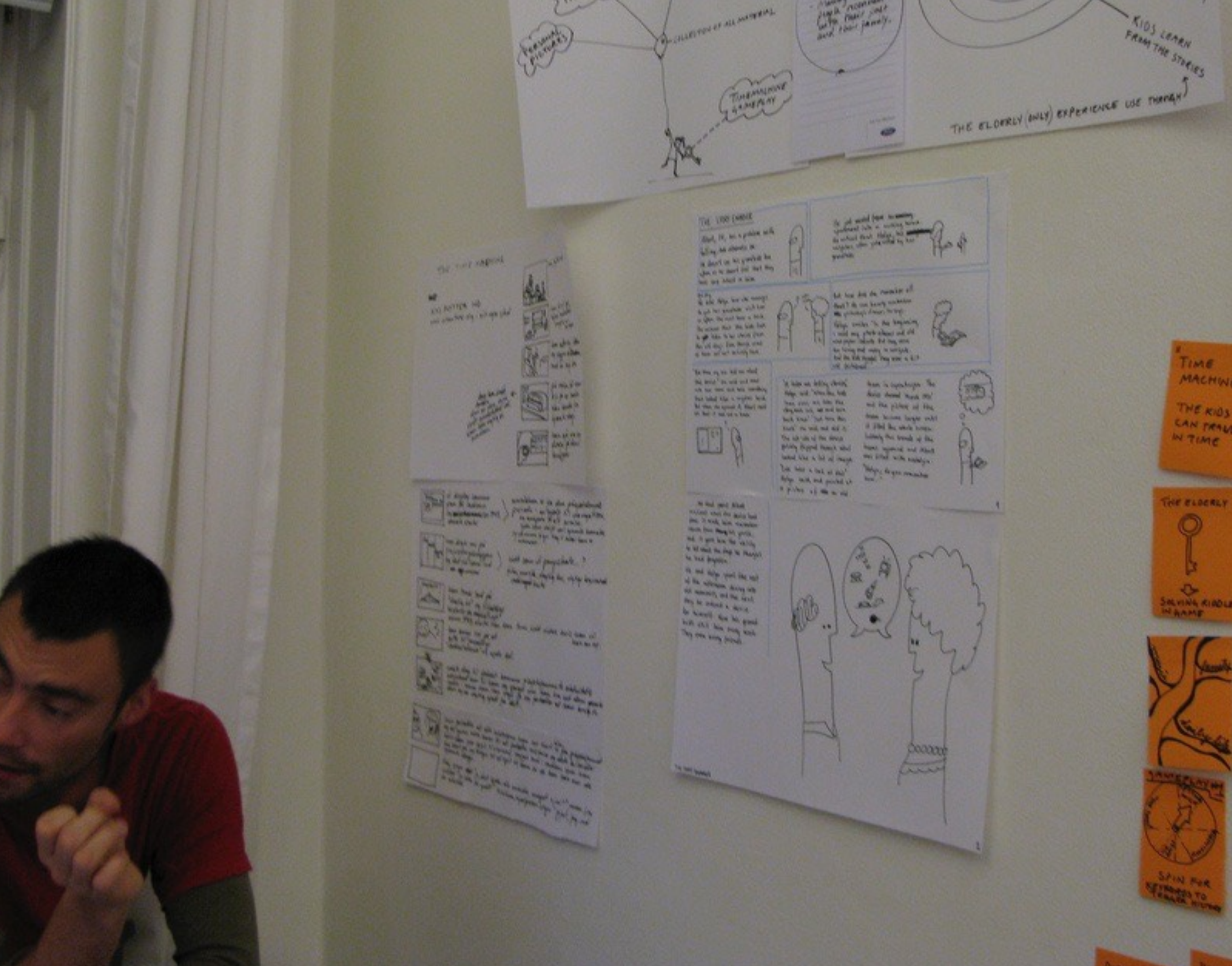
Copenhagen Institute of Interaction Design

