Interaction Design

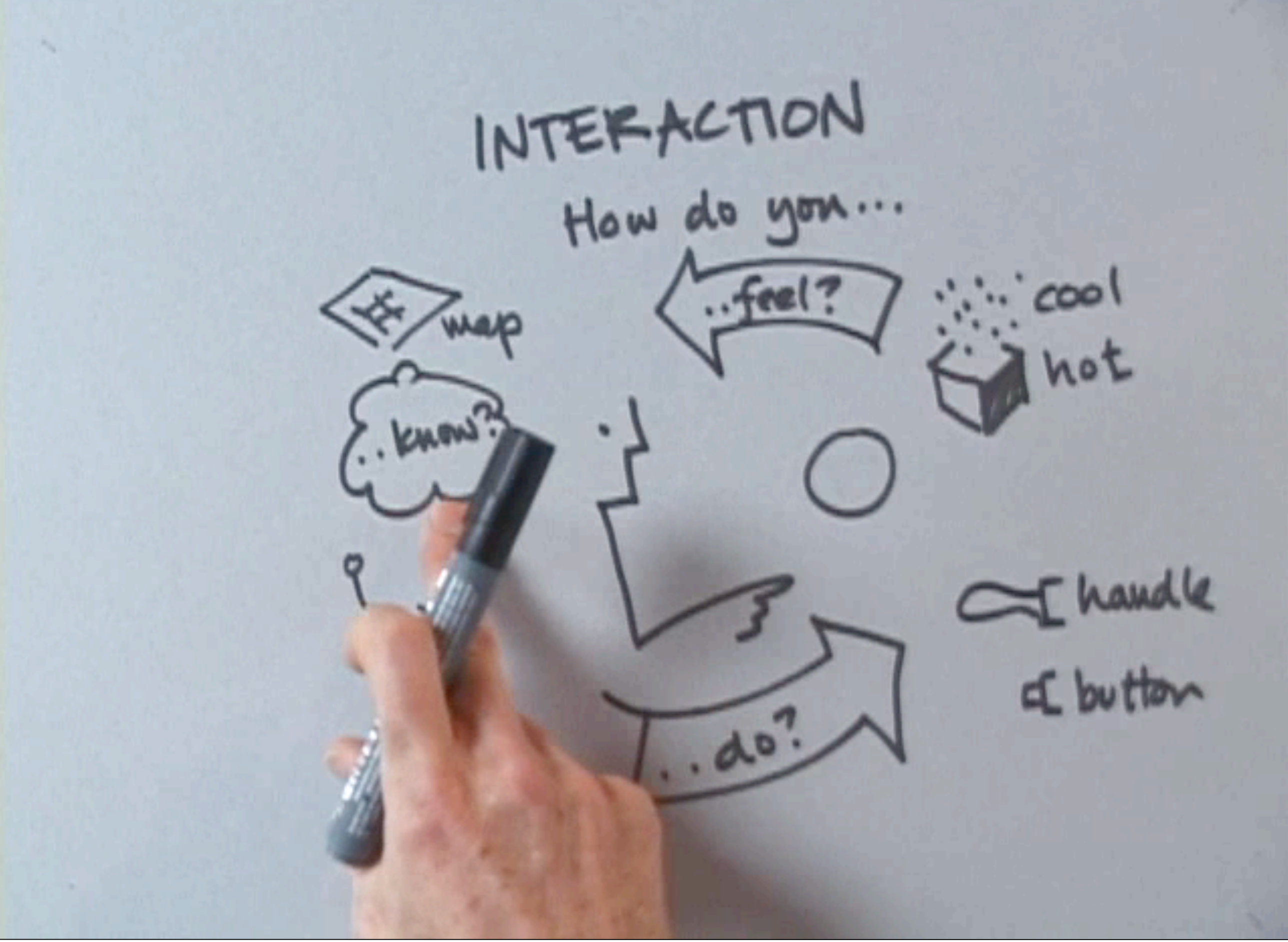
Chapter 4 (May 15, 2013, 9am-12pm): Process Models, Elements and Technology

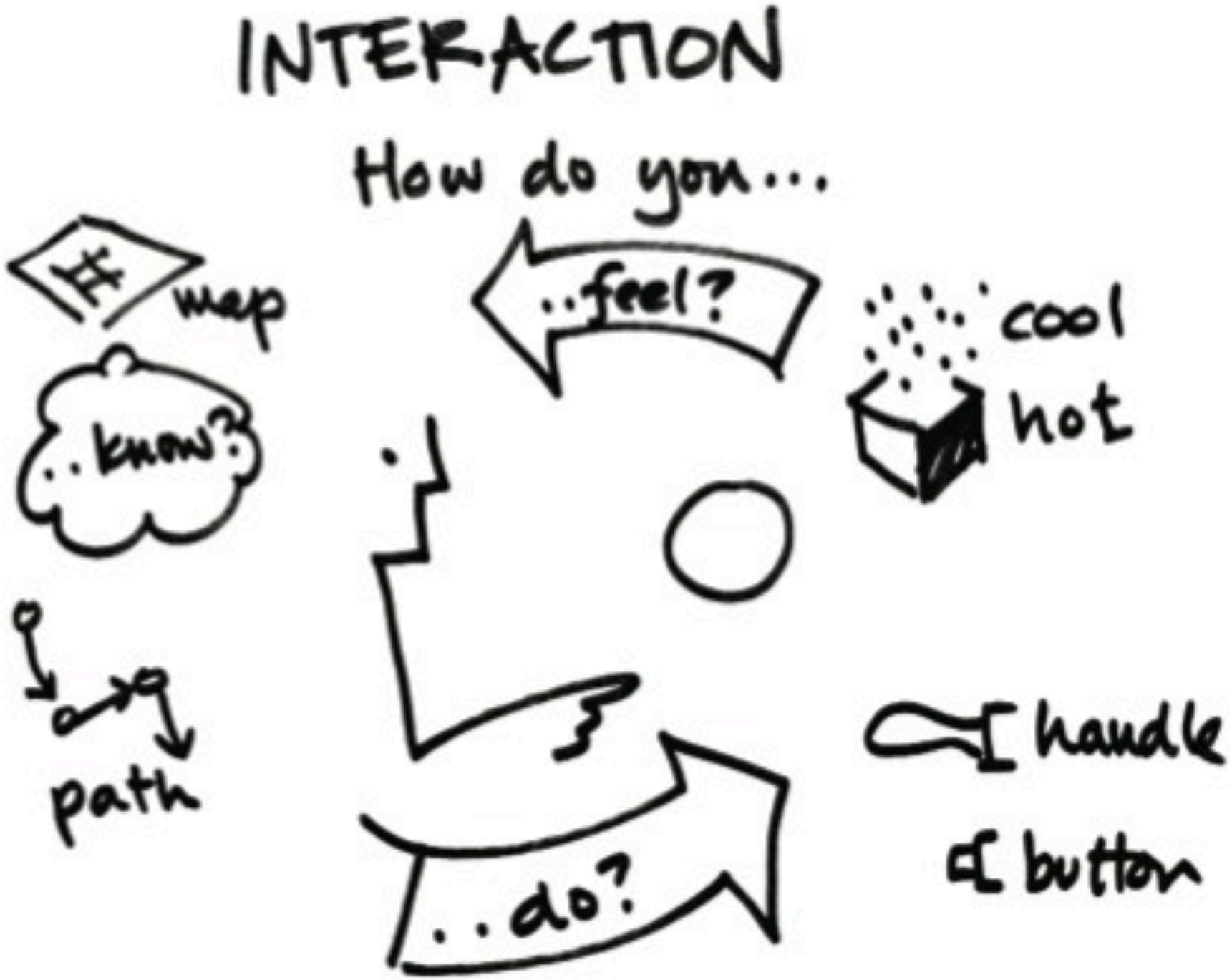
Process Models, Elements and Technology

- Definition and Paradigms of Interaction Design
- Process Models
- Elements of Interaction Design
- Adapting Technology

Bill Verplank

http://rpmedia.ask.com/ts?u=/wikipedia/commons/thumb/9/9b/Billverplank_ciid_2010.jpg/180px-Billverplank_ciid_2010.jpg


INTERACTION
How do you...
..feel?
..know?
..do?
map
cool
hot
handle
button



Bill Verplank
says that the interaction designer has three questions to answer; they are all “How do you . . . ?” questions.

source: [3]

1. “How do you do?”

How do you affect the world?
You can grab hold of a handle and manipulate it, keeping control as you do it.

2. “How do you feel?”

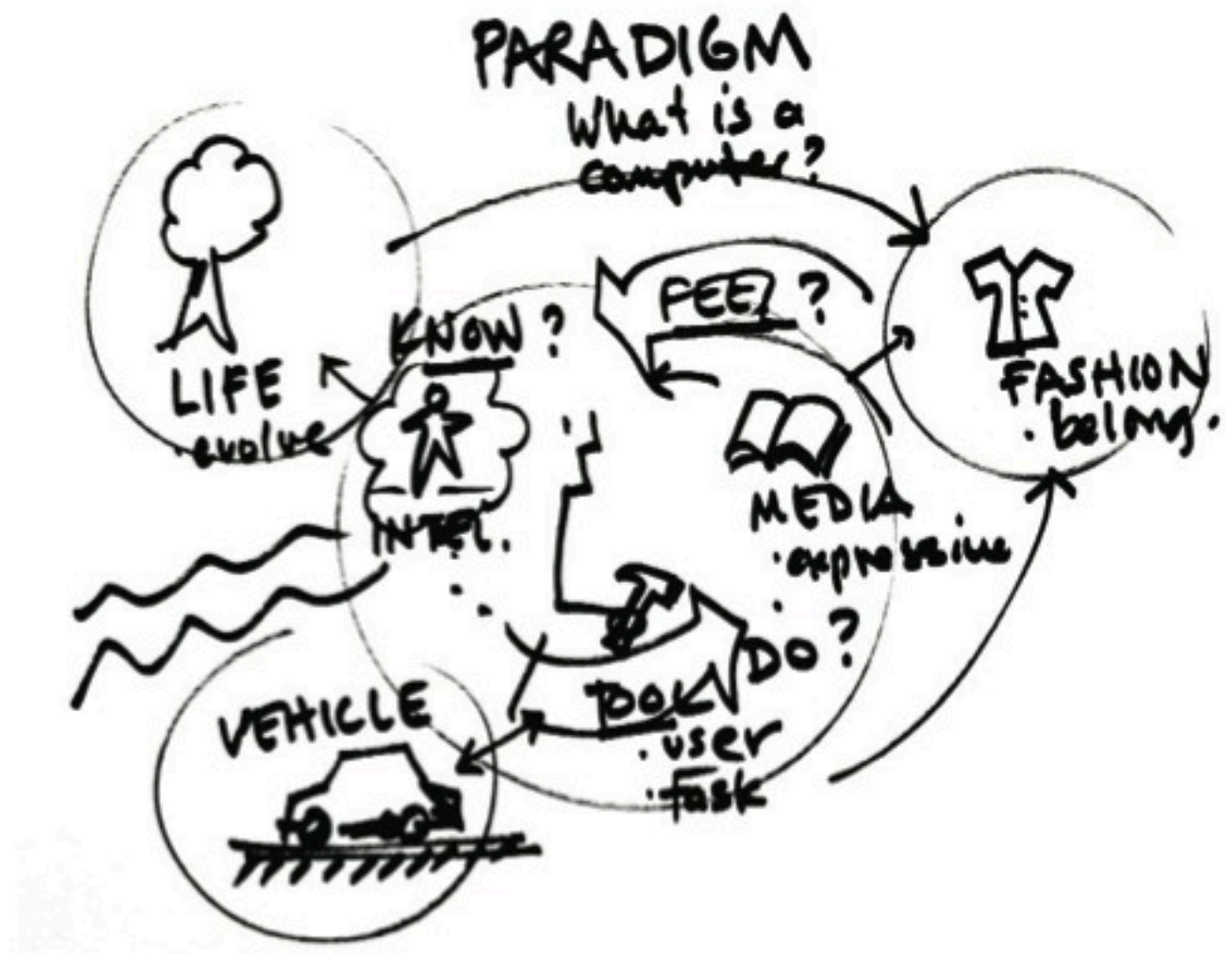
How do you get feedback?
That’s where a lot of feelings come from; a lot of our emotions about the world come from the sensory qualities of those media that we present things with.

