

# **User Experience Design I (Interaction Design)**

Day 2

Process Models and Usability

# Process Models, Elements and Usability

- Definition and Paradigms of UX/Interaction Design
- Process Models
- Elements of UX/Interaction Design
- Usability I

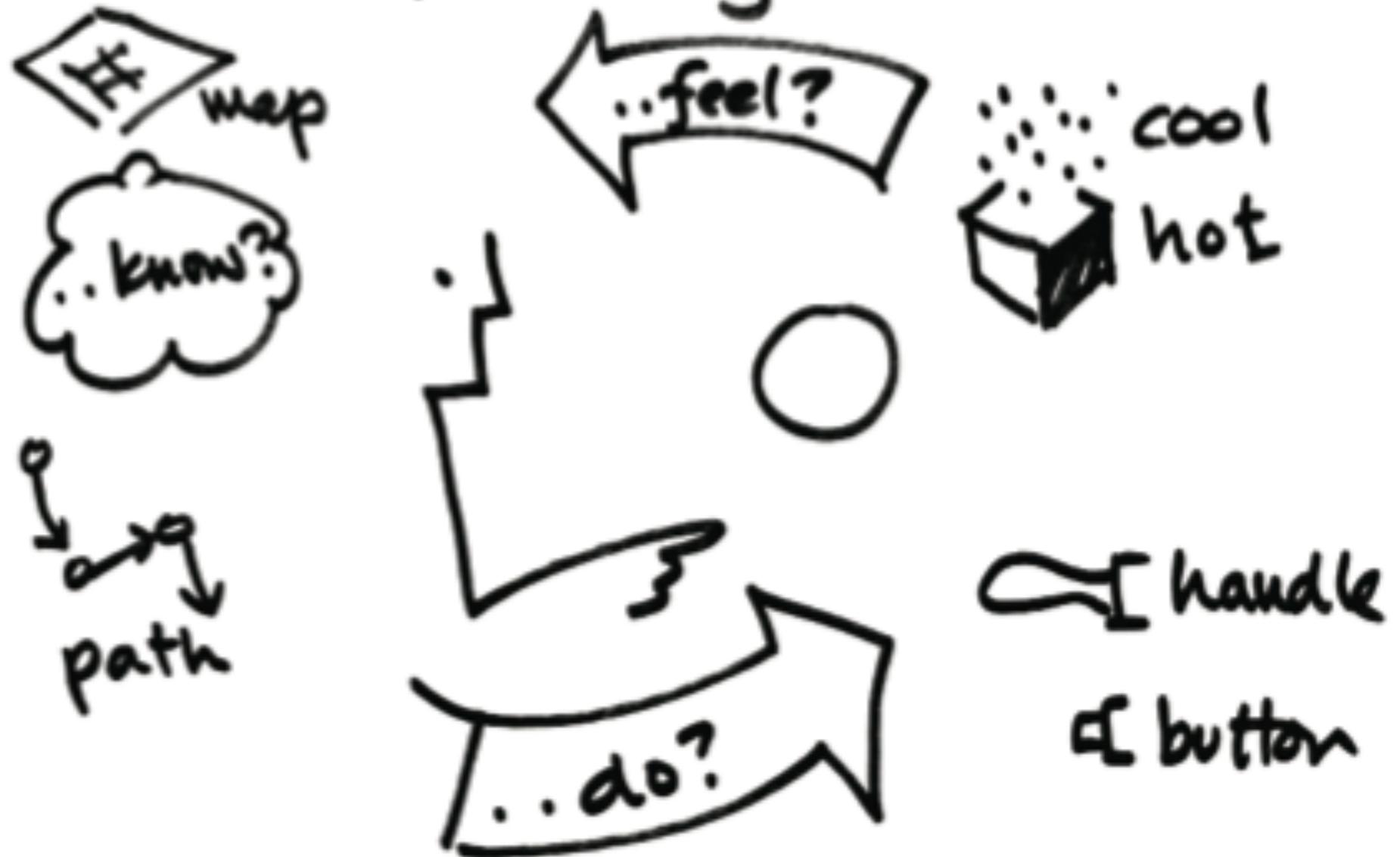


Bill Verplank



# INTERACTION

How do you...



## Bill Verplank

says that the Interaction/UX 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.

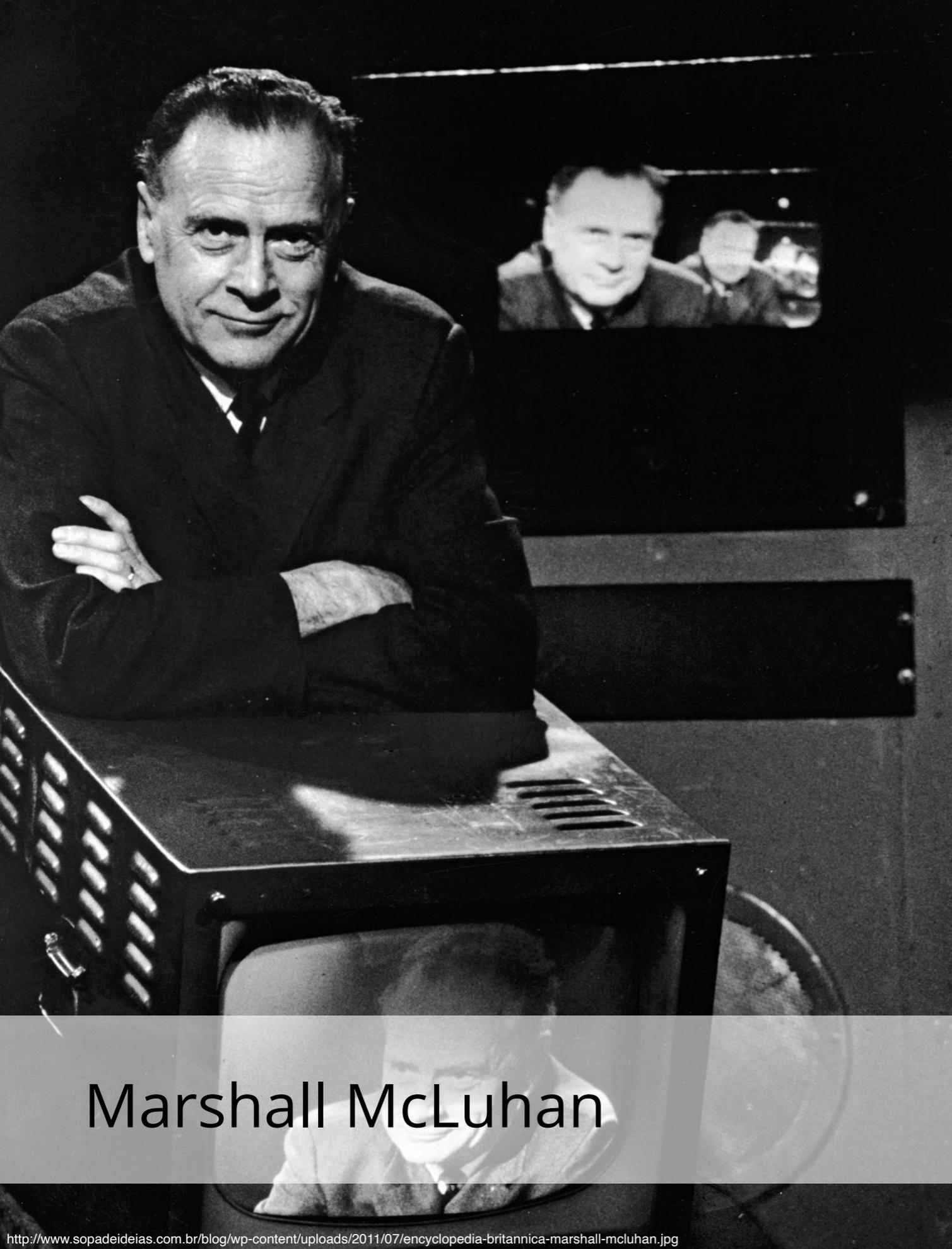
## **2. “How do you feel?”**

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?”**

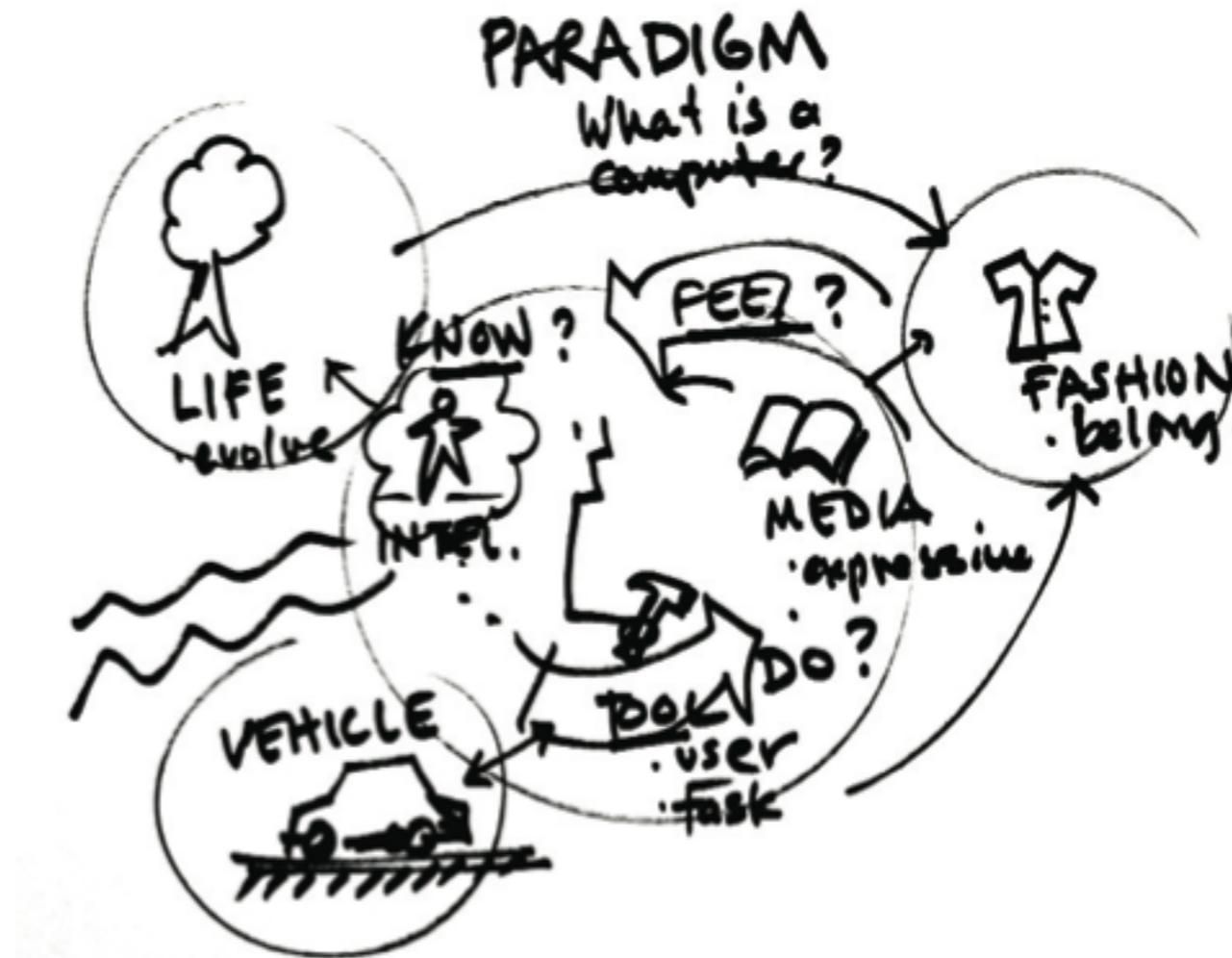
The map shows the user an overview of how everything works, and the path shows them what to do, what they need to know moment by moment



Marshall McLuhan

"Any hot medium allows of less participation than a cool one, as a lecture makes for less participation than a seminar, and a book for less than a dialogue."