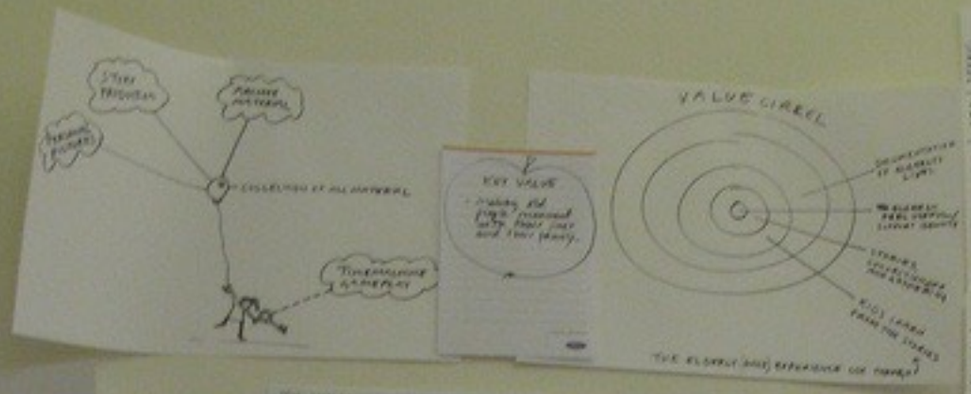
(CIID)

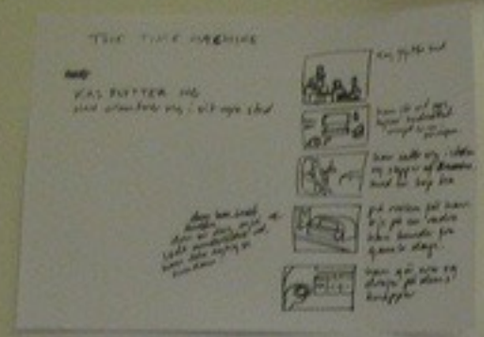

2 Weeks
2 Weeks
Phase 1
User Research
Field Research
Desk Research
Phase 2
Analysis and Concept
Generation
Concepts
Phase 3
Prototyping
Prototyping
Phase 4
Usability Testing
LO Fidelity
HI Fidelity
Phase 5
Implementation
Final Prototype

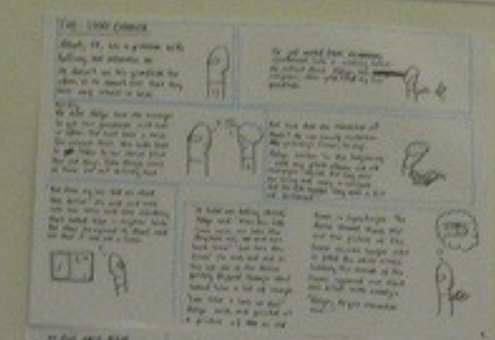
SOCIAL NETWORKING
OTIUM™
SCREEN WALL
E-MAIL - TO - LETTER
SKYPE-TV
FAMILY FRAME + POLAROID
ELDERLY AS RESOURCE
GREEN HOUSE (PET HOUSE?)
TIME MACHINE
STORYTELLING DEVICE
MEMORY-TRIVIA
NANNY
EXCURSIONS
UI
interface
webportal
for the
elderly
TV channels
elderly
focus
OTIUM
PROXY
RFID
STORYTELLER
MEMORIES
SCREEN WALL
changing
walls
SKYPE TV
PICTURE
FRAME
1 OBJECT

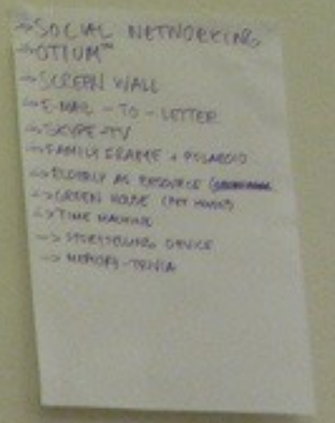
STORIES
MEMORIES
STORIES

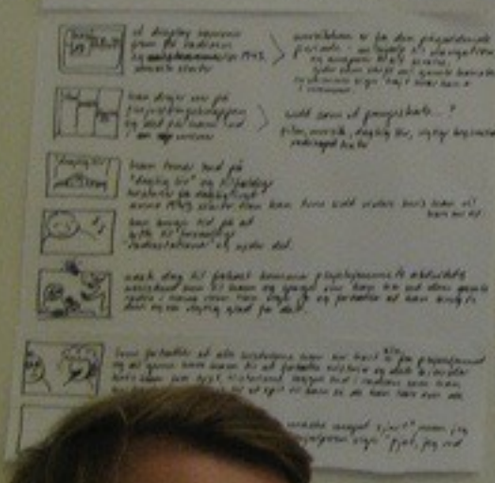

PERSONAL PICTURES
COLLECTION OF ALL MATERIAL
TIMEMACHINE & GAMEPLAY
KIDS LEARN FROM THE STORIES
THE ELDERLY (ONLY) EXPERIENCE USE THROUGH
TIME MACHINE
THE KIDS CAN TRAVEL IN TIME
THE ELDERLY
SOLVING RIDDLE IN GAME
SPIN FOR