3 “How do you know?”

The map shows the user an overview of how everything works, and the path shows them what to do, what they need to know moment by moment

source: [3]

Interaction Design Paradigms



A paradigm is an example that serves as a pattern for the way people think about something.

It is the set of questions that a particular community has decided are important. For interaction design there is often some confusion about what paradigm you are working with.The basic question is,What is a computer?

source: [3]

Intelligence

In the early days, designers thought of computers as people and tried to develop them to become smart, intelligent, and autonomous.

The word “smart” is one that we associate with this paradigm, expecting the machine or product to be smart and to know how to do things for the person who uses it.

http://www.clker.com/clipart-4348.html

source: [3]

Tool

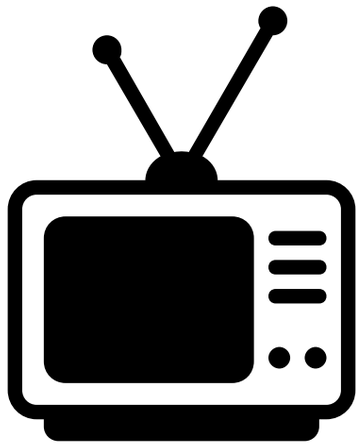
Doug Engelbart, the inventor of the computer mouse, thought of the computer as a tool.

Styles of interaction changed from dialogs, where we talk to a computer and a computer will talk back to us, to direct manipulation, where we grab the tool and use it directly. The ideas of efficiency and empowerment are related to this tool metaphor.

source: [3]

Media

In the nineties, designers thought of computers as media, raising a new set of questions.



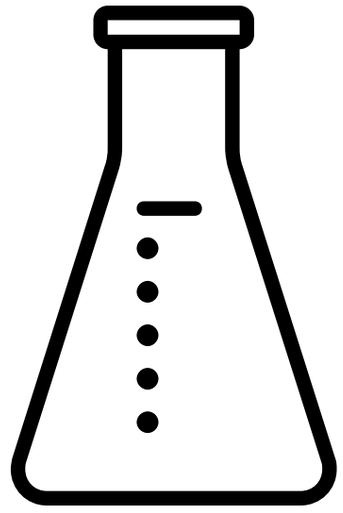
How expressive is the medium? How compelling is the medium? Here we are not thinking so much about a user interacting with or manipulating the computer, but more about them looking at and browsing in the medium.

source: [3]

Life

Starting in the mid nineties, people have been talking about computer viruses or computer evolution; they are thinking of artificial life.

When the program has been written, it is capable of evolving over time—getting better and adapting. The programmer is in a way giving up responsibility, saying that the program is on its own.



source: [3]

Vehicle

Another metaphor is the computer as vehicle, and we have to agree on the rules of the road.

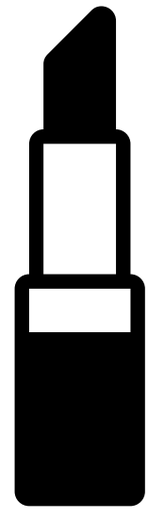
There has to be some kind of infrastructure that underlies all computer systems. People spend their careers determining the standards that will define the infrastructures, and hence the limitations and opportunities for design.

source: [3]

Fashion

The media metaphor plays out to computers as fashion.

A lot of products are fashion products. People want to be seen with the right computer on. They want to belong to the right in-crowd. Aesthetics can dominate in this world of fashion, as people move from one fashion to another, from one style of interaction to another style.



source: [3]

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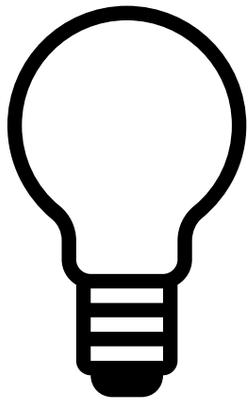
Bill Verplank suggests **a four-step process**.

First, the designers are motivated by an error or inspired by an idea and decide what the ideal goal for the design should be. Next they find a metaphor that connects the motivation to the end goal and develop scenarios to help them create meaning.Then they work out step- by-step what the tasks are and find a conceptual model that ties them all together and clarifies the modes. Finally they decide what kind of display is needed, what the control are, and how to arrange them.

source: [3]

1. Motivation—errors or ideas

Design ought to start from understanding the problems that people are having, and also from ideals.



A lot of people are motivated by problems that they see, breakdowns of one sort or another, errors that they observe. Another place that design starts is with ideas. These are the brilliant concepts, the ideals that we have for making the world wonderful.

source: [3]

2. Meaning—metaphors and scenarios

If you can tell a good story about something, or spin a good metaphor, it makes sense to people.

This is where the meaning of the design comes from. A clear metaphor is the strange idea that connects two things; for example the cloud and the bolt of lightning, saying—Ah hah! This isn't a computer, it's a desktop! Along with the metaphor, we also need a variety of scenarios, to understand the context of Who is using it, Where are they, and What are they trying to accomplish?

source: [3]

3. Modes—models and tasks

In order to create a conceptual model that users will understand, you have to have a clear picture of what they are thinking about.

The mode that they are in depends on what the task is, and what they are trying to accomplish. How they can move from one mode or model to another, or from one environment to another, will then define the tasks. This is the conceptual cognitive science of understanding what the person doing the task needs to know

source: [3]

4. Mappings—displays and controls

Often, as an interaction designer, you design some kind of display and some controls.

The display is the representation of things that you are manipulating. You need to be able to map the controls to the display. Those mappings can be really complicated with computers, as they can remap things in an instant, giving very strange powerful modes that can select everything or delete everything.

source: [3]

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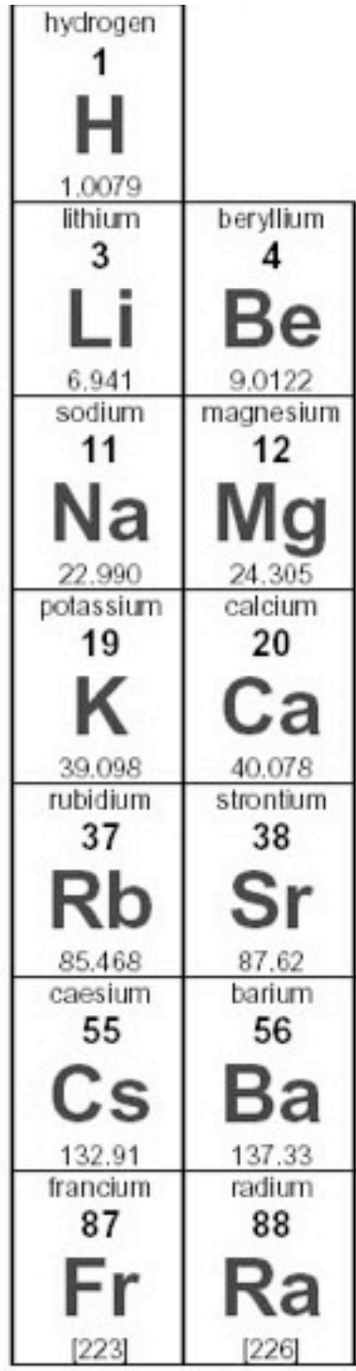
Elements in Interaction Design

Within interaction design, products and services can be purely digital, physical and/or hybrid.

Therefore considerations on the different elements are necessary.



source: [5]

http://www.bpc.edu/mathscience/chemistry/images/periodic_table_of_elements.jpg

Motion, Space,Time, Appearance, Texture and Sound: Cordell Ratzlaff: Developing OSX

source: [5]

Cordell Ratzlaff

-managed the human interface group at Apple for 5 years
-led the design team of OSX
-founded the company GetThere.com
-creative director at Frog Design SF, USA

http://www.designinginteractions.com/interviews/CordellRatzlaff

source: [3]


Home HD
74.52 GB, 1.22 GB free
MOVIE
Fam flicks 78-9.mov
01'08
IOMEGA_HDD
55.86 GB, 445.4 MB free

Looking back...

Motion

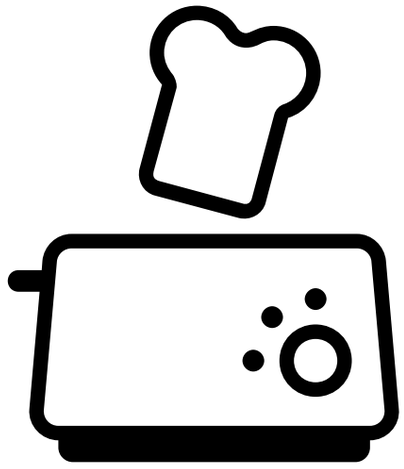
http://www.ipadforums.net/wallpapers/data/500/hand_touch.jpg

Motion

Motion is often a trigger for action.

The triggered action (or at least the feedback for that action) is often about motion as well.

Without motion, there can be no interaction.



source: [5]

Space

http://www.klein-dytham.com/uploads/projects/full/327.jpg

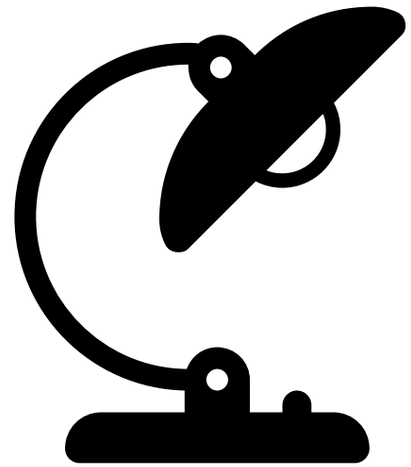
Space

Space provides a context for motion.

Where is the action taking place ?

How are the constraints of the space ?

All interactions take place in a space.



source: [5]

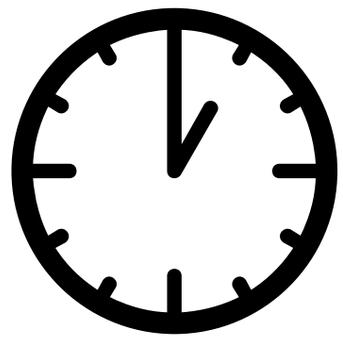
Time

http://www.flickr.com/photos/davespilbrow/3200031698/sizes/o/in/photostream/

Time

Movement through space takes time to accomplish.