# Interaction Design Paradigms



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

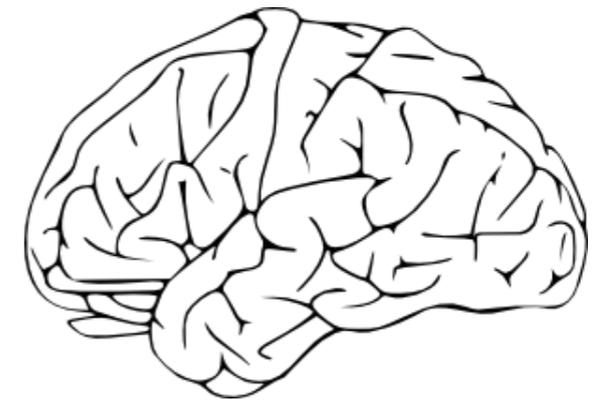
It is the set of questions that a particular community has decided are important. For interaction design there is often some confusion about what paradigm you are working with. The basic question is, What is a computer?

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.



## 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.

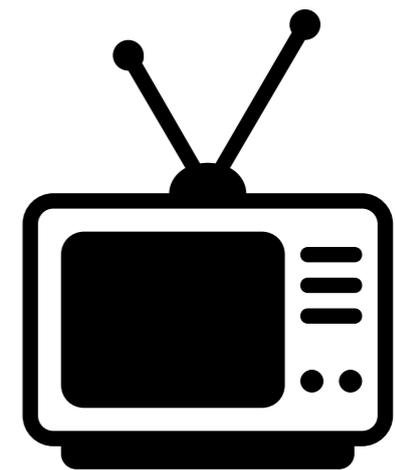


source: [3]

## 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.

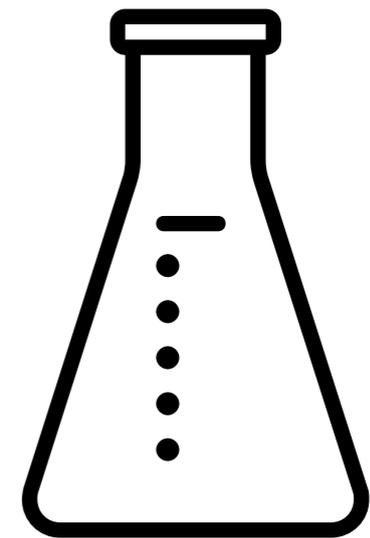


source: [3]

## 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.

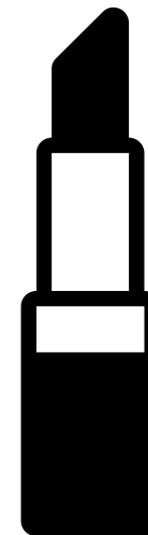


source: [3]

## 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]

# Process Models, Elements and Usability

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# User Experience Design





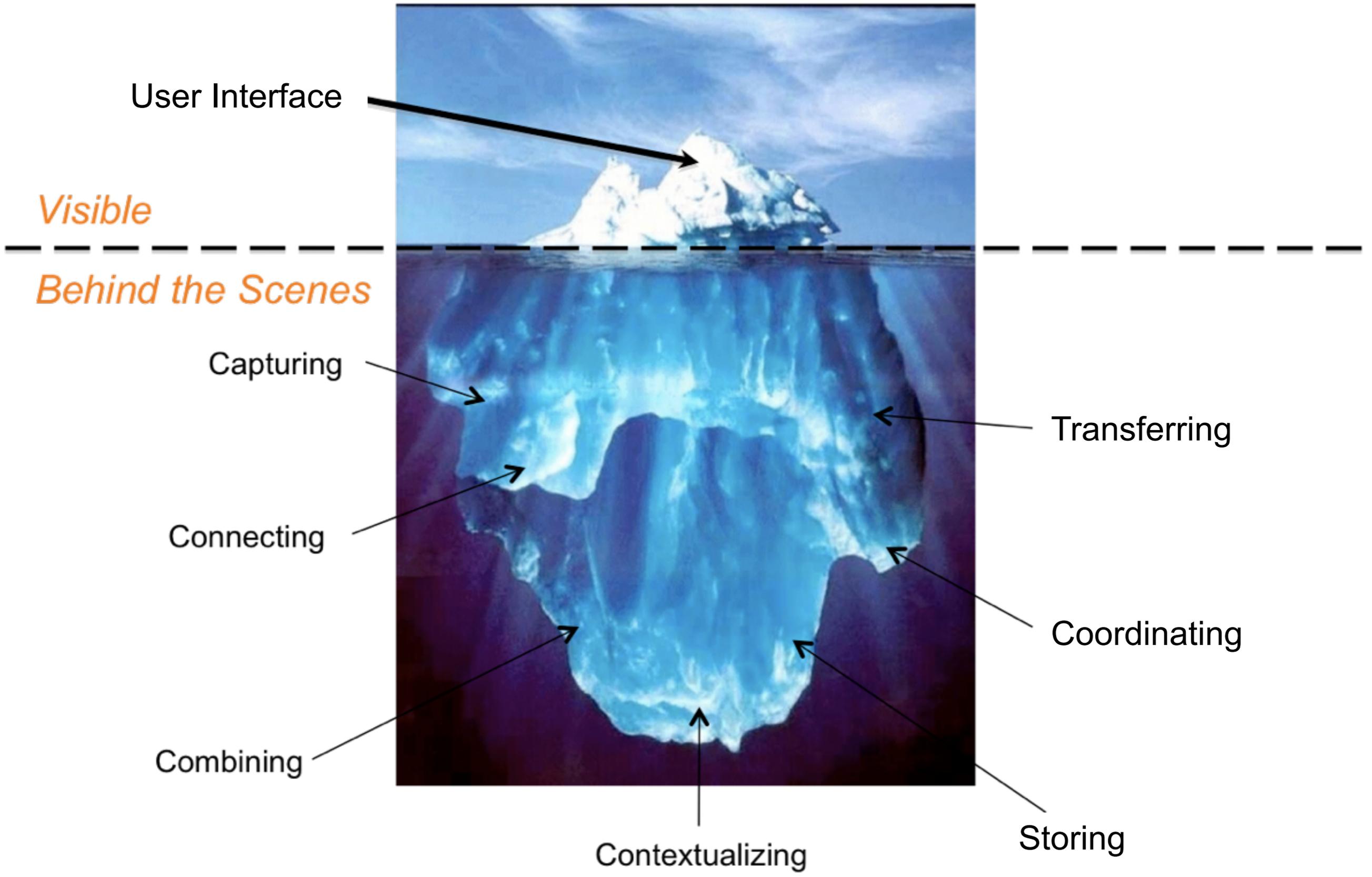
# Front Stage

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



# Back Stage

<http://blog.entrepreneurhearts.com/etablog/wp-content/uploads/2010/08/backstage.jpg>