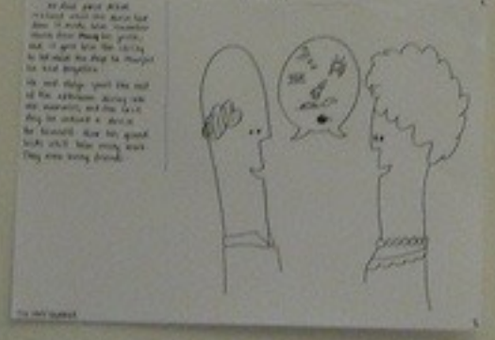

VALUE CIRCEL
KEY VALUE



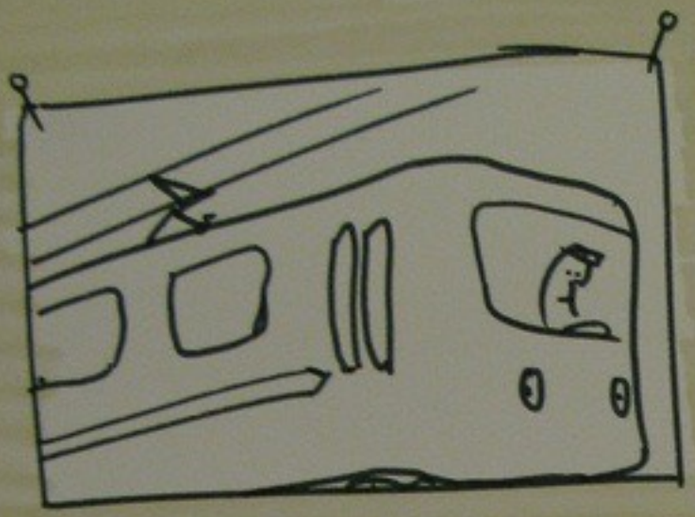


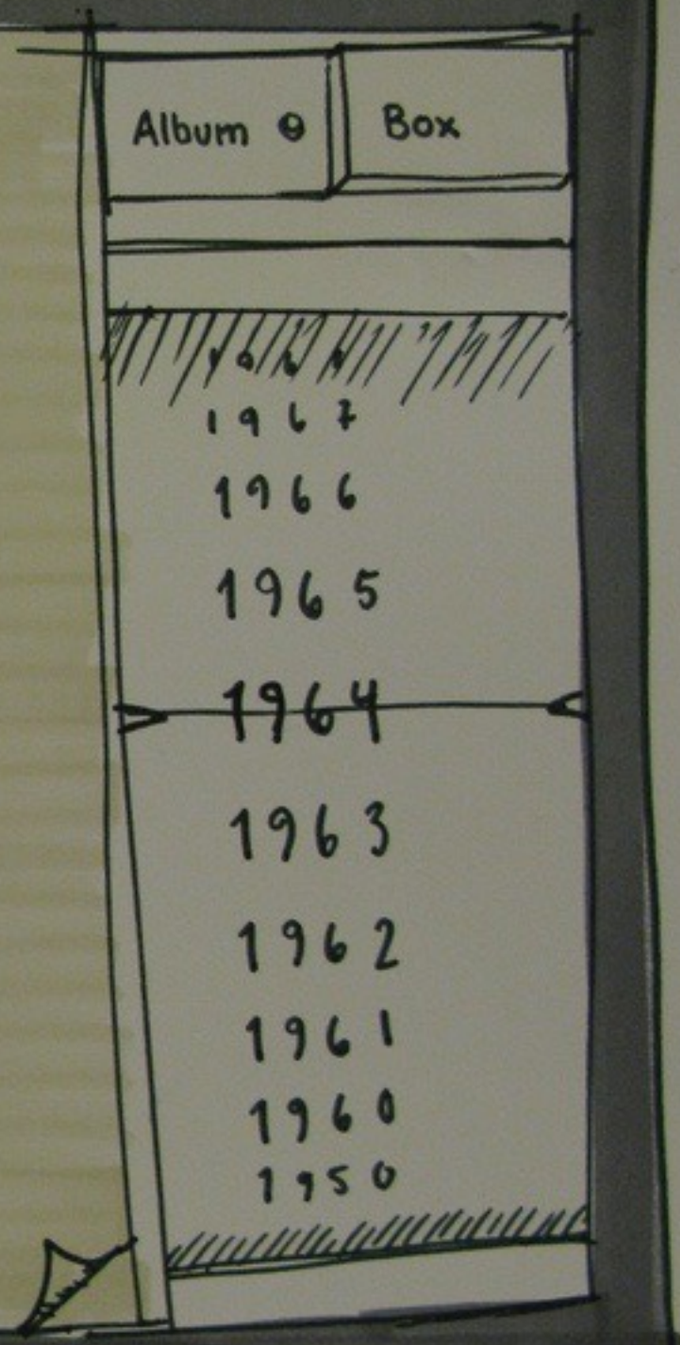

SOCIAL NETWORKING
OTIUM
SCREEN WALL
E-MAIL - TO - LETTER
SKYPE etc
FAMILY FRAME + POLAROID
ELDERLY AS RESOURCE
SCREEN HOME (MY HOME)
TIME MACHINE
STORYTELLING DEVICE
MEMORY TRIVIA



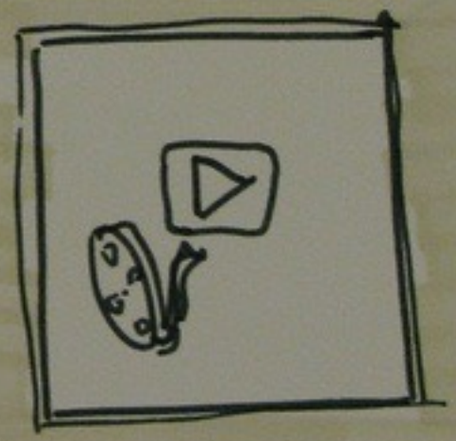


He noticed that his neighbor Helga often get visits from her grandchildren. Apparently they look at old photos, but the album looks a bit strange.
One day he asks Helga what kind of photo-album it is, and why the bids are so interested in it.
Norge '64
The photo is showing Helga's husband on a vacation in Norway" 1964. The photo covers the whole screen, so no other buttons can be pressed. She touches the photo again, and it shrinks to it's original size.
"So you have personal photos in it? But wait, didn't I also see a photo from Politiken in there?" Albert asked.