Interaction designers need an awareness of time. Some tasks are complicated and take a long time to complete.



Time creates rhythm.

All interactions take place over time.

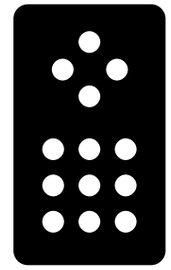
source: [5]

Appearance/Affordances

Appearance

Appearance is the major source (texture is the other) of what cognitive psychologist James Gibson, in 1966, called **affordances**.

Gibson explored the concept more fully in his 1979 book *The Ecological Approach to Visual Perception*, but it wasn't until Don Norman's seminal book *The Psychology of Everyday Things*, in 1988, that the term spread into design.



An **affordance** is a property, or multiple properties, of an object that provides some indication of how to interact with that object or with a feature on that object.

source: [2&5]

Appearance/Affordance has many variables for interaction designers to alter:

1. **proportion**
2. **structure**
3. **size**
4. **shape**
5. **weight**
6. **color (hue, value, saturation)**

All of these characteristics (and more) add up to appearance, and nearly every design has some sort of appearance, even if that appearance is a simple command line.

source: [5]

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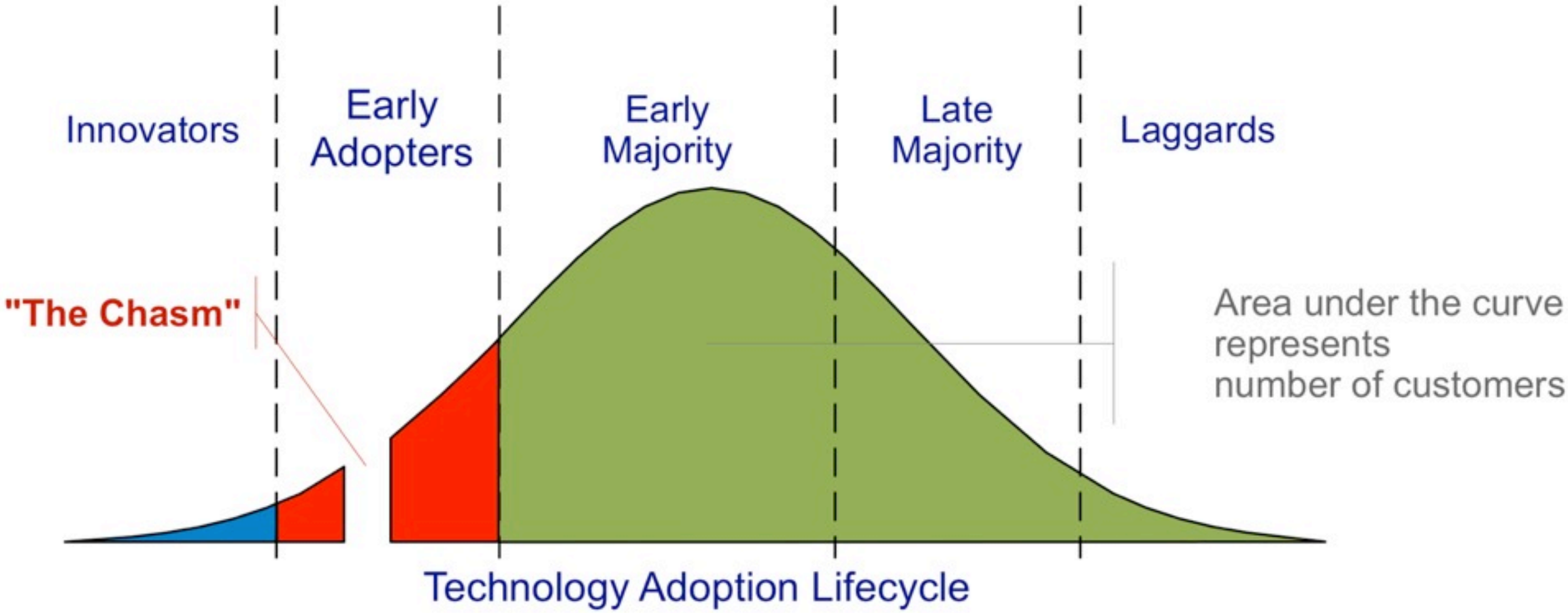


http://www.directimpactnow.com/blog/wp-content/uploads/2010/03/Technology-Adoption-Lifecycle.png


TV
POWER
ON/OFF
VOLUME
VOL
SATELLITE ON/OFF
CHANNELS UP/DOWN
OK
2
3
5
6
8
9
LOCAL CHANNELS START AT 884

source: [3]

We interviewed some people with beautiful and very elaborate new media systems who were quite discouraged and quite unhappy with them.

The solution from the manufacturers of consumer products was to produce the most dumbfounding, enormous remote controls. Thirty buttons was not a large number for those controls. There was a period of suppression of the adoption of the best of this technology simply because it was too complicated to use.

David Liddle, 2003

source: [3]

Three Phases of Product Adaption

source: [3]

David Liddle

-worked at PARC
-was one of the lead designers creating the STAR workstation
-founded a company named *Metaphor Computers*
-set up a research laboratory, *Interval Research*, focused on interdisciplinary interaction design

source: [3]

http://www.designinginteractions.com/interviews/JeffHawkins


Nikon
Auto 1:3.5 f=20mm
Nippon Kogaku Japan
No.435989
NIKKOR-UD

Looking back...

-different phases of adoption have different impacts on their usability

-controls become automated in the final (consumer) phase


Hobby
ENTHUSIAST PHASE
"Exploit me!"
Work
PROFESSIONAL PHASE
"Help me work!"
Life
CONSUMER PHASE
"Enjoy me!"

source: [3]

Enthusiast

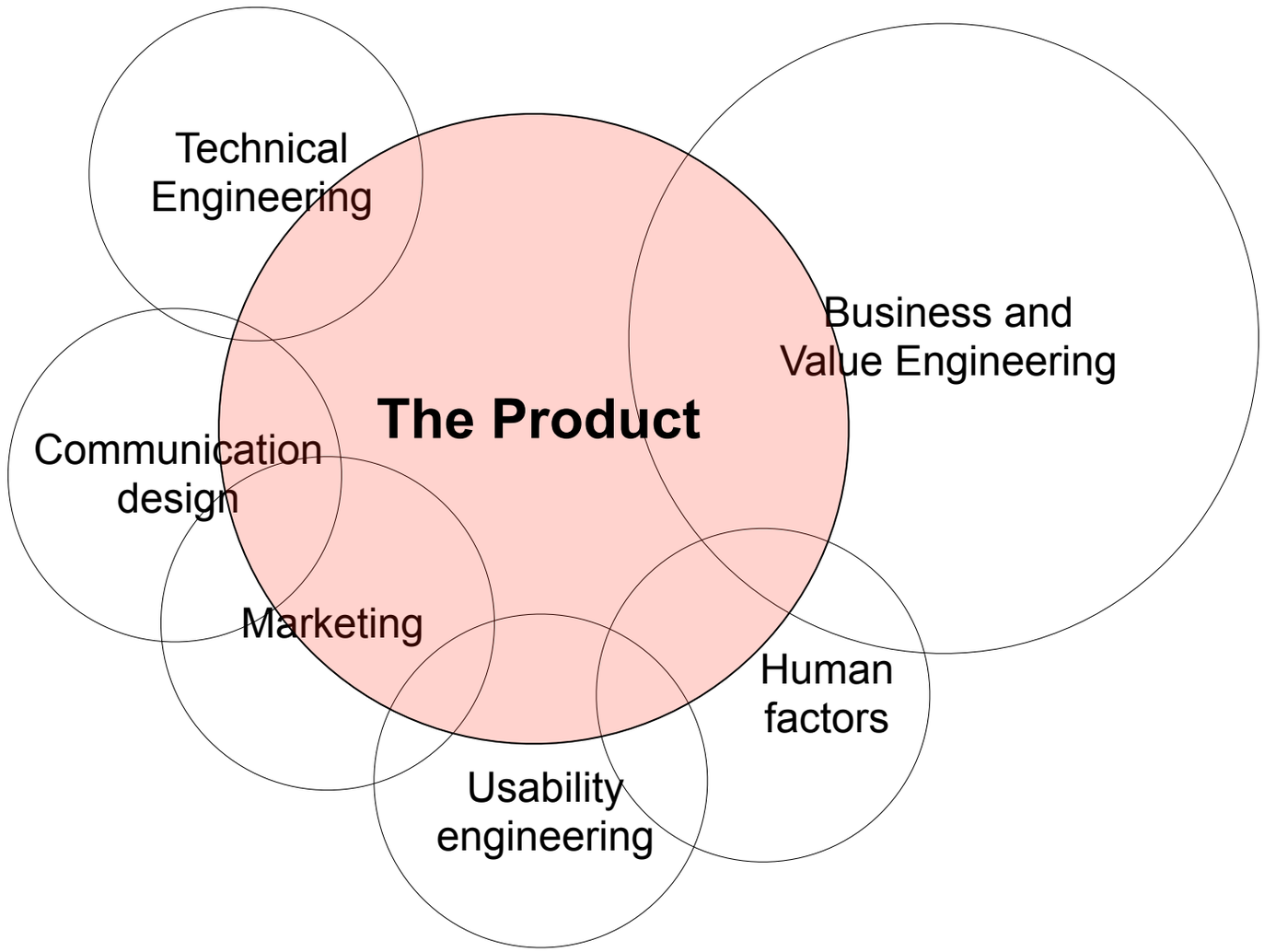
Inventors are often good at coming up with the first version of a technology and can find the “enthusiasts” to adopt the technology by creating nothing more than an innovative solution.

The inventor, even when supported by a band of technicians, cannot develop the technology once it enters the “professional” phase.

Usability at this stage is perceived of **low value**.

source: [3]

Professional



New design values apply when people adopt the technology for practical purposes. Now the design must be **reliable**, it must **perform consistently**, it must be **priced** to offer reasonable value, and above all it must be both **useful** and **usable.**

source: [3]

Professional

A design for the professional phase does not need necessarily to be **easy to use,** as people take pride in acquiring skill in their work; their learned skill separates them from the unskilled and allows them to feel expert.

The design does not have to be enjoyable, as people tend to take their work seriously and are willing to try hard to be productive, even if the experience is unpleasant.

Usability at this stage is perceived of **mid value**.

source: [3]

Nikon F2AS

http://www.nikon-fotografie.de/vbulletin/picture.php?albumid=9638&pictureid=198156

Consumer

Usability is of very **high value** at this stage an can result as a crucial advantage in competition.

Designs at this level should be : Enjoyable, robust and easy to use.

VCR Recorder in the 80s’

- Record TV shows when you're away and play them later – 14-day, 4-event timer.
- Record 2-4-6 hours, or up to 8 hours on an extended-play cassette.
- Record instantly without programming with One Touch Recording – select ½-hr. increments up to 4 hrs., with automatic shutoff.
- Show a host of all-time favorite movies now available on cassettes (not included).
- Replay scenes you've missed or want to see again.
- Watch one TV channel while recording another.
- Enjoy special effects – pause/still frame, frame advance, variable-speed slow-motion, and new Double Speed (X2) Play for improved visual search.
- See a better picture during special effects – advantage of the 4-head design.
- Pre-set up to 99 memory positions with voltage synthesized tuning.
- 107-channel capacity, cable capable
- Operate many functions by wireless remote control.
- Install it yourself – illustrated instructions included.