User Interface

*Visible*

*Behind the Scenes*

Capturing

Connecting

Combining

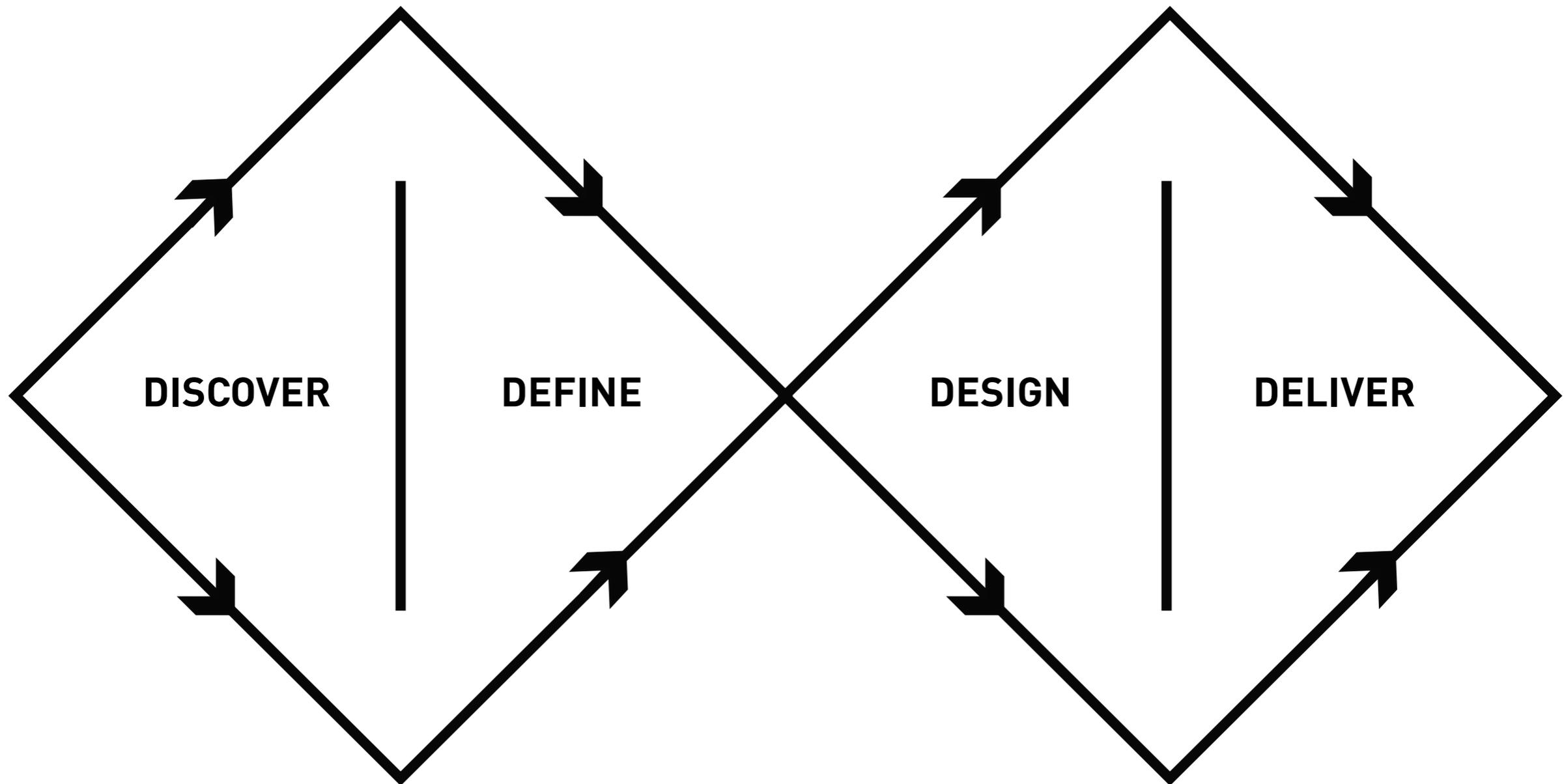
Contextualizing

Transferring

Coordinating

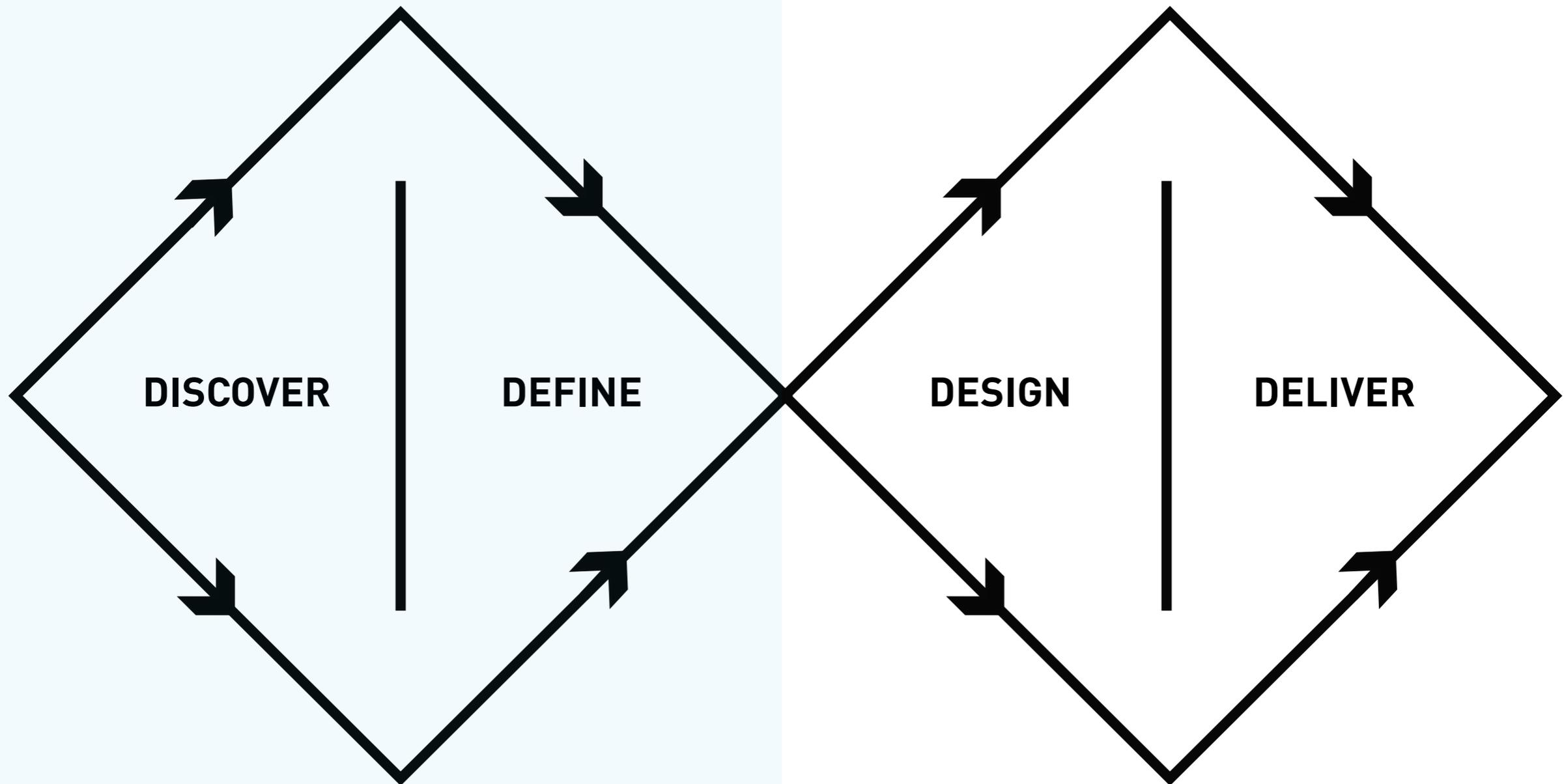
Storing

# Double Diamond



source: [8]

# Double Diamond



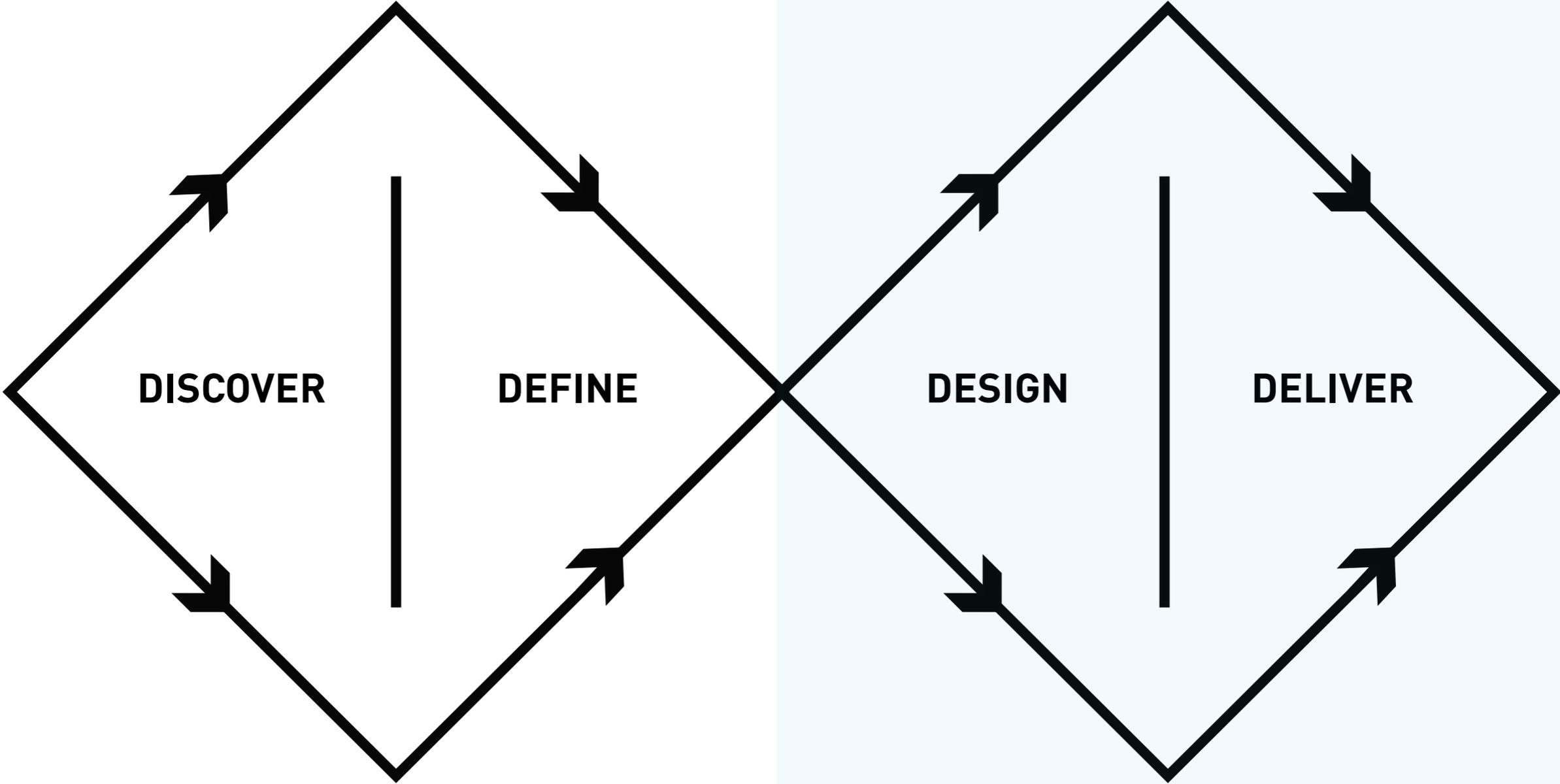
**Why? and How?**

source: [8]

# Getting the **right** Design and the Design **right**...

Bill Buxton - Sketching User Experiences

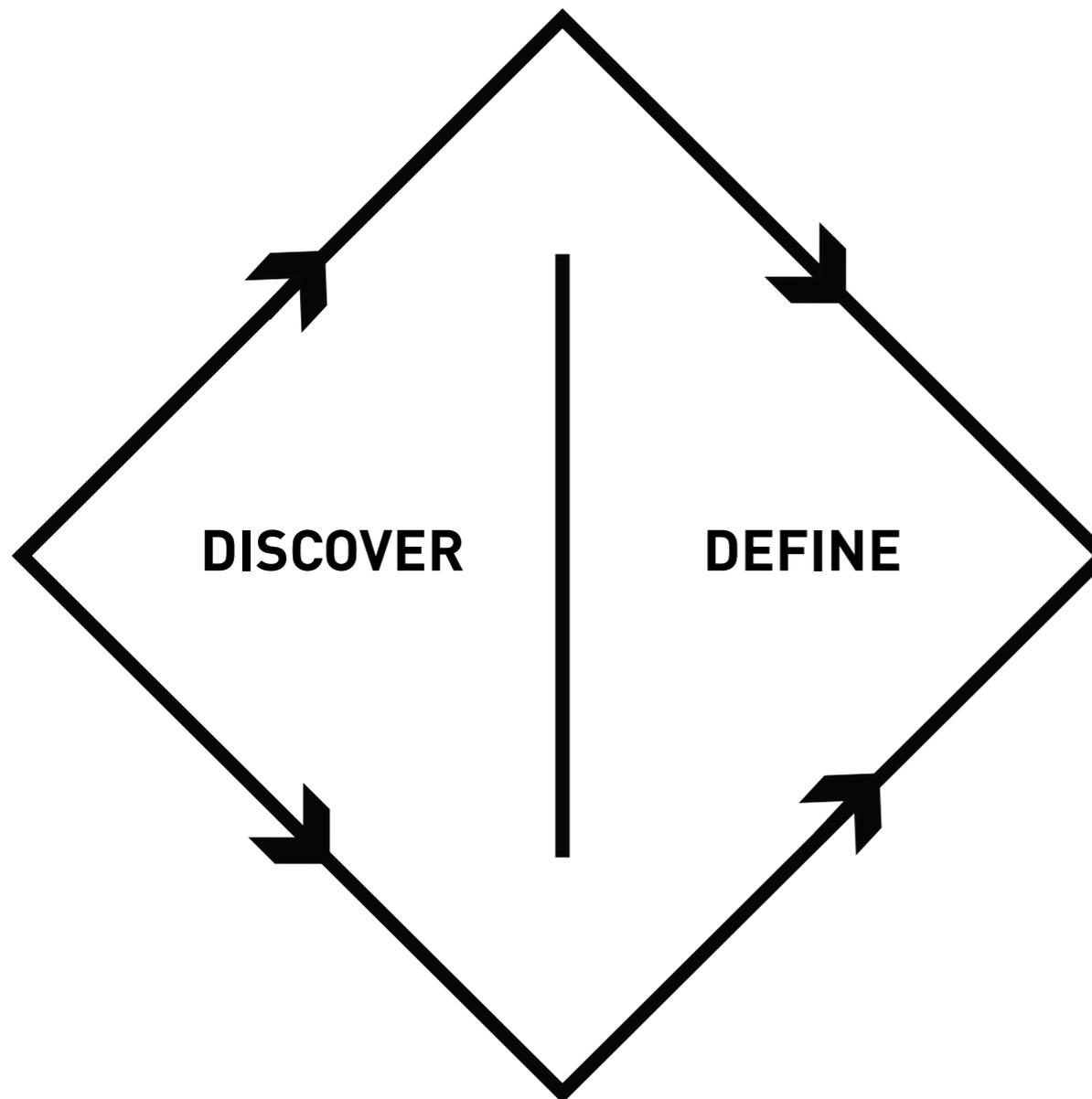
# Double Diamond



**What?**

source: [8]

# Double Diamond



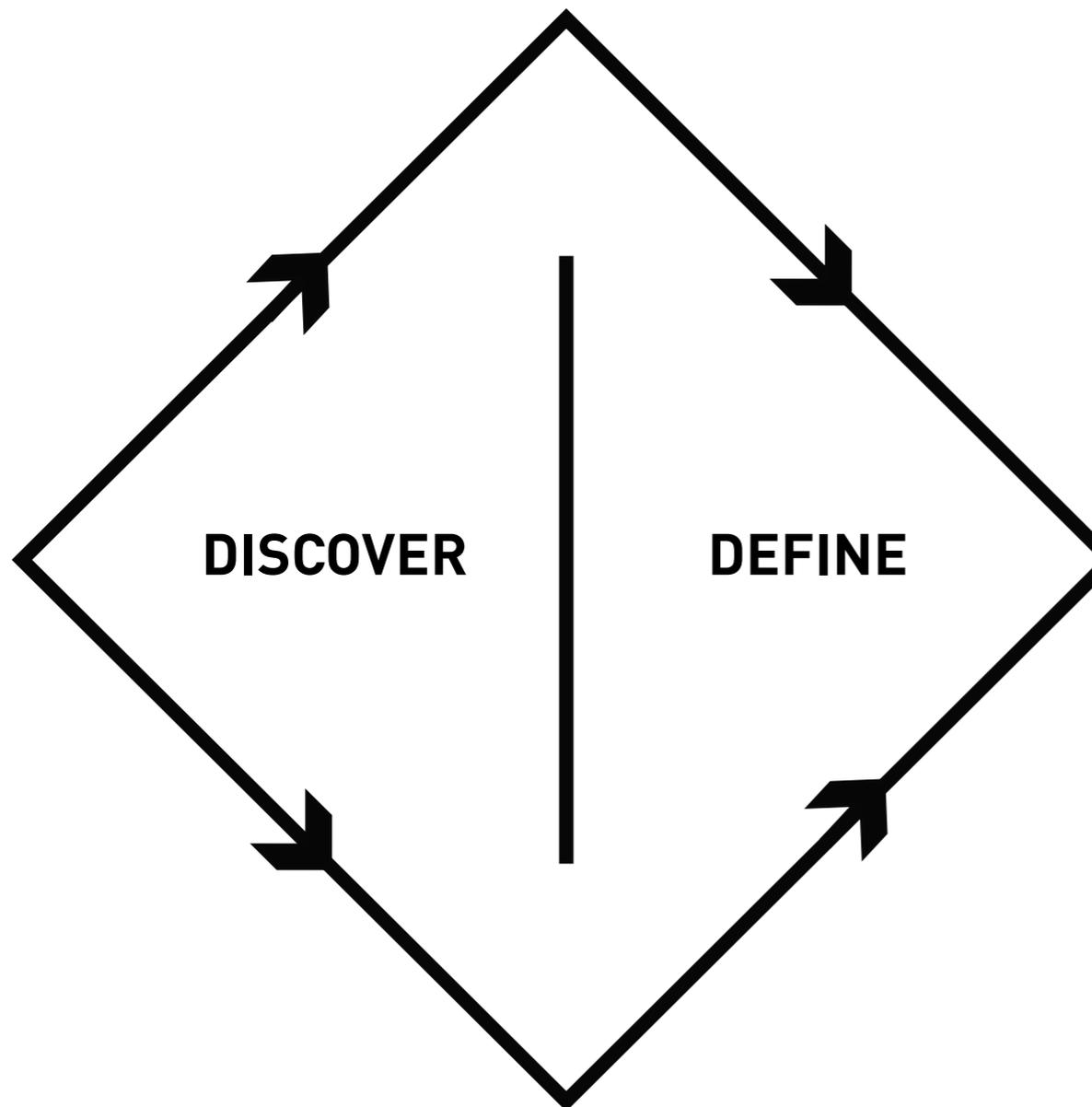
## DISCOVER STAGE

- Consumer behaviour and preferences in relation to the product or service offered by the company
- New modes of communication
- New service needs that may emerge on the basis of social, economic or environmental changes