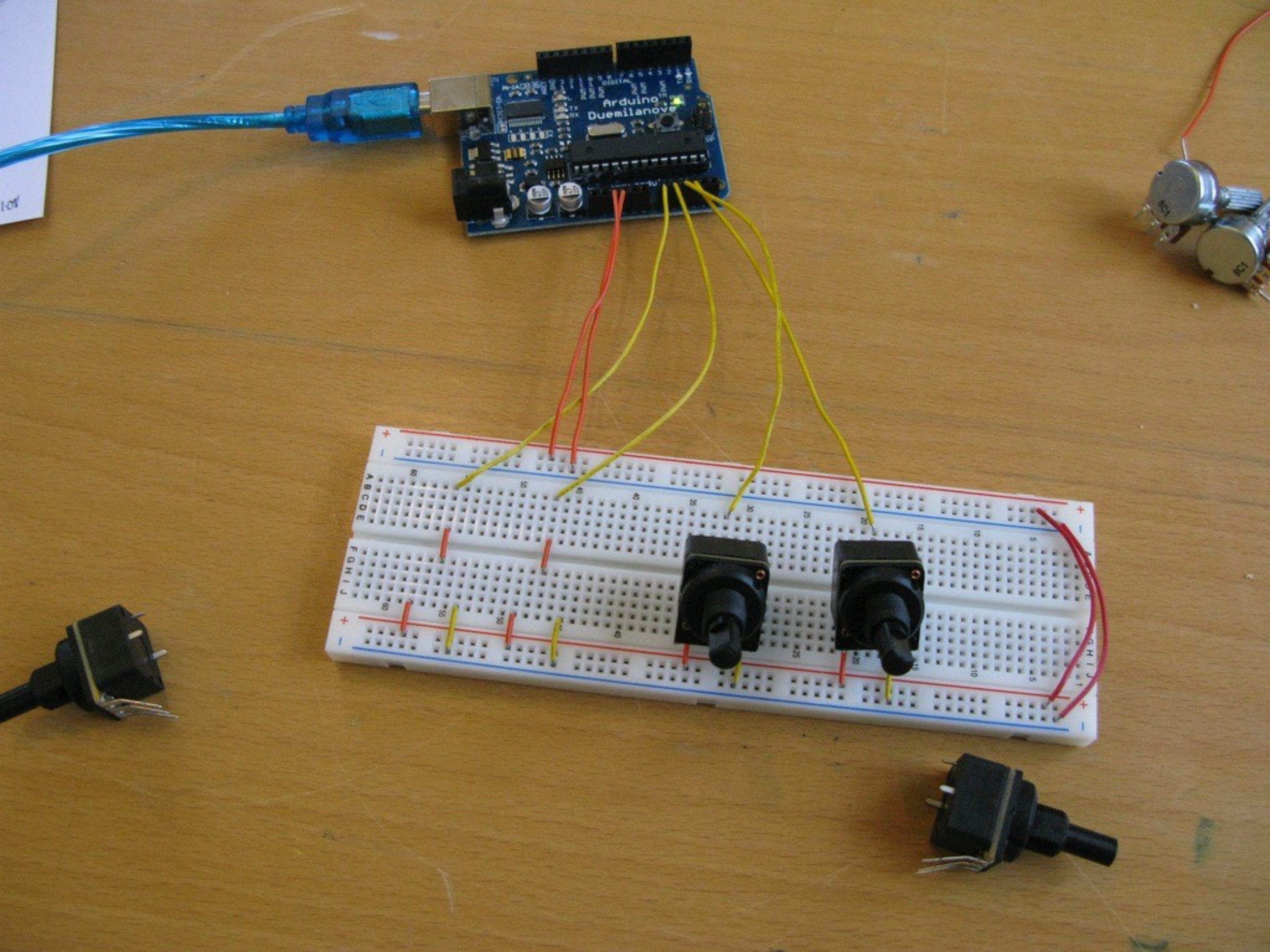




Antoine's new job..



On the ~~left~~ right side of the screen is something that looks like a big wheel. Helga puts her hand on the screen, where the wheel is, and moves it up. The wheel starts rolling and numbers representing years start moving. When the year 1964 is centered, she removes her hand.


Arduino
Duemilanove

Journalist-
foreningens
Viseaften
Viseaften
Journalistforeningen
1968, Music
1965
1970
Favorites

Viseaften

Journalistforeningen

1968, Music

19E

Favorites

OH!
WHAT A LOVELY WAR
What a lovely war
Glenn Gauer
1978, Radio Theater
1975
1980
Favorites

Thanks for your attention !

Tutorials

Physical Computing Intro
https://itp.nyu.edu/physcomp/

Arduino Tutorials
https://www.arduino.cc/en/Tutorial/HomePage

Physical Computing w. Raspberry PI
https://www.raspberrypi.org/learning/physical-computing-with-python/

Adafruit Hacking Tutorials
https://learn.adafruit.com/

Keyboard Hacking Tutorials
http://www.instructables.com/id/Hacking-a-USB-Keyboard/

References (books)

[1] **Bill moggridge: designing interactions**
Publisher: The MIT Press; 1 edition (October 1, 2007)
ISBN-10: 0262134748

[2] **Bill buxton: sketching the user experience**
Publisher: Morgan Kaufmann (March 30, 2007)
ISBN-10: 0123740371

[3] **Don norman: the design of everyday things**
Publisher: Basic Books (September 17, 2002)
ISBN-10: 0465067107

[4] **Kevin mullet: designing visual interfaces**
Publisher: Prentice Hall PTR (December 15, 1994)
ISBN-10: 0133033899

links: www.dkds.ciid.dk
www.medien.ifi.lmu.de
www.arduino.cc
http://www.useit.com/papers/guerrilla_hci.html