Take advantage of this big $180.00* Saving while you can

Pay as little as $17.50 per month as a Major Purchase Charge.

Only $469.95

plus transportation and handling, and any applicable sales tax

*Offered at $649.95 in the big JCPenney Spring '86 Catalog

110-120V, AC. UL listed. 17 in. wide x 11¾ in. deep x 4 in. high. Made in Japan

A manufacturer's warranty is available. For a copy, write to: J.C.Penney Company, Inc., Warranty Division, Product Service Department, 1301 Avenue of the Americas, New York, NY 10019.

• Please enclose remittance part with the address showing through the window.

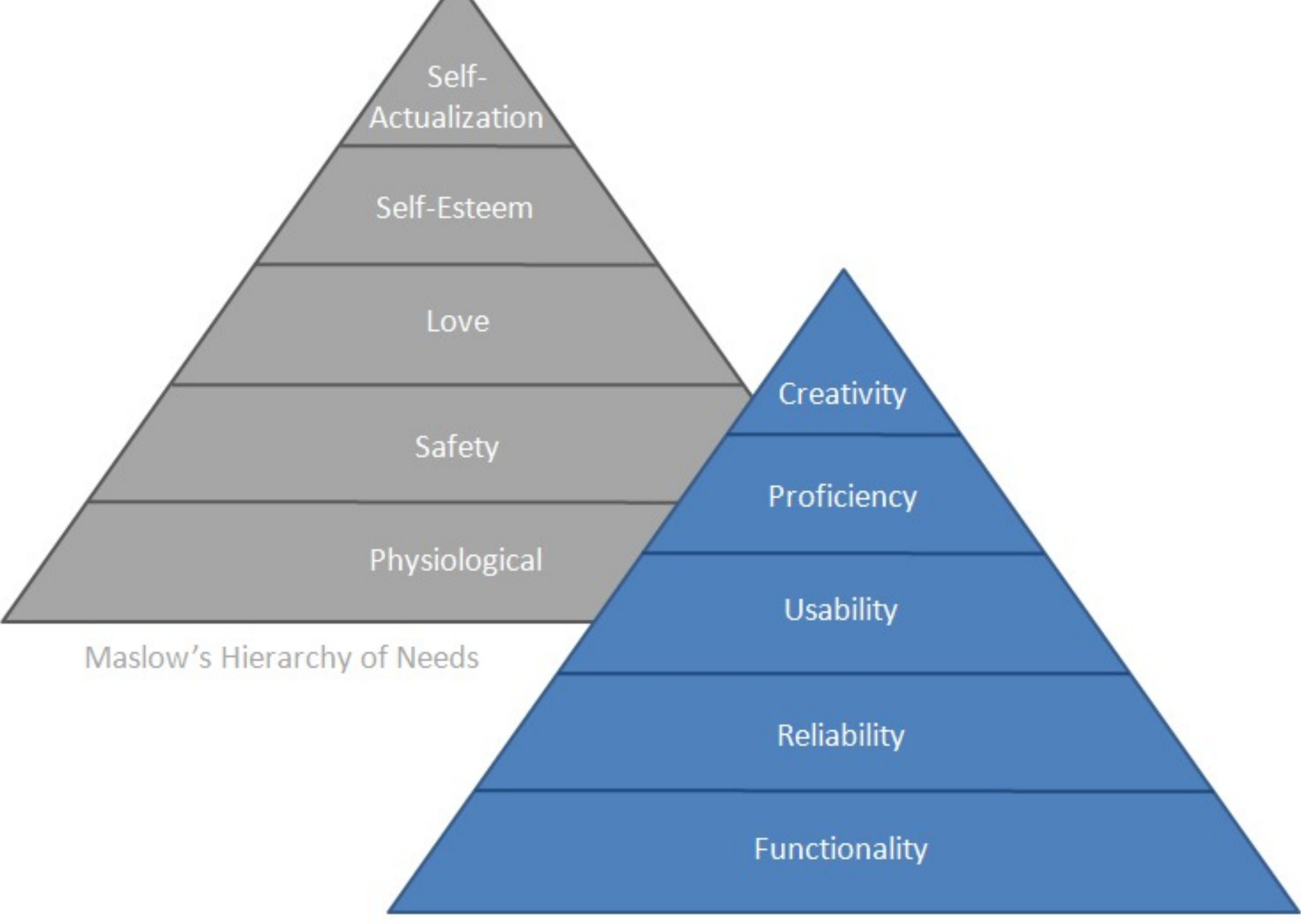
• Use this envelope for payment of your account.

http://www.flickr.com/photos/tigerzombie/4657515713/

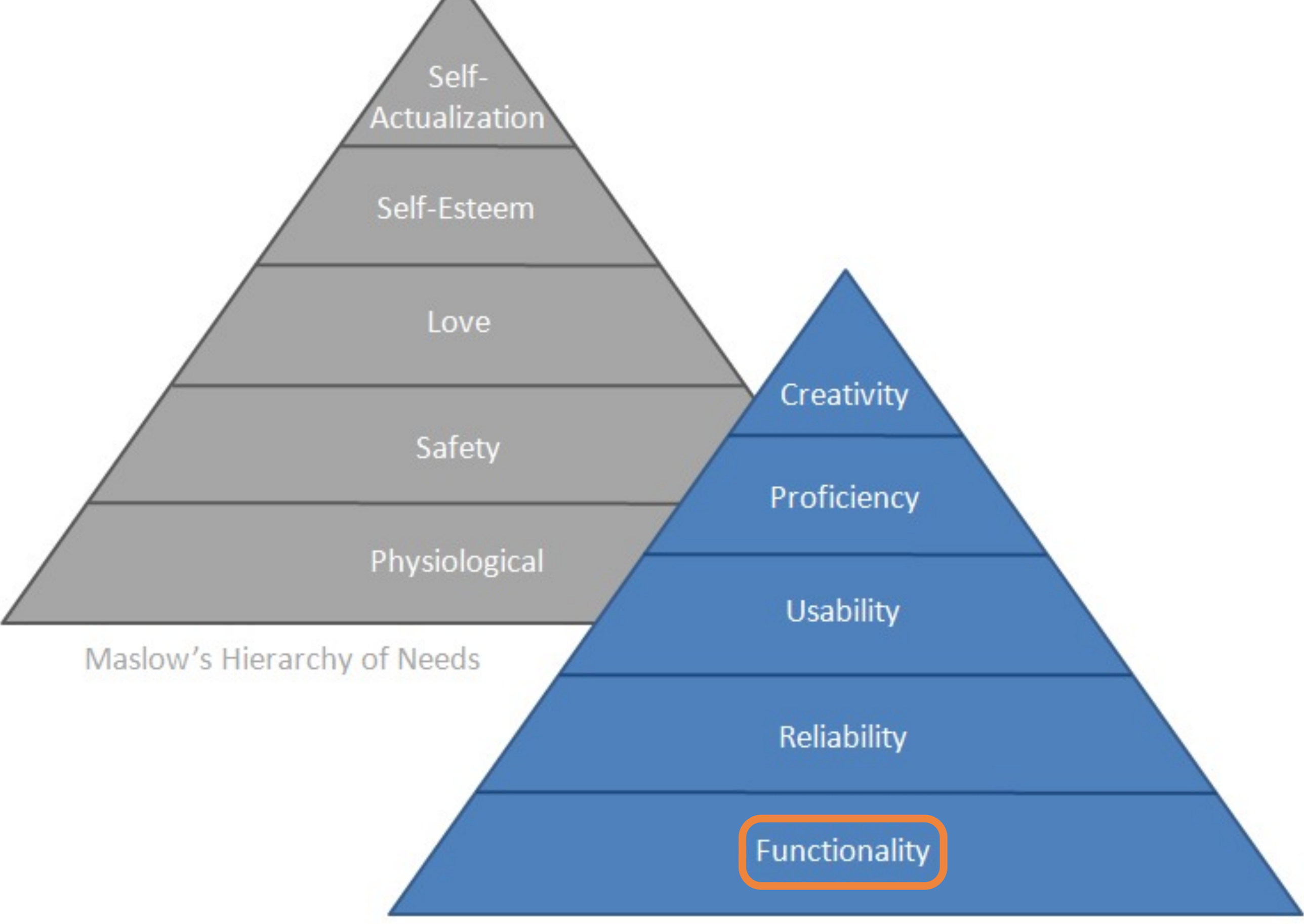
BMW iDrive

http://www.usautoparts.net/bmw/pics/5er/10352_1024.jpg

Hierarchie der **Design Bedüfnisse** (Lidwell: Universal Principles of Design, 2003)


Self-Actualization
Self-Esteem
Love
Safety
Physiological
Maslow's Hierarchy of Needs
Creativity
Proficiency
Usability
Reliability
Functionality
Design Hierarchy of Needs

source: [7]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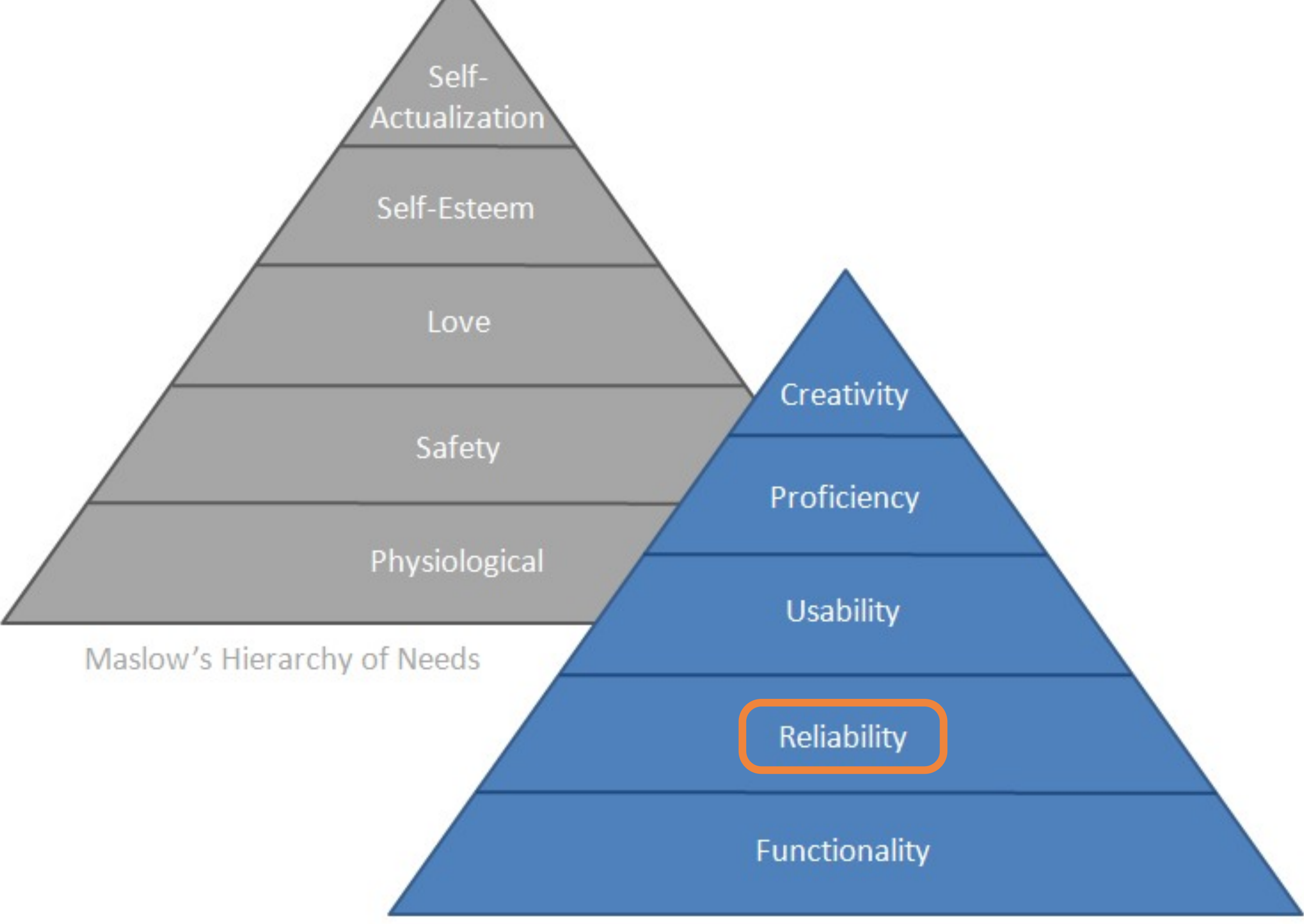
Design Hierarchy of Needs

source: [7]

Functionality needs have to do with meeting the most basic design requirements.