The Discover stage helps to identify the problem, opportunity or user need that should be addressed, and introduces the space within which design can provide a solution – the playing field for design. It is important that the design process used in the company allows for ideas to be captured and developed in this way, and fosters this type of creative environment among designers and other staff.

source: [8]

# Double Diamond



## DEFINE STAGE

- The generation of initial ideas and project development
- Ongoing project management
- Corporate objectives agreed and project sign-off

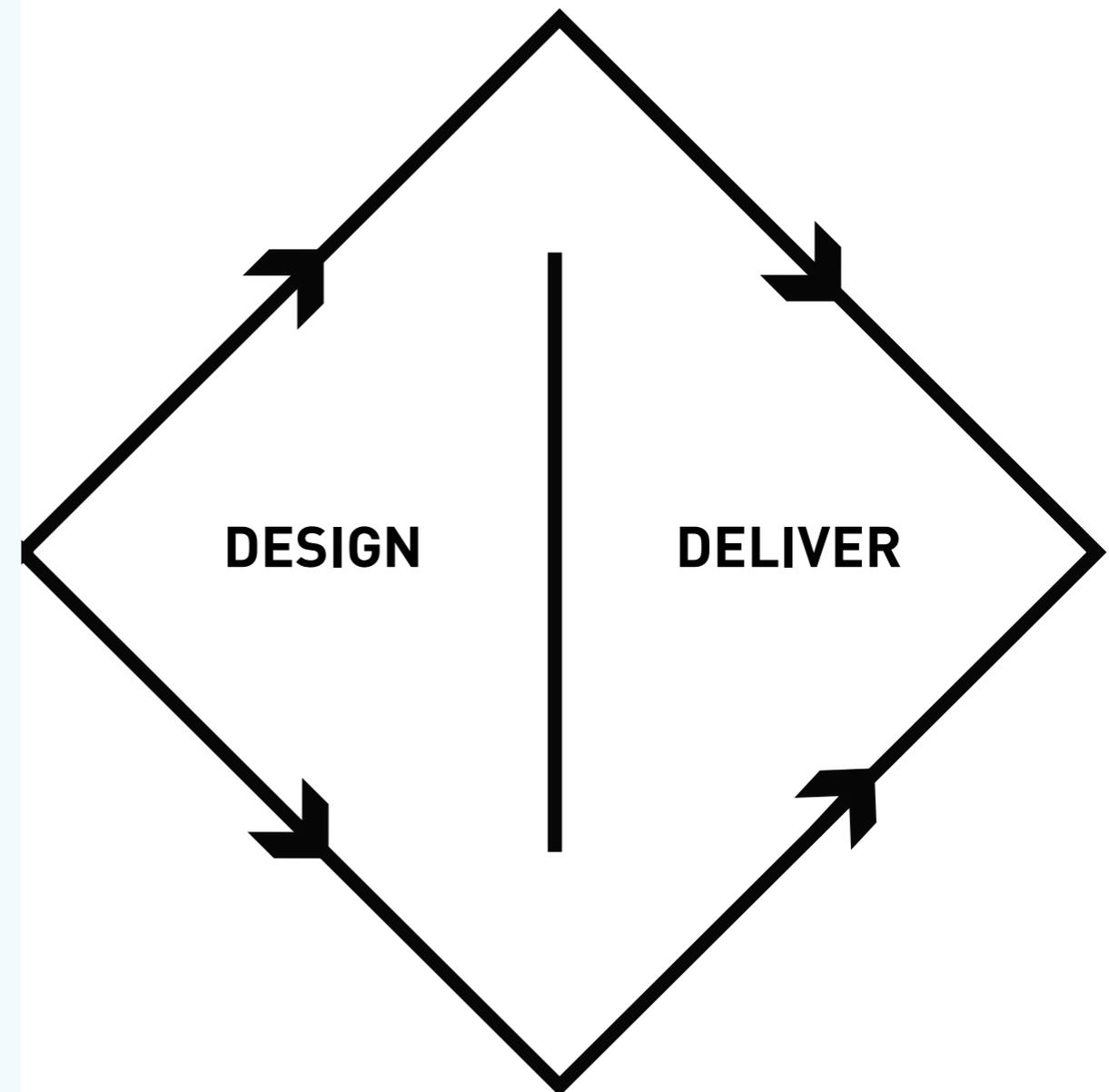
At the Define stage, a combination of the ideas or directions identified during the Discover stage are analysed and synthesised into a brief with actionable tasks related to new and existing product or service development. The Define stage ends with a clear definition of the problem(s) and a plan for how to address this through a design-led product or service. In practice, the Define stage ends in a project go-ahead through corporate level sign-off.

source: [8]

# Double Diamond

## DESIGN STAGE

- Multi-disciplinary working and dependencies with other departments
- Visual management
- Development methods
- Testing



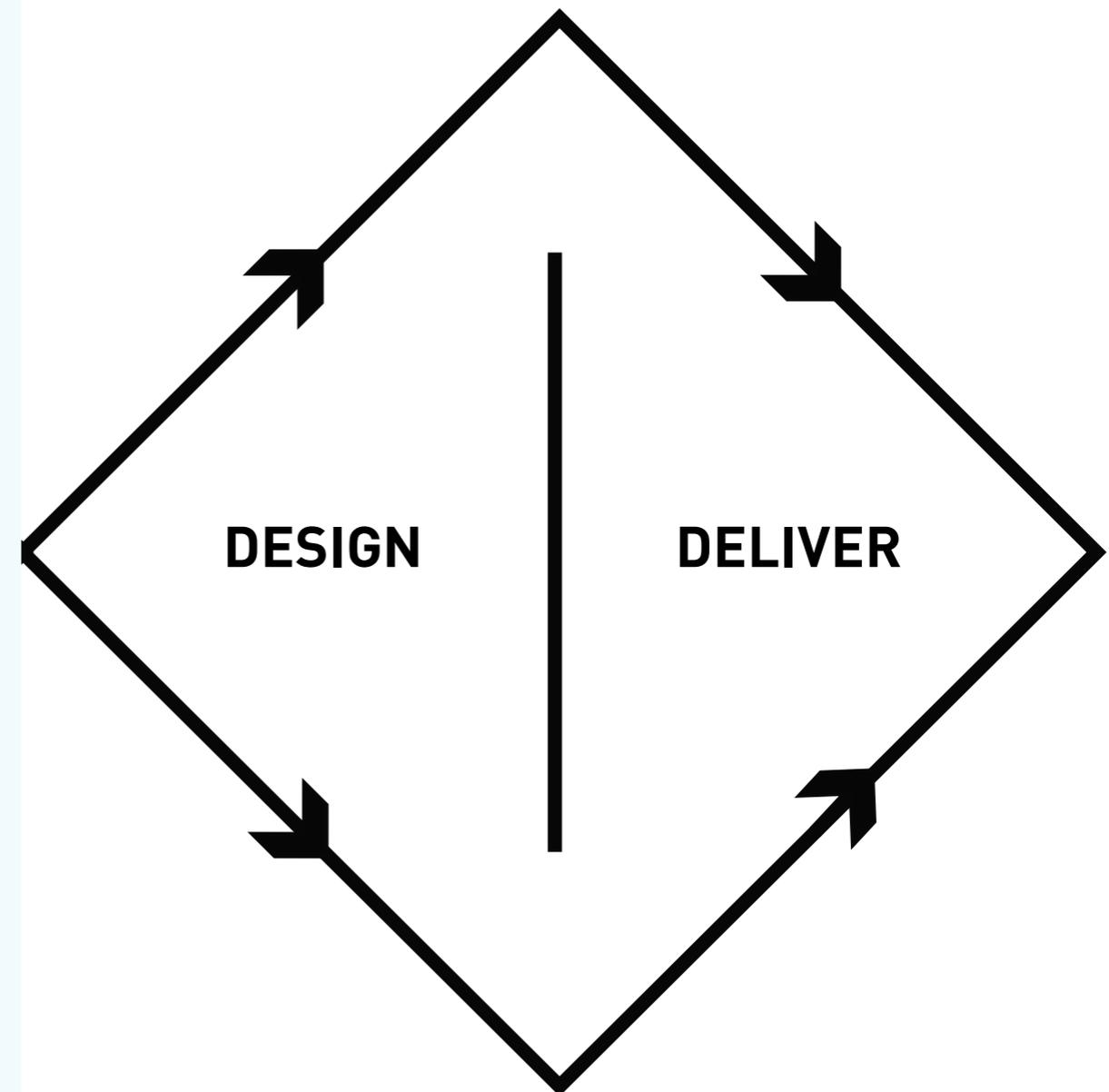
**What?**

# Double Diamond

## DELIVER STAGE

- Final testing, approval and launch
- Targets, evaluation and feedback loops.

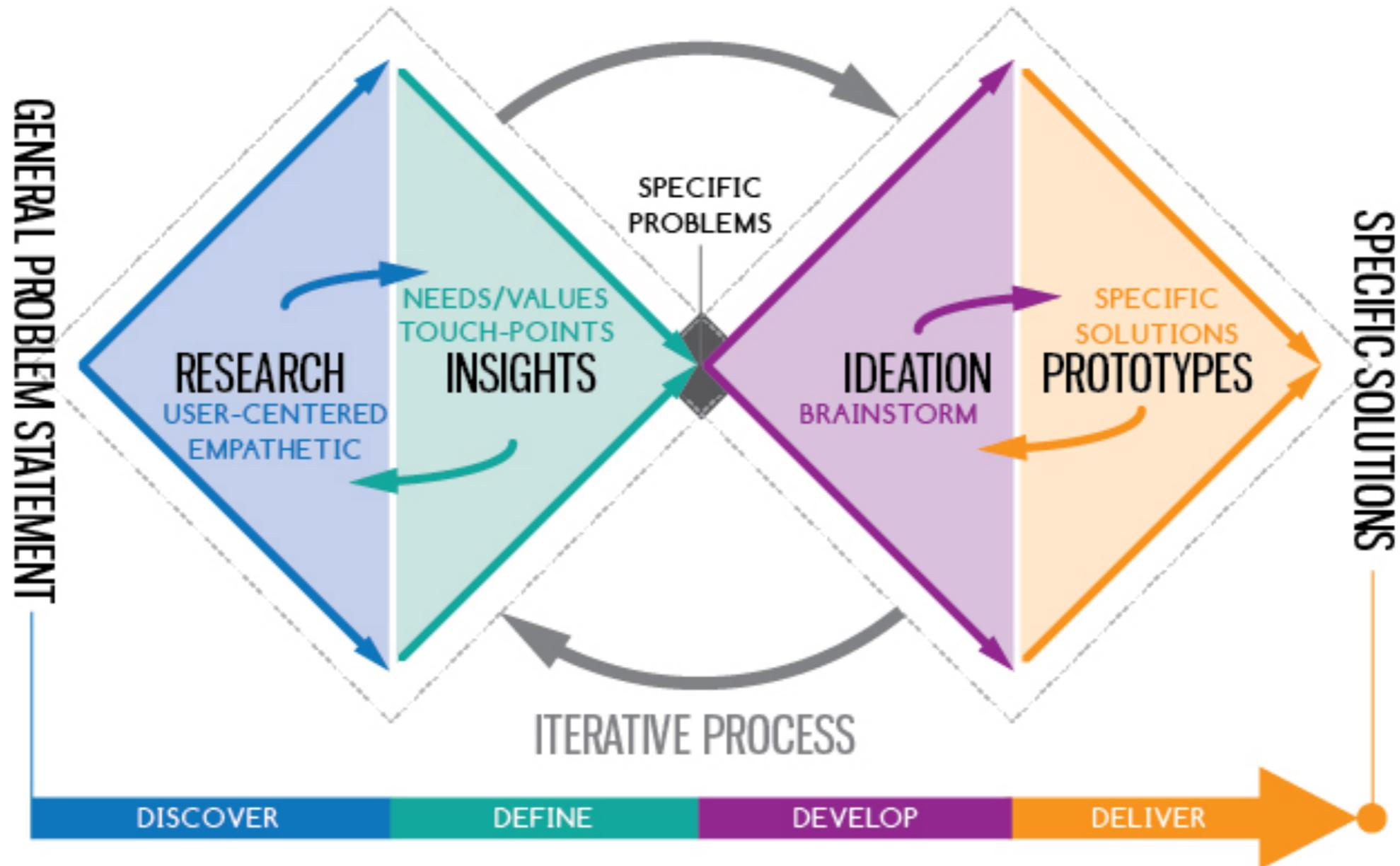
It will result in a product or service that successfully addresses the problem identified during the Discover stage. It will also include processes for feeding back lessons from the full design process to inform future projects, including methods, ways of working and relevant information.