For example a DVD recorder must, at minimum, provide the capability to record play, and review recorded programs. Designs at this level are perceived to be of little or no value.

source: [7]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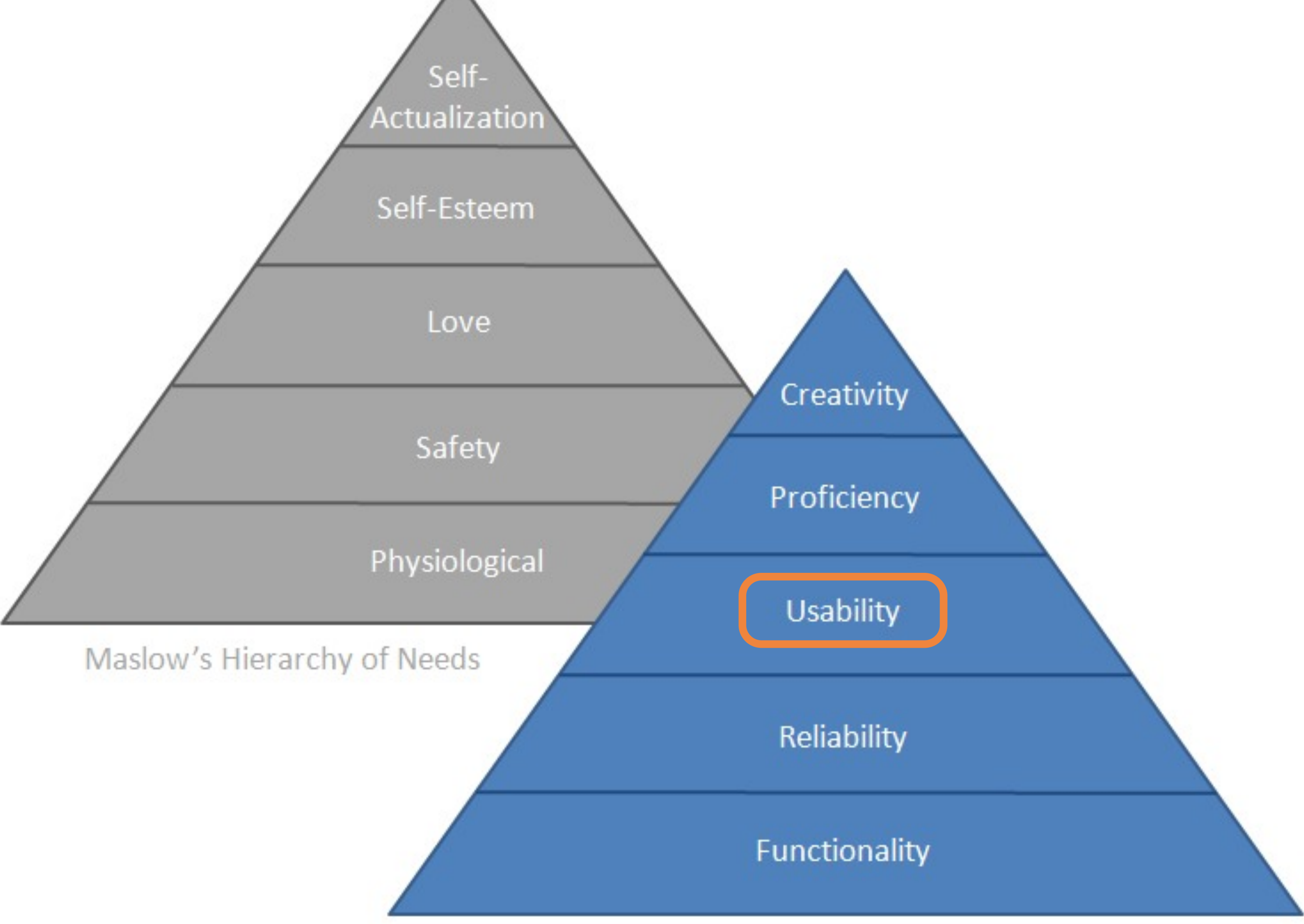
source: [7]

Reliability needs have to do with establishing stable and consistent performance.

For example a DVD recorder should perform consistently and play back recorded programs at an acceptable level of quality. If the design performs erratically, or is subject to frequent failure, reliability needs are not satisfied. Designs at this level are perceived to be of low value.

source: [7]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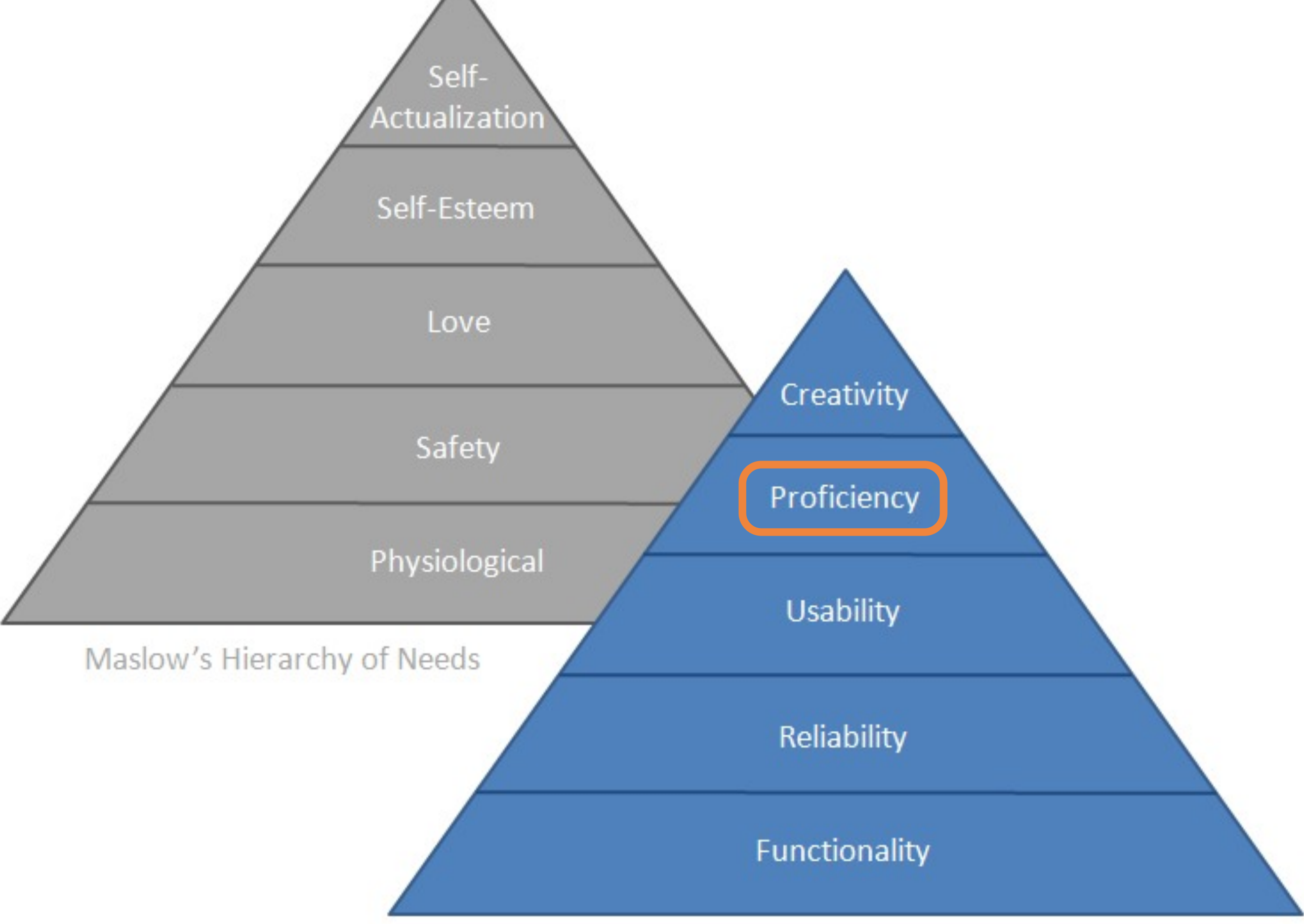
source: [7]

Usability needs have to do with how easy and forgiving a design is to use.

For example, configuring a DVD recorder to record programs at a later time should be easily accomplished, and the recorder should be tolerant of mistakes. If the difficulty is too great, or the consequences of simple errors too severe, usability needs are not satisfied. Designs at this level are perceived of moderate value.

source: [7]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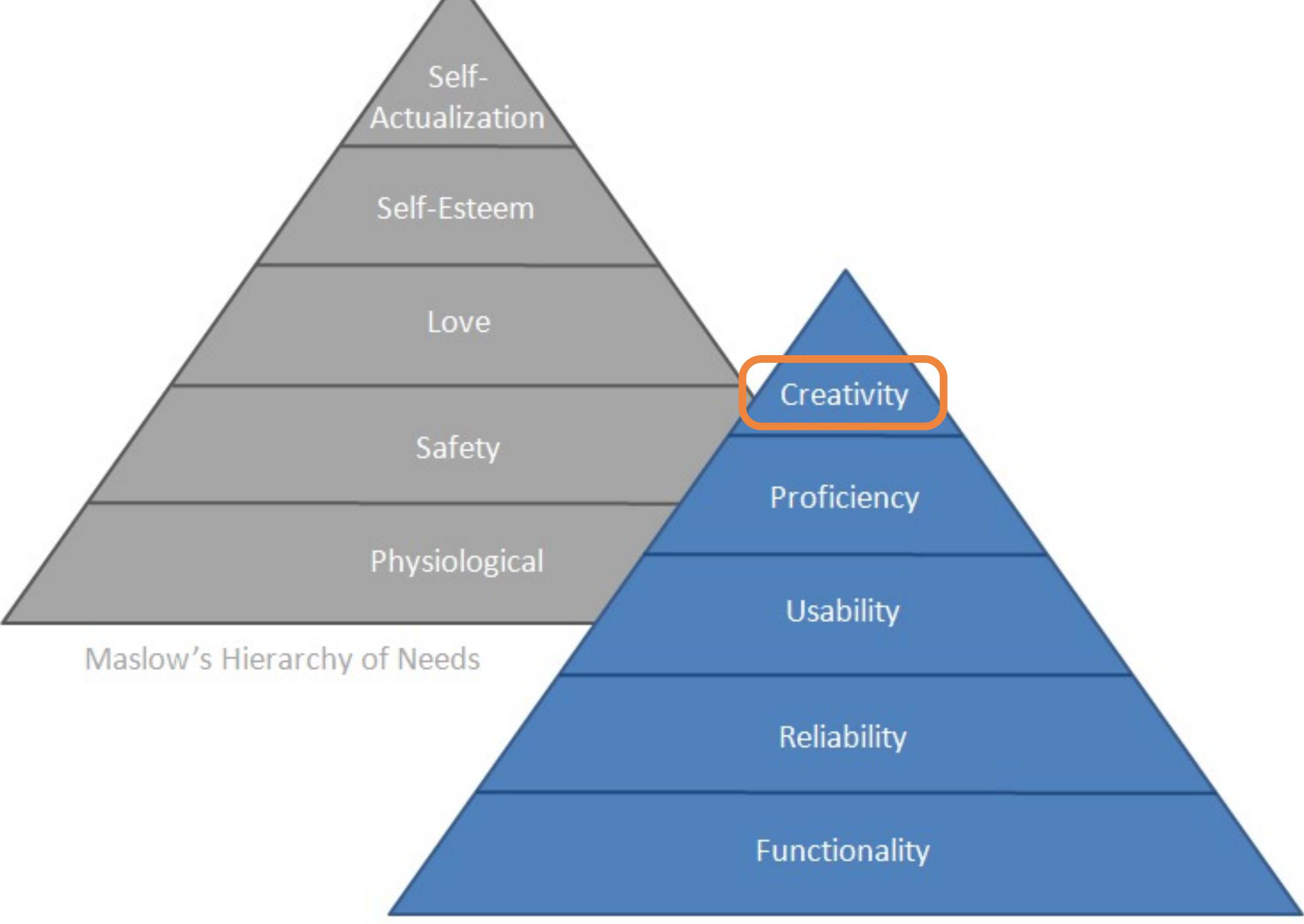
source: [7]

Proficiency needs have to do with empowering people to do things better than they could previously.

For example, a DVD recorder that can seek out and record programs based on keywords is a significant advance in recording capability, enabling people to do things not previously possible. Designs at this level are perceived to be of high value.

source: [7]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source: [7]

Creativity is the level in the hierarchy where all needs have been satisfied and people begin interacting with the design in innovative ways. The design, having satisfied all other needs, is now used to create and explore areas that extend both the design and the person using the design.

Design at this level is perceived to be of the highest value, and often achieve cult-like loyalty among users.

source: [7]

Mat Hunter

-received an MA in interaction design from the RCA
-joined IDEO in 1995
-was key to develop an interaction architecture for kodak
-head of interaction design at IDEO London

http://www.designinginteractions.com/interviews/MatHunter

source: [3]

Looking back...

-conventional technology being replaced by electronics

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-increased product functionality (capture and review)

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-user insights lead to concepts (scenarios)

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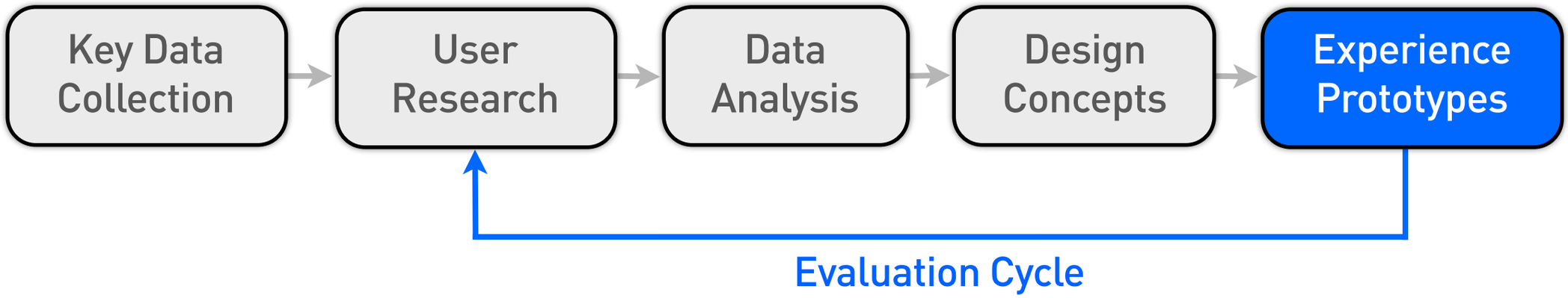
Looking back...

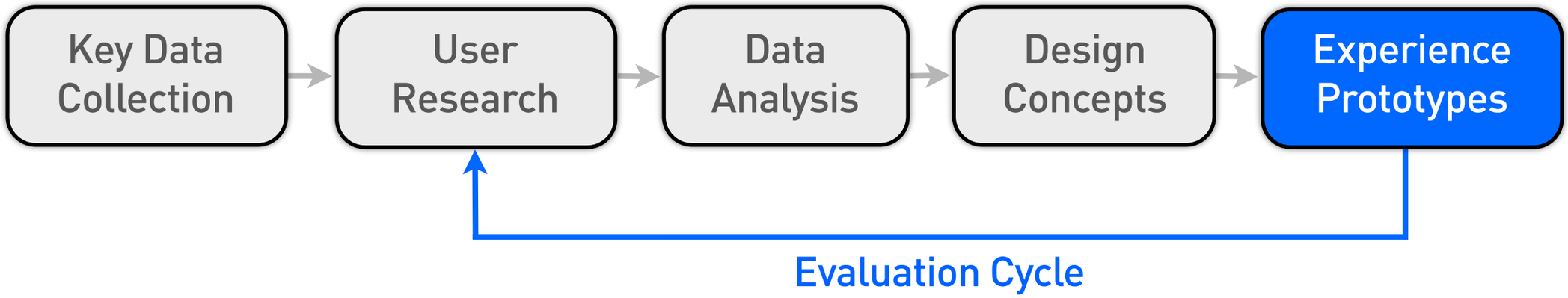
-conventional technology being replaced by electronics
-increased product functionality (capture and review)
-user insights lead to concepts (scenarios)
-considering taking photos and storing them as a social activity
-building an experience prototype to emulate the “look & feel” of an interaction and to communicate the idea further

Strategic (IxD) Concept Generation:

From User Insights to Experience Prototype



Research and Analysis



1. Readiness to capture

Insight:
The professional photographer travels with cases full of lenses, camera bodies, tripods, and lighting equipment.

Analysis:
The team predicted that when digital photography is adopted by the general public, cameras will include a broad range of devices, from the traditional professional kit at the top end, through simple cameras with built- in lenses, to devices such as cell phones, or wearable cameras that would look like jewelry.

2. Information at capture

Insight:
The real-time feedback of the screen on the back of the camera would emerge as a highly valued feature of the digital camera, so you could see immediately if the shot looked promising or disappointing.

Analysis:
Information about when a picture was taken could also be recorded, along with the technical details of the image, and perhaps a voice annotation.

3. Creative control

Insight:
In traditional photography, the composition of the shot and the choice of lighting happens in the camera, but there is another set of opportunities for creative control that happens later in processing and printing.

Analysis:
The team realized that digital photography is not so sequential. Any time during the process, you can apply filters, pixilate, choose sepia, add picture frames, text, and so on.

4. Organization

Insight:
There are well-organized albums of photographs that people use to remember an event or a trip, or to recount the story to their friends, but there are also countless boxes full of unsorted photographs in almost every home.

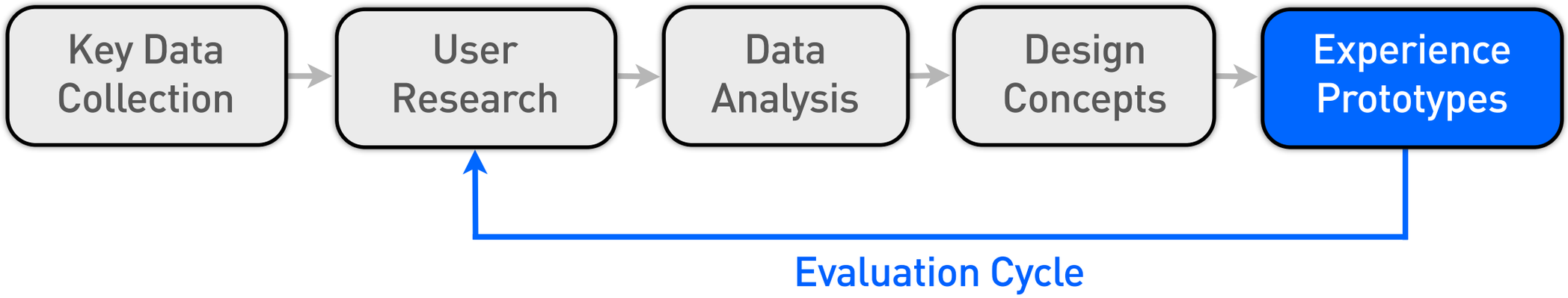
Analysis:
Digital photography offers the opportunity to sort using the “information at capture,” but also to recognize images from small thumbnails. iPhoto from Apple has made excellent use of our ability to scan tiny versions of images to recognize the one we are looking for, leveraging the fact that we remember images best by a visual representation rather than by which shoe box we put it in.