**What?**

source: [8]

# Double Diamond DESIGN PROCESS



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**Service Design Vancouver**  
building innovation + value for businesses and people

source: [8]



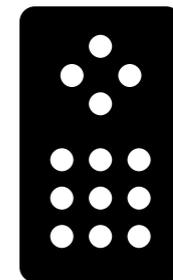
## Appearance/Affordances

## 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.



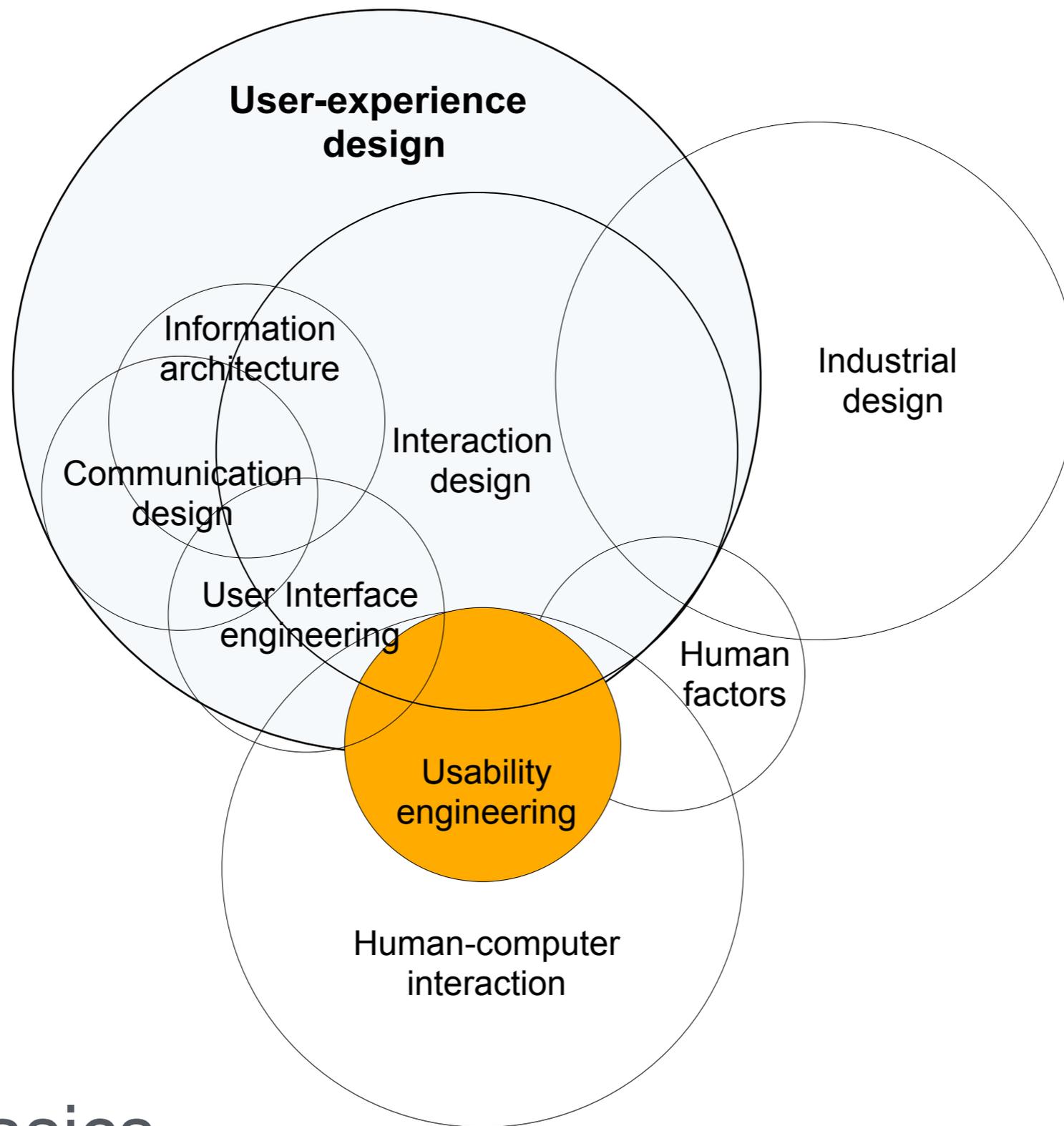
Appearance/Affordance has many variables for interaction designers to alter:

- 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.

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# Usability Basics

Usability is a term used to denote the ease with which people can employ a particular tool or other human-made object in order to achieve a particular goal.

# Benefits of usability testings

- Higher revenues through increased sales
- Increased user efficiency
- Reduced development costs
- Reduced support costs

# EXIT TICKET WITH YOU

*Thank You!*

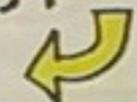


PRESS HERE TO START

COINS



PRESS GREY BOX FIRST



BILLS



CHANGE MACHINE



CREDIT CARDS



**NO** COINS IN HERE

2

PAY AMOUNT ON SCREEN

Parking Machine

ANZEIGEFELD

Einzahlung mit 2 €-Münzen nicht mehr möglich

CLINOTAX - KASSE 6, BITTE KARTE STECKEN

EINZAHLUNG

BELEG



2

HINWEIS !!!  
BERECHTIGUNG WIRD IM  
ANZEIGEFELD ANGEZEIGT

GELD-  
RÜCKGABE

B

KARTEN-  
RÜCKGABE

4



KARTE  
STECKEN



1

A



1 KARTE STECKEN  
wie abgebildet

2 TASTE(N)  
DRÜCKEN:  UND   
ODER 

3 GELD EINZAHLEN  
TASTE "BELEG" DRÜCKEN

4 KARTENRÜCKGABE-TASTE  
DRÜCKEN Karte entnehmen

GELDRÜCKGABE

A KARTE STECKEN  
Auf Wunsch Taste BELEG drücken

B GELDRÜCKGABE-TASTE  
DRÜCKEN, Karte entnehmen

### Wichtige Hinweise

für unsere Patienten

Bei Nichtbenutzen der Clinotax-  
Magnetkarte verfällt das darauf  
gespeicherte Guthaben  
nach 30 Tagen

Bitte bei Geldrückgabe beachten:

Auszahlung nur in vollen  
10 Cent-Beträgen (abgerundet)  
möglich!