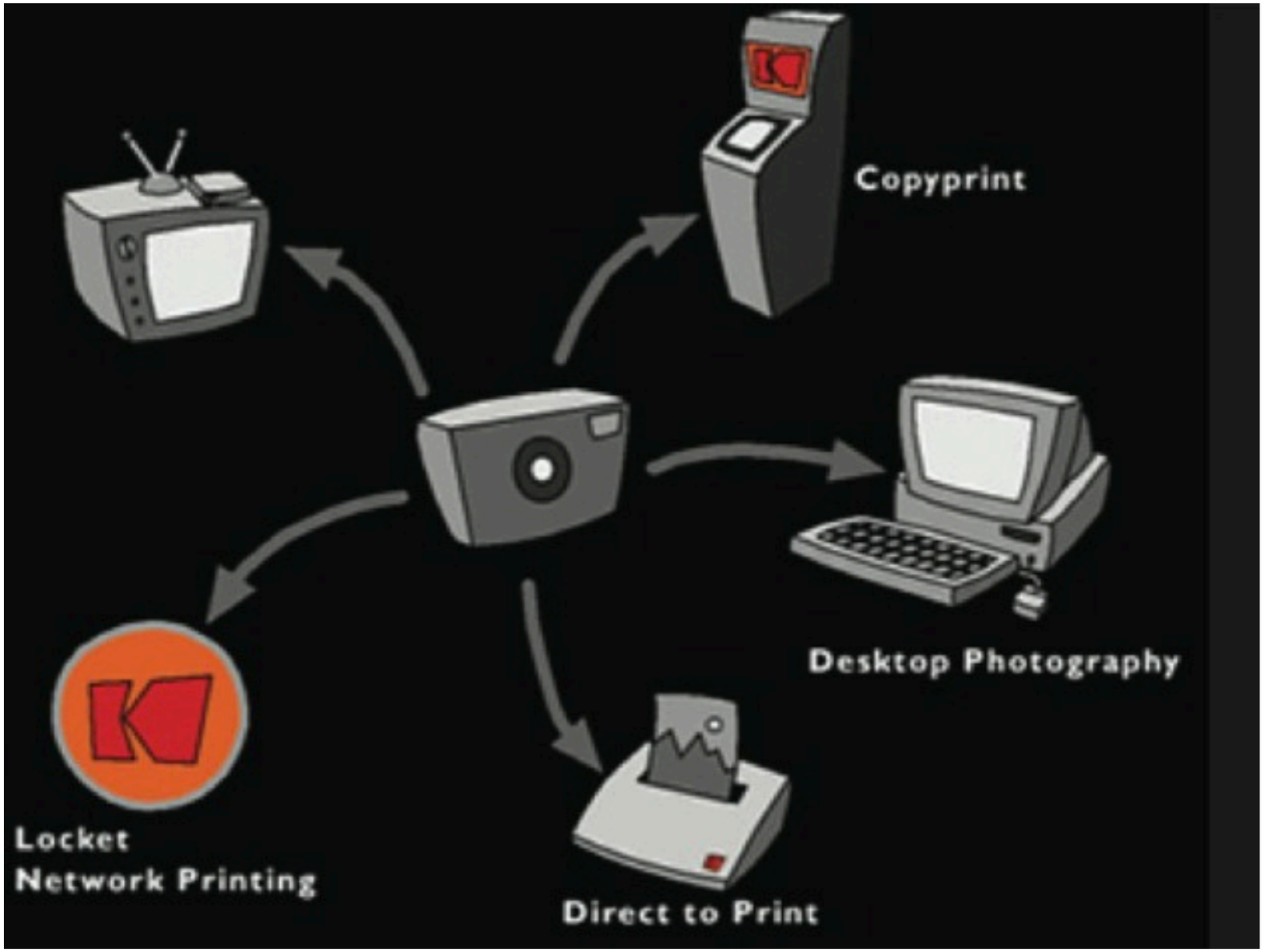
5. Ways to display

Insight:
Pictures mean very little unless you can see them, so one of the great potentials of digital photography is to increase the diversity of means of display.

Analysis:
Prints and transparencies are still valuable, and indeed a whole industry has grown up around printing, but there are also many new possibilities. Electronic displays include the television, computer screen, the electronic picture frame, the e-wallet, fridge door display, and cell phone, as well as others that will emerge in time. As digital images become more ubiquitous, it is interesting to see how we use them more habitually to illustrate a point in a conversation with a friend or to remember a piece of information. When the images are displayed electronically, they can be captured and shown at no incremental cost, so they spread into all sorts of unexpected places.

Concepts


Key Data Collection
User Research
Data Analysis
Design Concepts
Experience Prototypes
Evaluation Cycle



At the System Perspective (Zoomed Out)

A system perspective was summarized by putting the camera at the center, with connections to the computer for editing, to the printer for output, to the television for display, to online resources and agencies for sending to other people and for remote printing, and to kiosks in public places for copying and printing.

source: [3]

Concepts/Scenarios at User Perspective (Zoomed In)

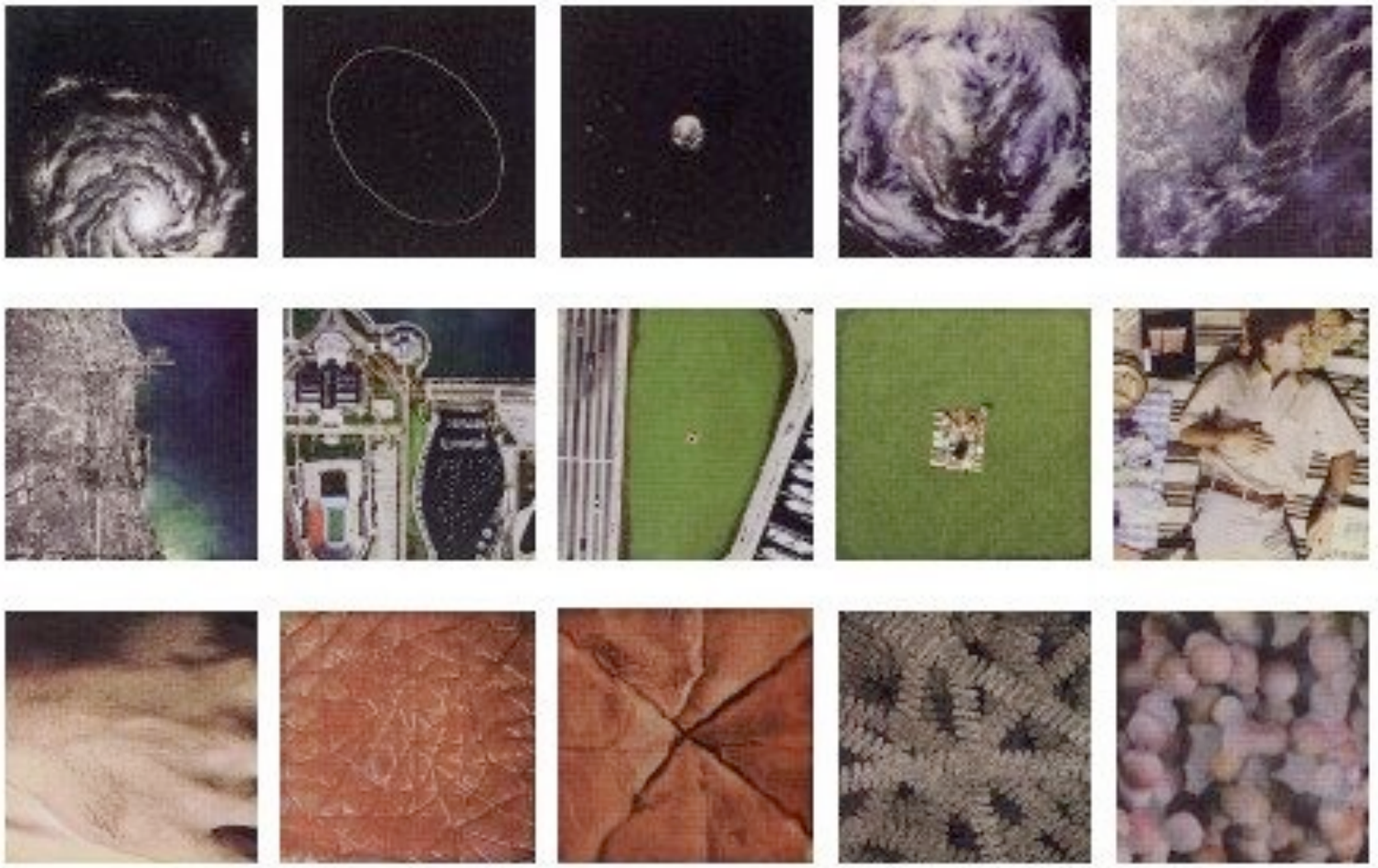
Scenarios were developed to bring the design opportunities to life. These lists of highlights were used to develop patterns of value that would appeal to Kodak's customers and formed the basis of design for the interaction architecture for the system as a whole, as well as potential business cases for analysis.

source: [3]

Zoomed Out vs. Zoomed In

‘Zoom Out vs. Zoom In’ is not a method. It’s a way of design thinking.
Interactions designers are often facing increasingly complex situations.

Zooming in and out makes them flexible and helps to define on which level to intervene.



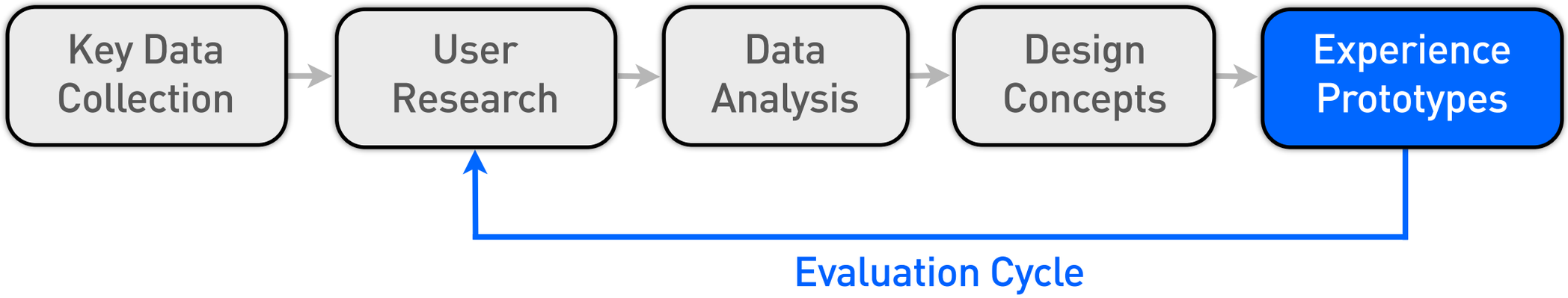
Holistic

User

Technology

http://www.matthewlangley.com/blog/uploaded_images/power_of_ten-741761.jpg

Experience Prototypes



Experience Prototype

A book of guidelines would be the conventional approach, but however interesting and beautiful they could make a book, diagrams and text would not be a very compelling form of communication. They came up with the idea of creating a working prototype of an archetype for the interaction behavior, so that the members of the development teams could experience the behaviors directly.

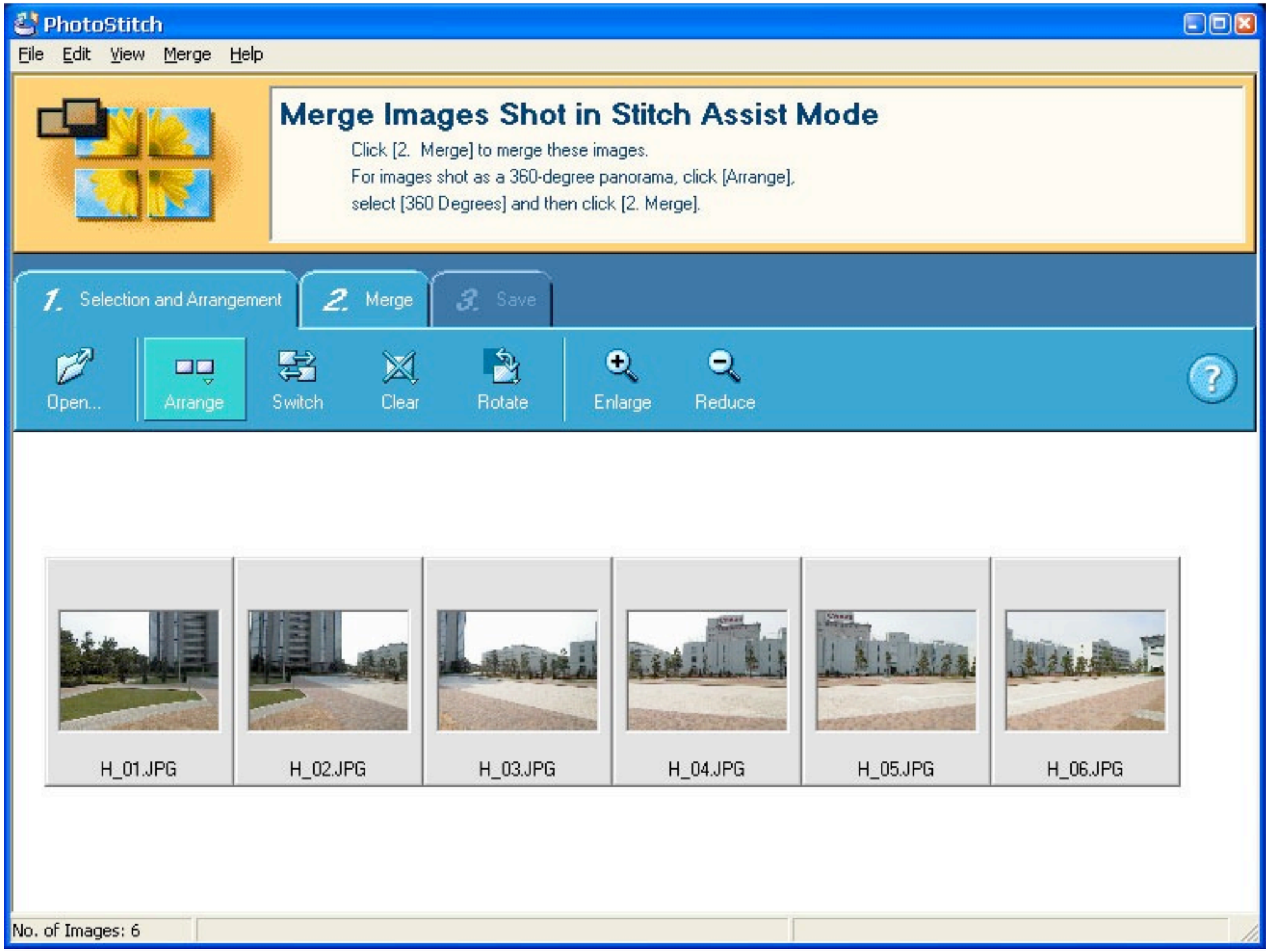
source: [3]

Rikako Sakai

-received an MA in interaction design from the Interaction Design Institute Ivrea (IDII)
-worked for Canon Design Center Tokyo
-developed the Photo-stitch Application

http://www.designinginteractions.com/interviews/MatHunter

source: [3]



http://a.img-dpreview.com/reviews/CanonG3/Images/Software/photostitch01.jpg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Looking back...

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-observing people on how they were behaving in the real world

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-step by step interfaces related to the metaphor of a light-table
-implementation of digital prototypes and testing with co-workers

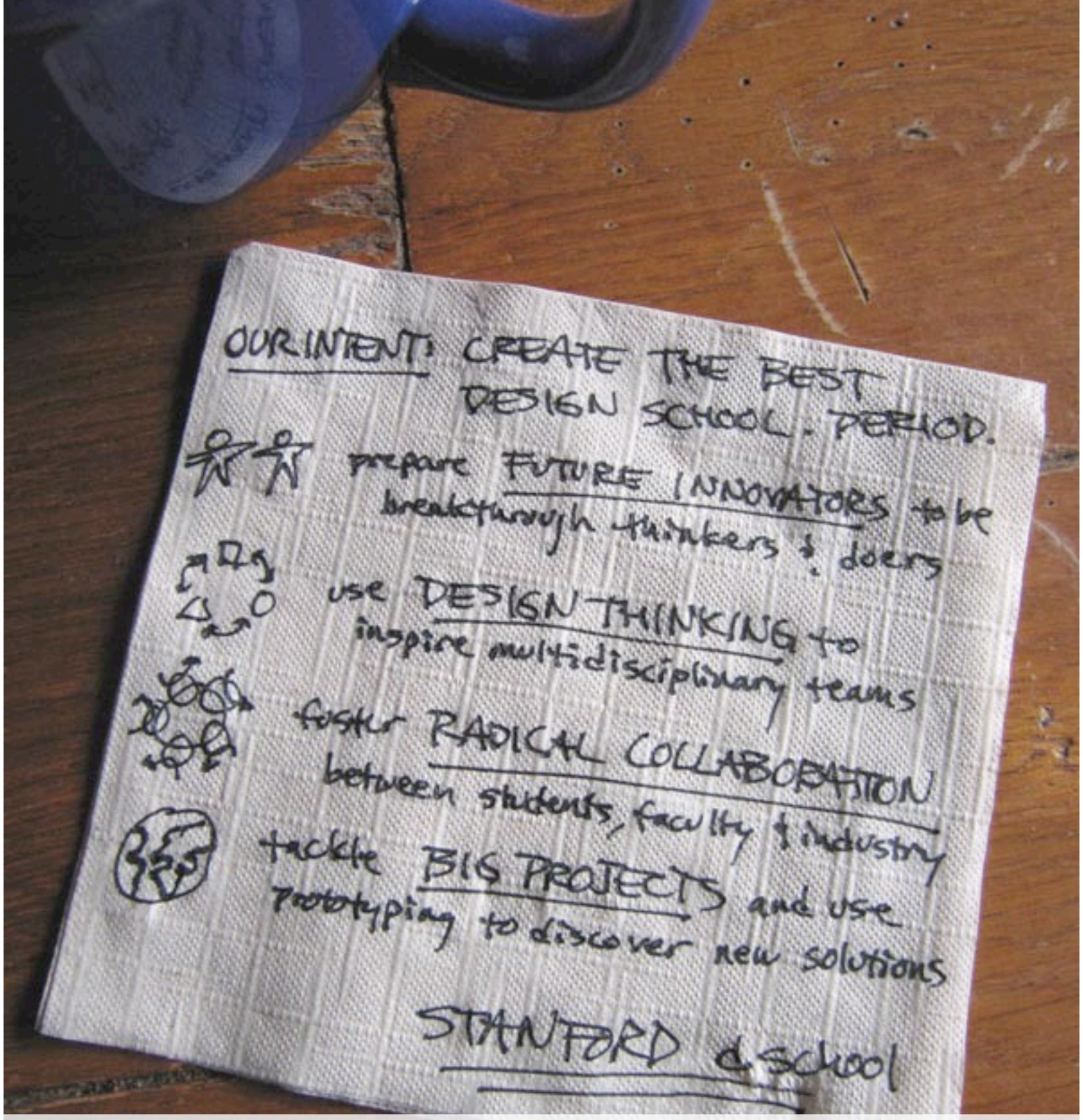
Design adopts Technology

David Kelly

-founded the company IDEO
-developed the curriculum for the Hasso Plattner Institute of Design Thinking at Stanford the: *d-school*

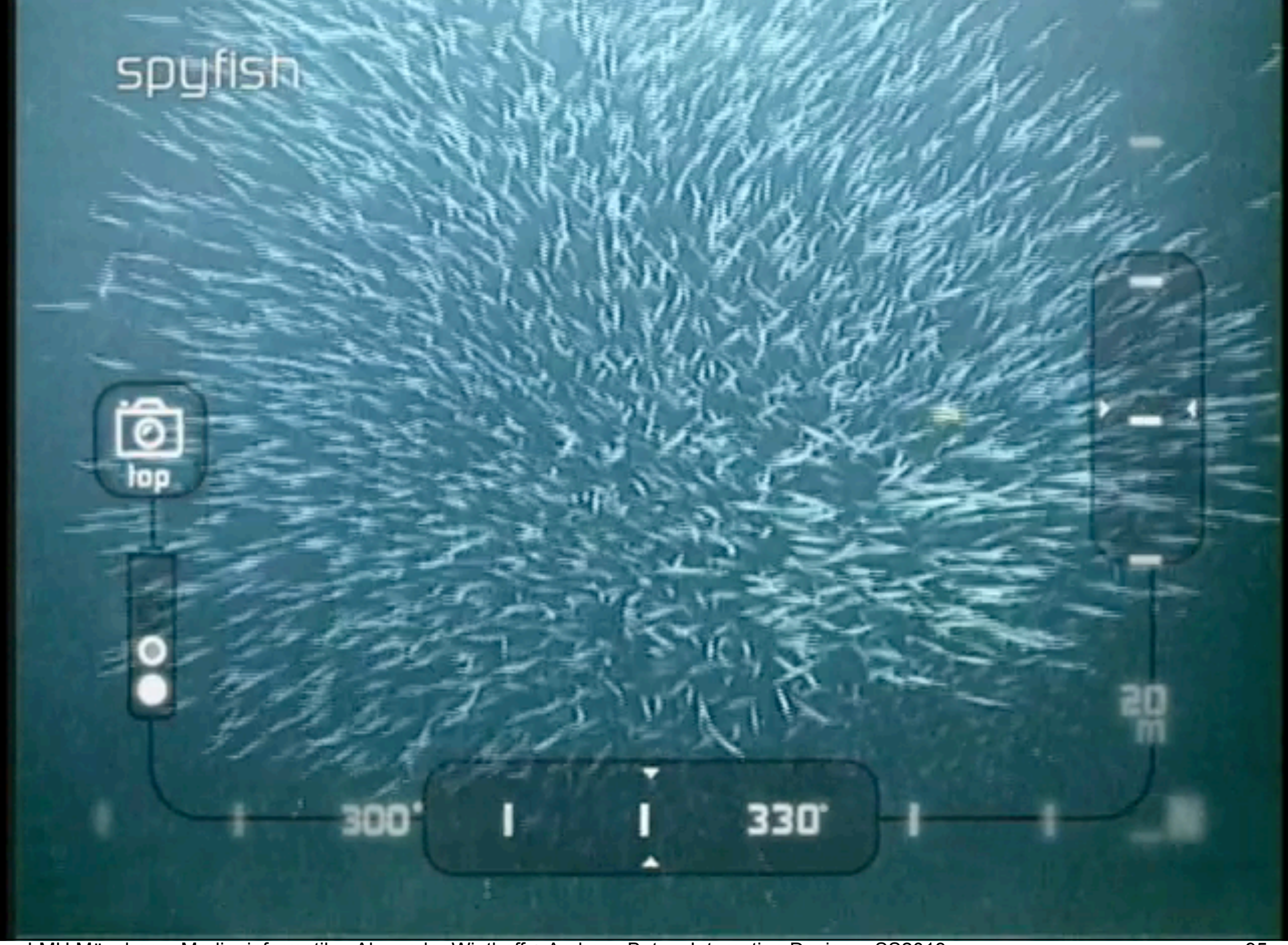
source: [3]

http://www.designinginteractions.com/interviews/DavidKelly



dschool (dschool.stanford.edu/)

http://www.stby.eu/wp/wp-content/uploads/2010/11/dschool_manifesto-550x733.jpg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-sketching the user experience through quick mockups

END Part I (History & Fundamentals)

References (Books):

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[5] Saffer, D. Designing for Interaction, *New Riders 2009.*
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