Phone/TV Card Charger



# Wedding Planer



## Lock & Handle



## OK Button



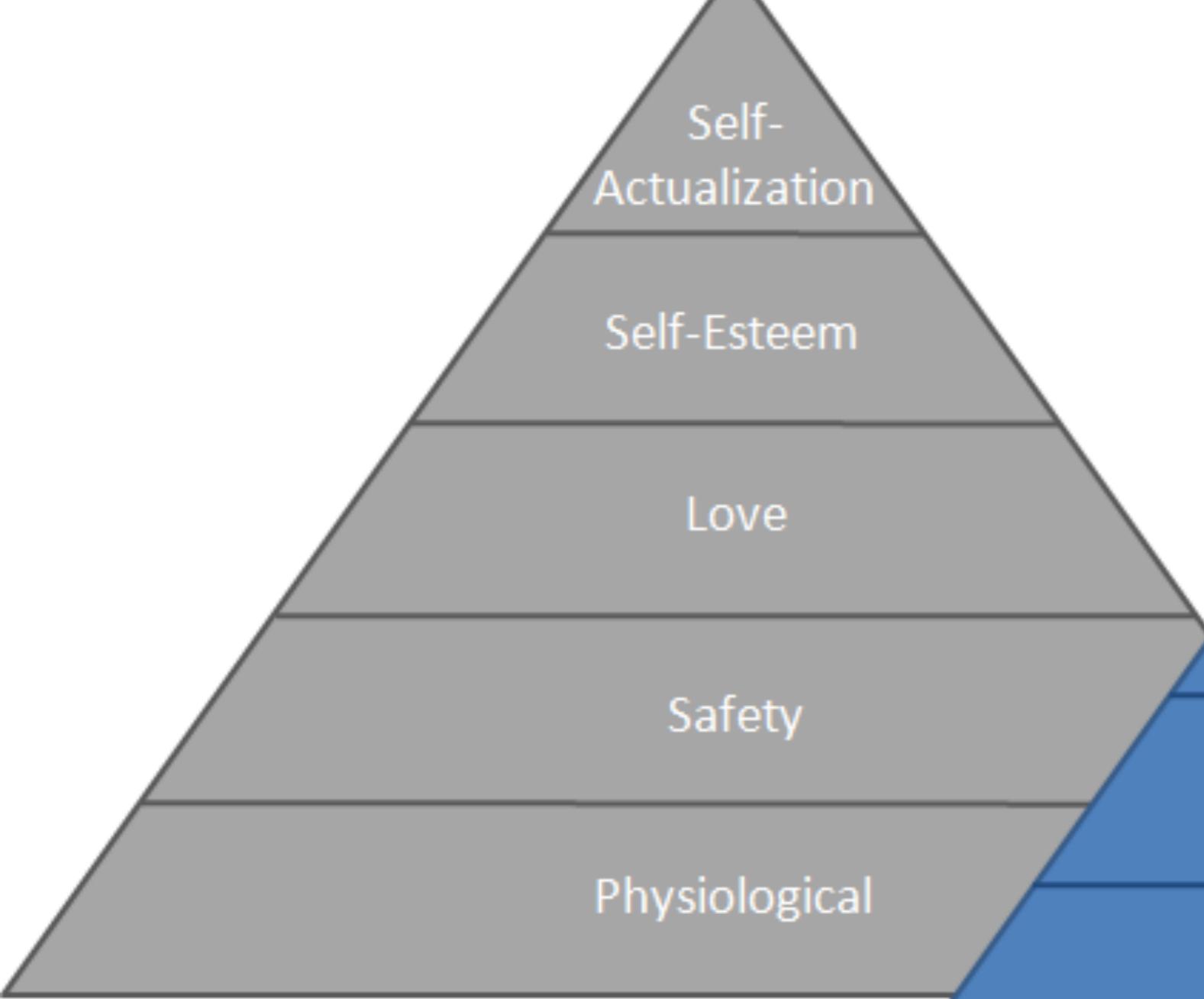
# Remote Control



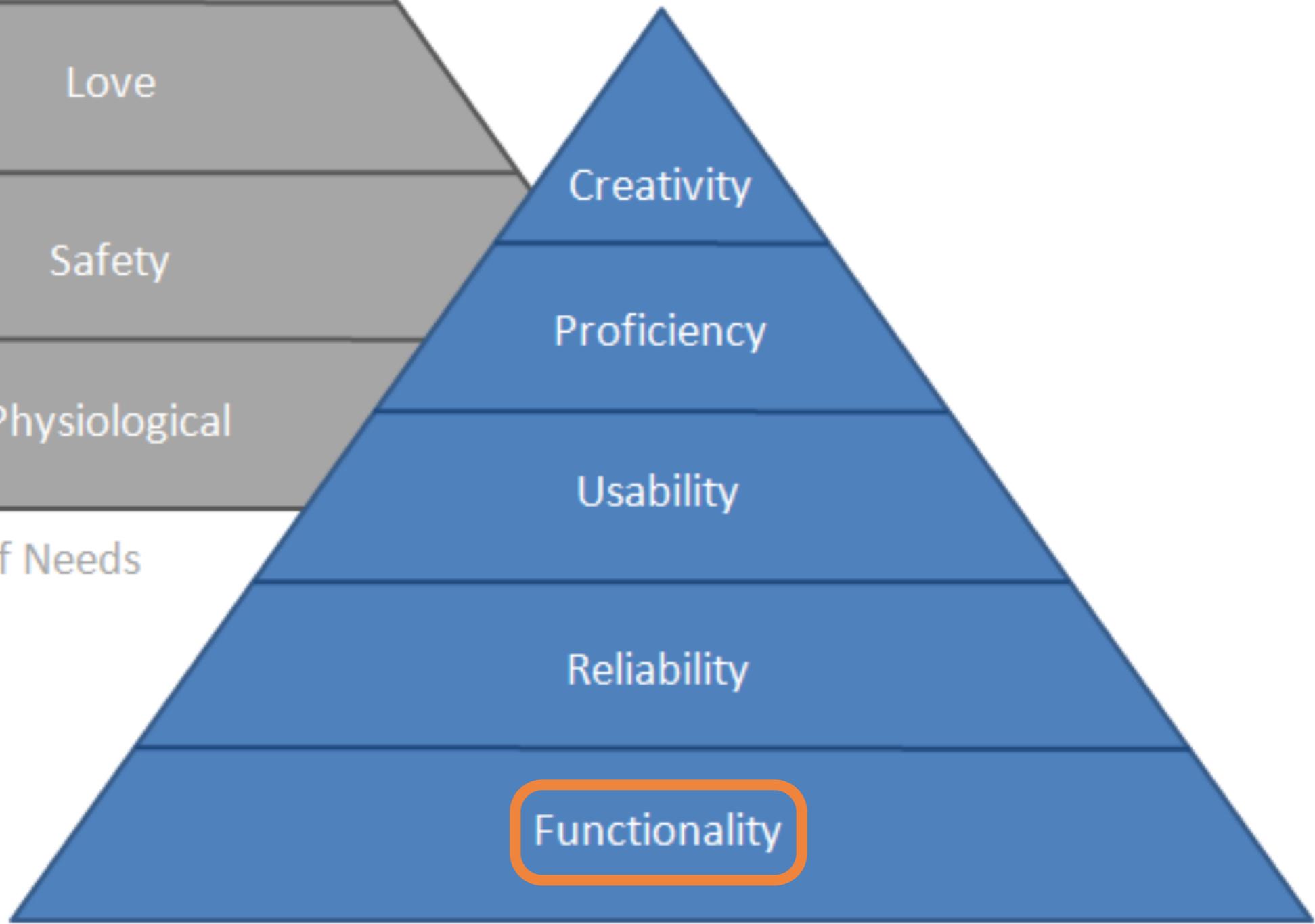
# Remote Control

# Hierarchy of **Design Needs**

(Lidwell: Universal Principles of Design, 2003)



Maslow's Hierarchy of Needs

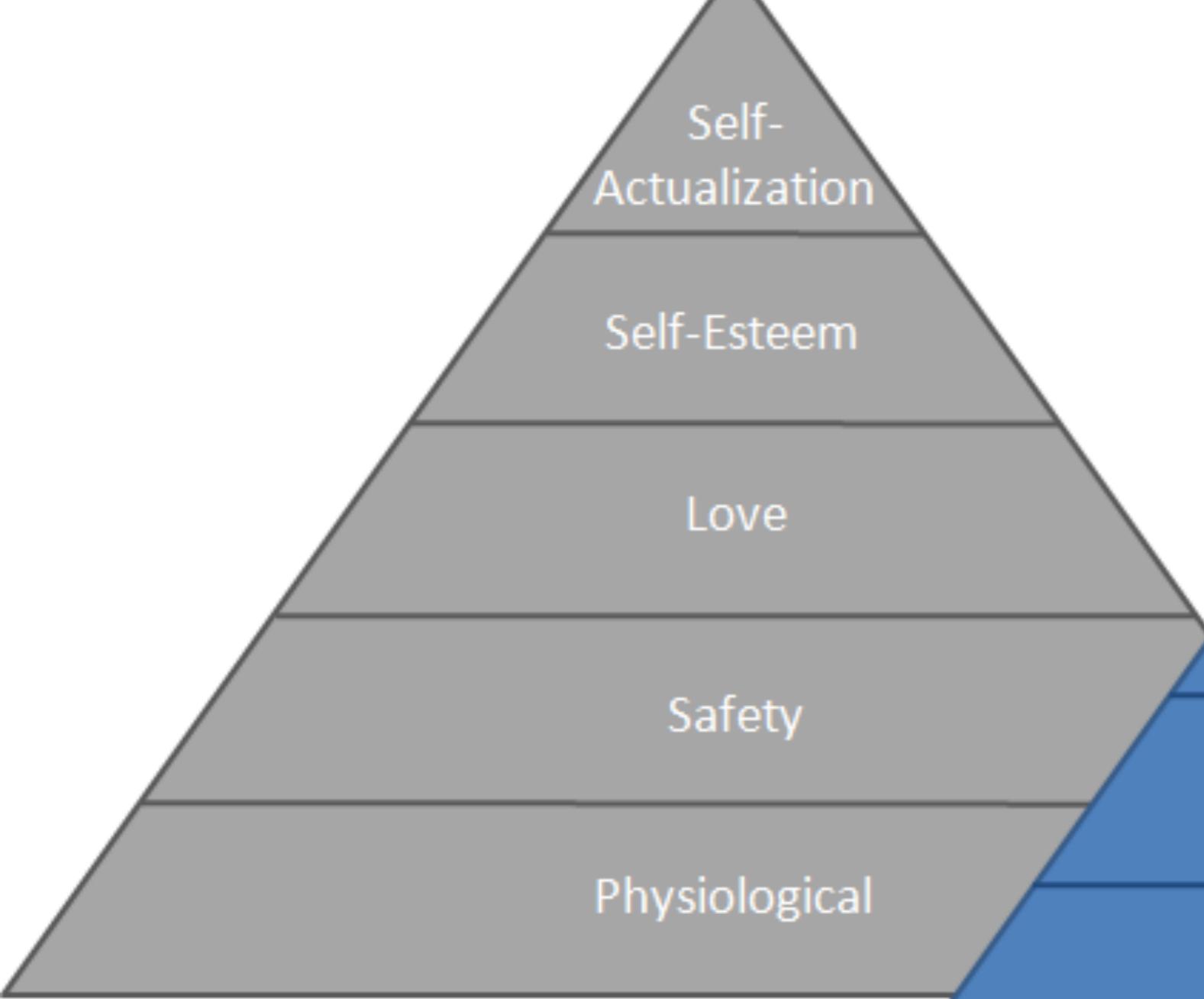


Design Hierarchy of Needs

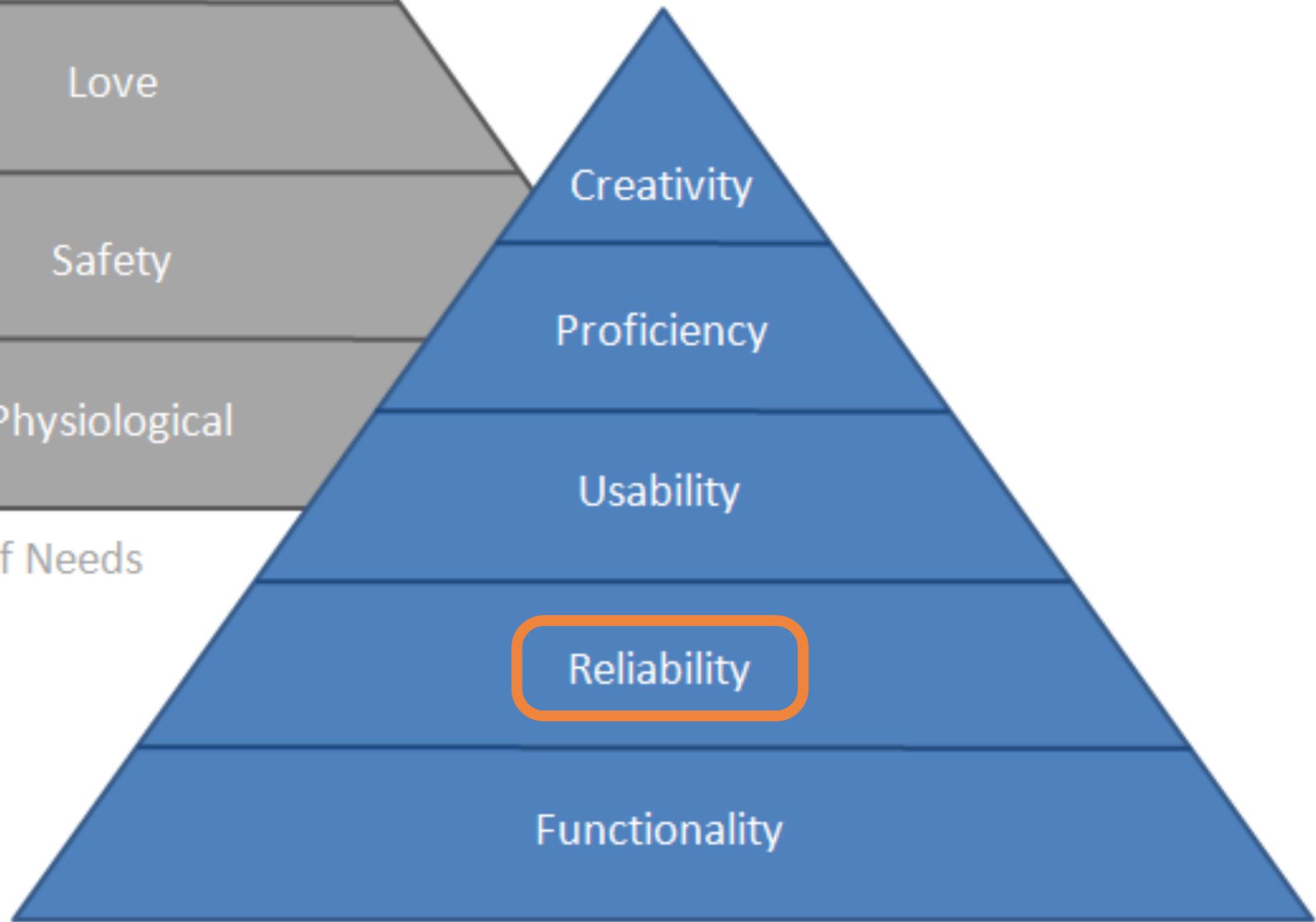
source: [7]

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

For example a HDD 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.



Maslow's Hierarchy of Needs

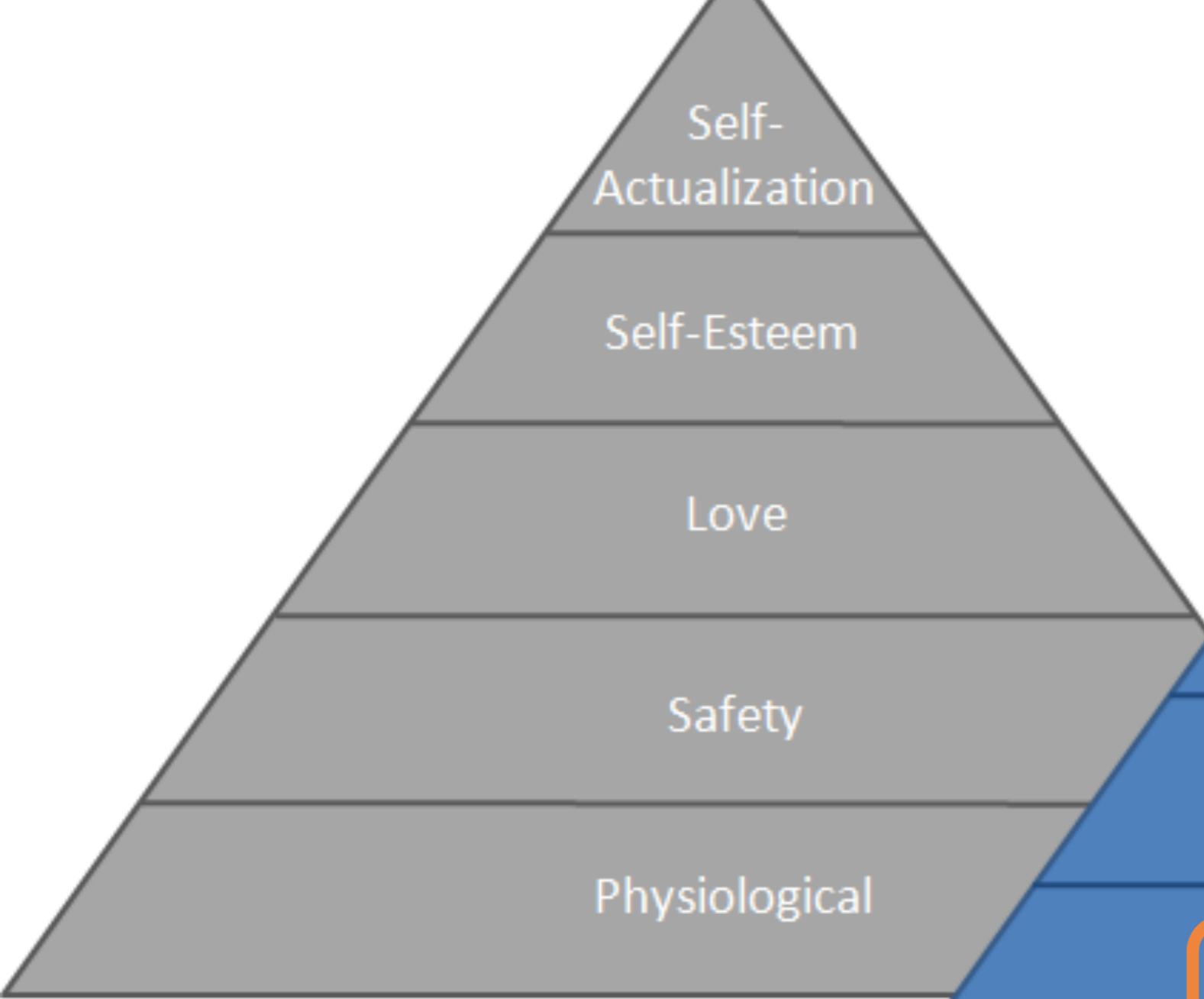


Design Hierarchy of Needs

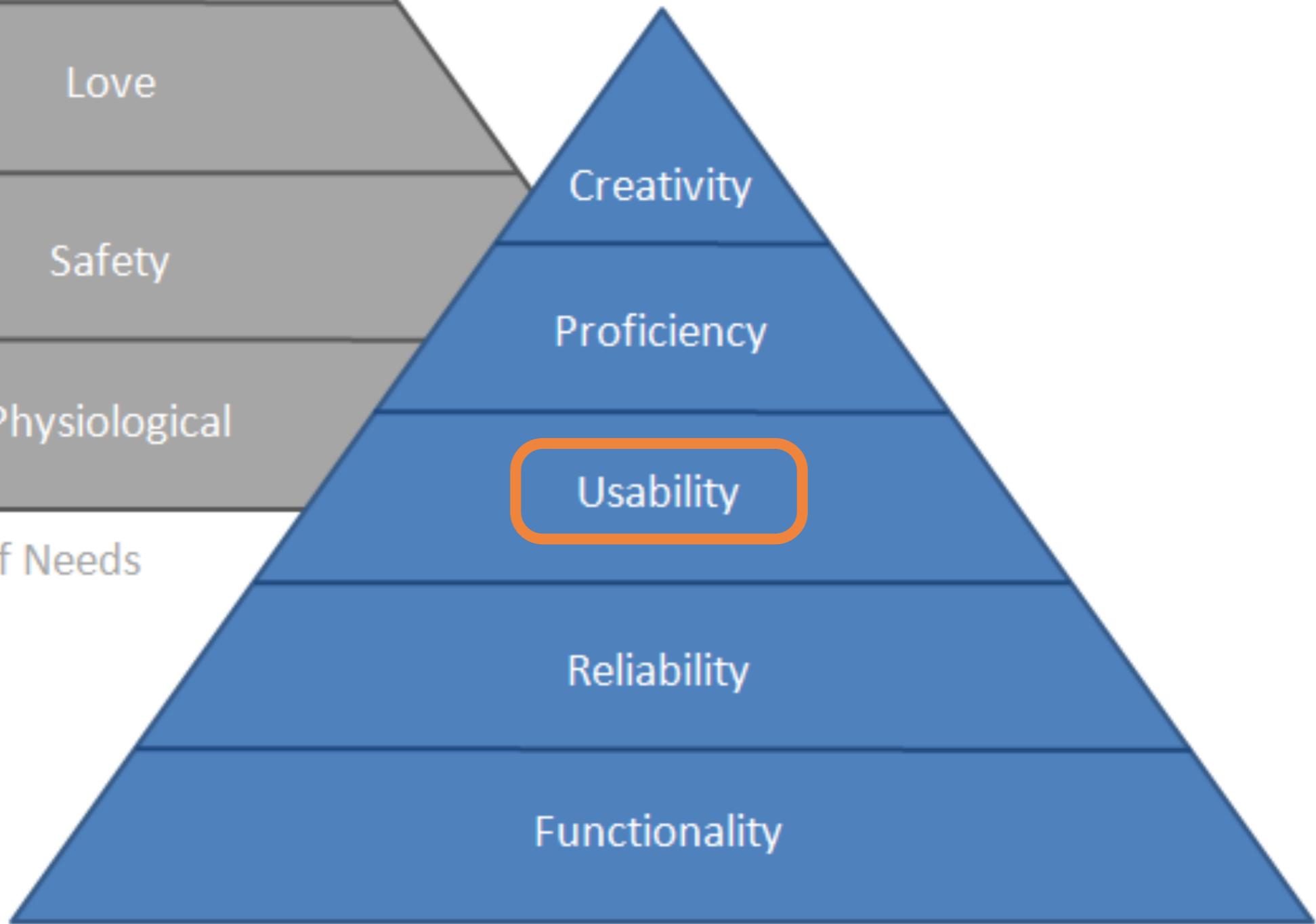
source: [7]

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

For example a HDD 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



Maslow's Hierarchy of Needs

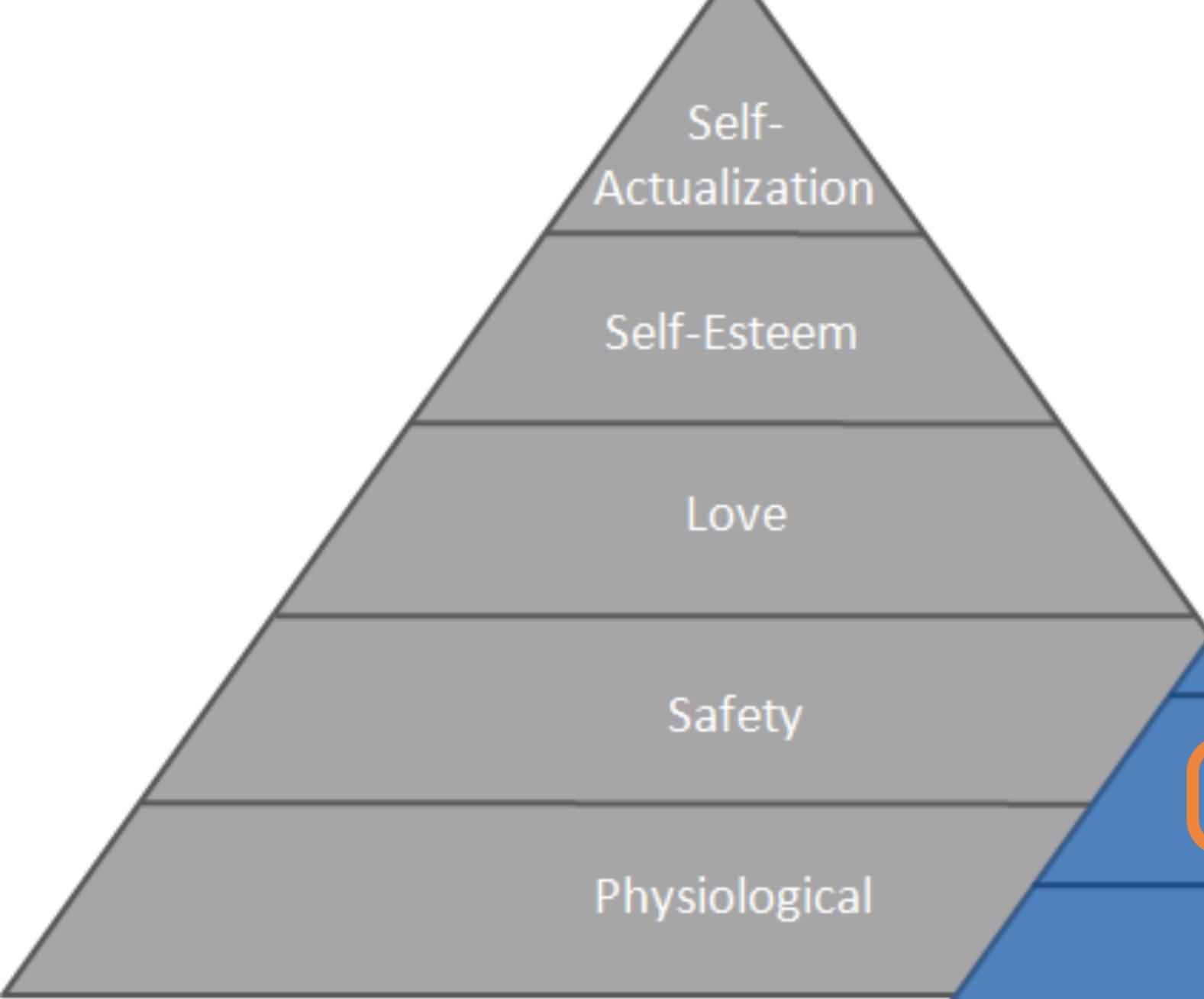


Design Hierarchy of Needs

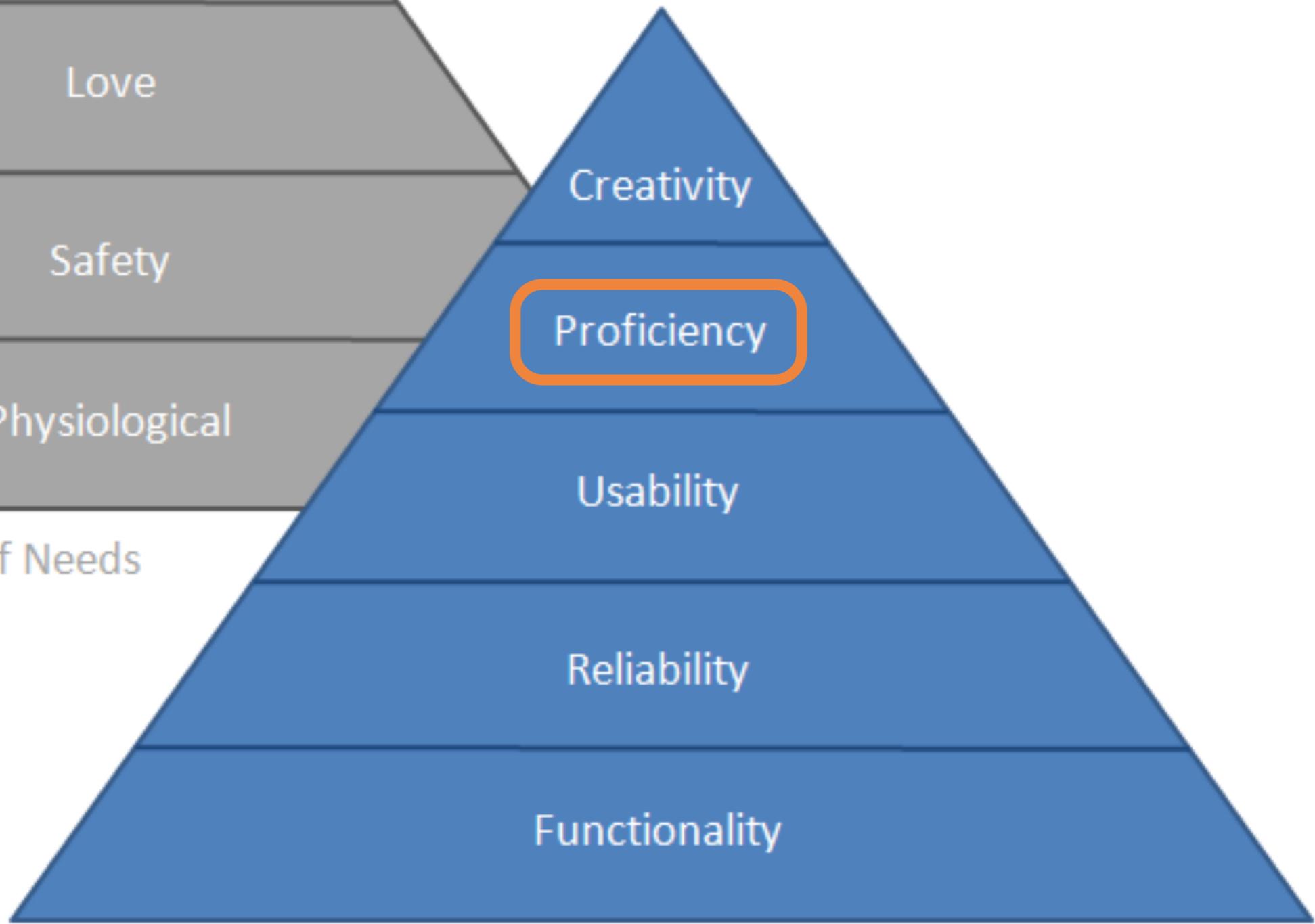
source: [7]

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

For example, configuring a HDD 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.



Maslow's Hierarchy of Needs

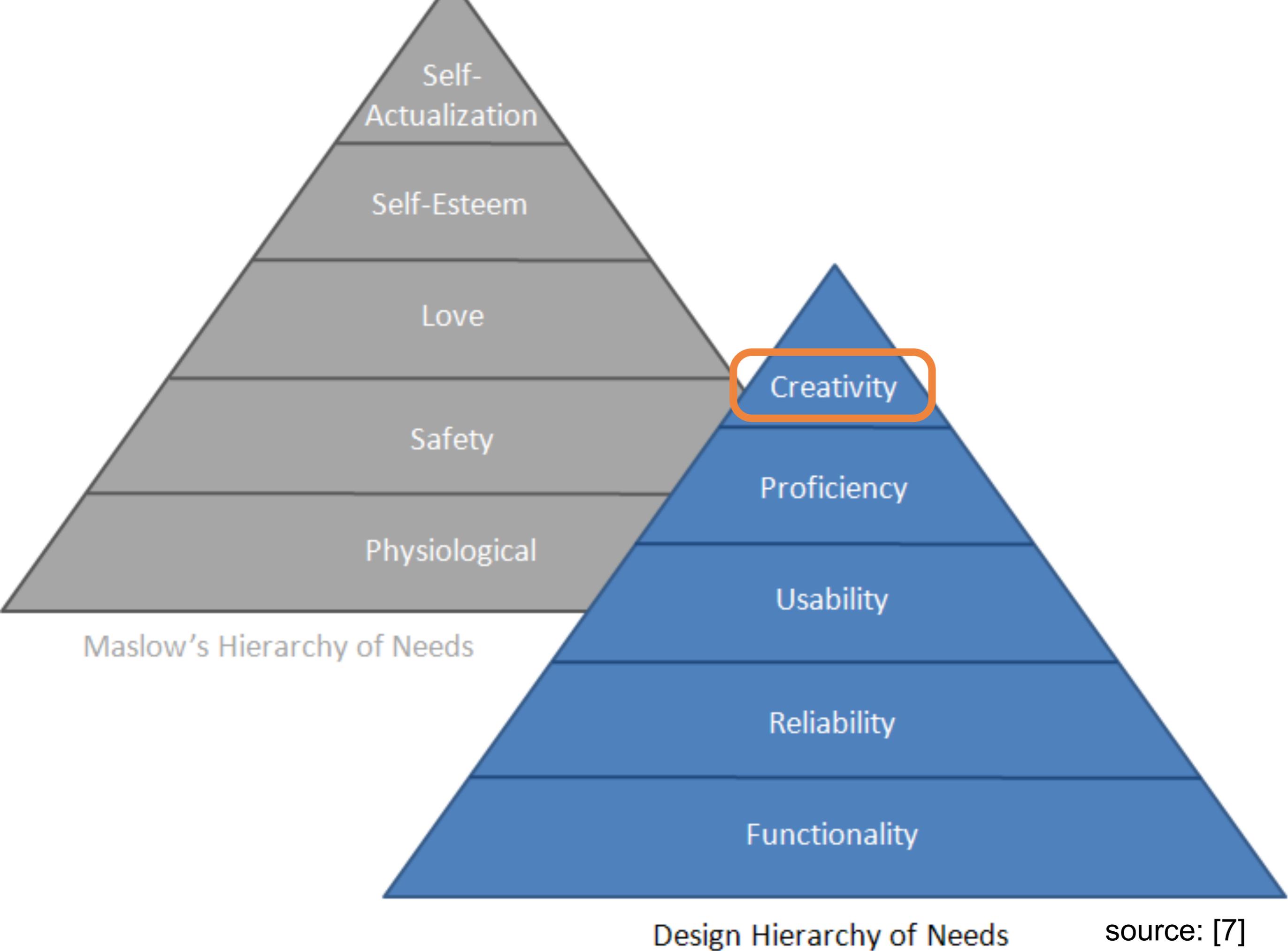


Design Hierarchy of Needs

source: [7]

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

For example, a HDD 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.



Maslow's Hierarchy of Needs

Design Hierarchy of Needs

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

source: [7]



## Aesthetic-Usability Effect

Aesthetic designs are perceived as easier to use than less-aesthetic designs.

Aesthetic designs look easier to use and have a higher probability of being used, whether or not they actually are easier to use.

source: [7]



# Flexibility-Usability Tradeoff

source: [7]

The **flexibility-usability tradeoff** is exemplified in the well known maxim “jack of all trades, master of none”. Flexible designs can perform more functions than specialised designs, but they perform the functions less efficiently.

source: [7]

Flexibility



# Flexibility-Usability Tradeoff

source: [7]

Usability



# Navigation

SANITÄRKERAMIK u. ZUBEHÖR

WC-SITZE / ARMATUREN

4

HANDWERKZEUG / DRAHT

FAHRRAD-u. AUTOZUBEHÖR / ÖLE

LÜFTUNG / SANITÄR

BAD - u. HEIZUNGSZUBEHÖR

5

DÜBEL / SCHRAUBEN / NÄGEL

REGALZUBEHÖR

FLIESENKLEBER / FUGENMÖRTEL

SILIKONE / REINIGUNG

6

LÖTEN / SCHWEISSEN

BESCHLÄGE / KETTEN / SEILE

MÖRTEL / BEDACHUNG

7

ELEKTRO / TAPETEN

DACHRINNE / PANEELE

LAMINAT

8

LEUCHTMITTEL / KLEBEFOLIEN

LAMPEN

9

KLEBSTOFFE

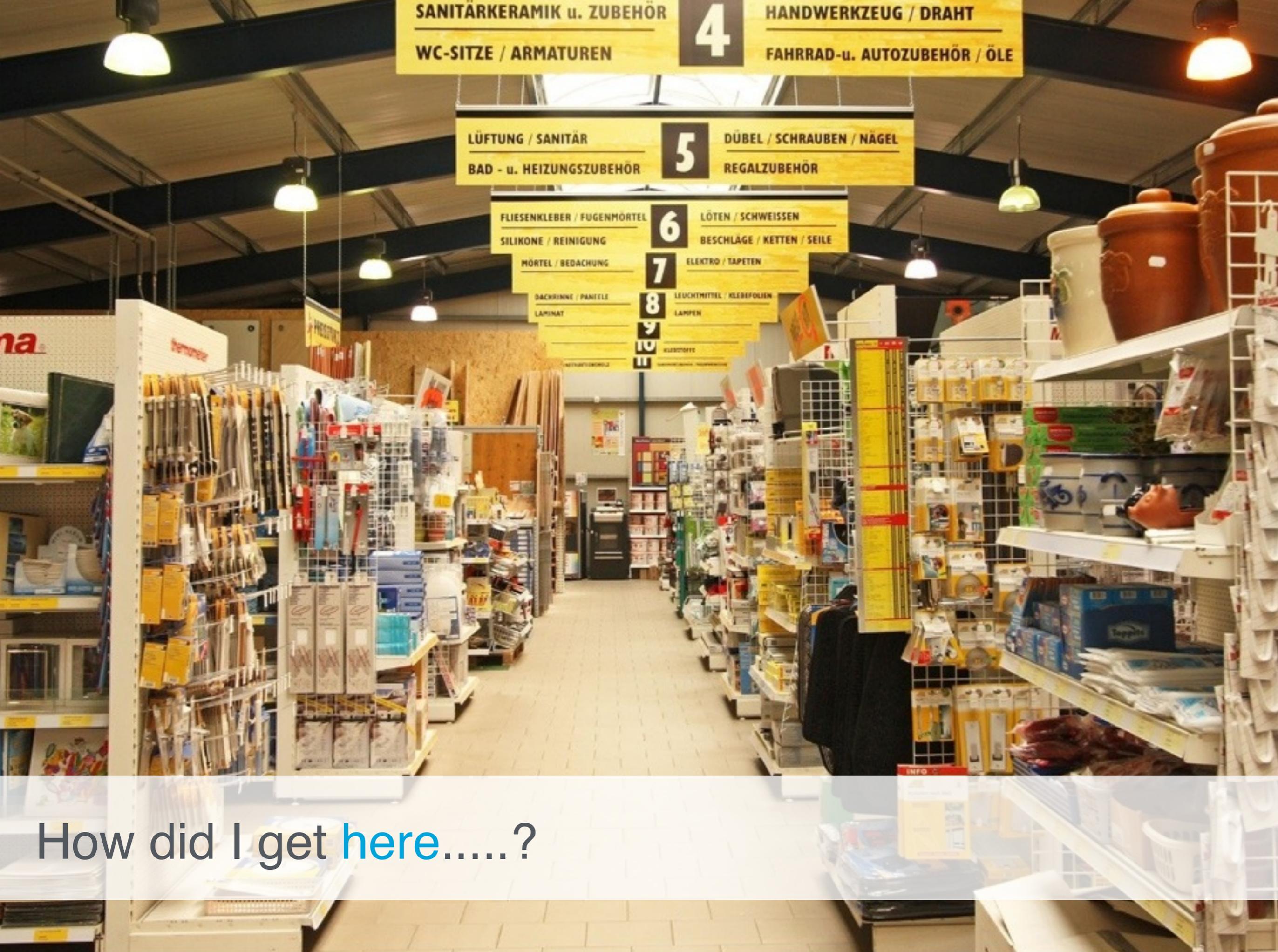
10

KLIMATISIERUNG

11

HEIZUNGSANLAGEN

Navigation



SANITÄRKERAMIK u. ZUBEHÖR  
WC-SITZE / ARMATUREN

4

HANDWERKZEUG / DRAHT  
FAHRRAD-u. AUTOZUBEHÖR / ÖLE

LÜFTUNG / SANITÄR  
BAD - u. HEIZUNGSZUBEHÖR

5

DÜBEL / SCHRAUBEN / NÄGEL  
REGALZUBEHÖR

FLIESENKLEBER / FUGENMÖRTEL  
SILIKONE / REINIGUNG

6

LÖTEN / SCHWEISSEN  
BESCHLÄGE / KETTEN / SEILE

MÖRTEL / BEDACHUNG

7

ELEKTRO / TAPETEN

DACHRINNE / PANELE  
LAMINAT

8

LEUCHTMITTEL / KLEBEFOLIEN  
LAMPEN

9

KLEBSTOFFE

How did I get **here**.....?





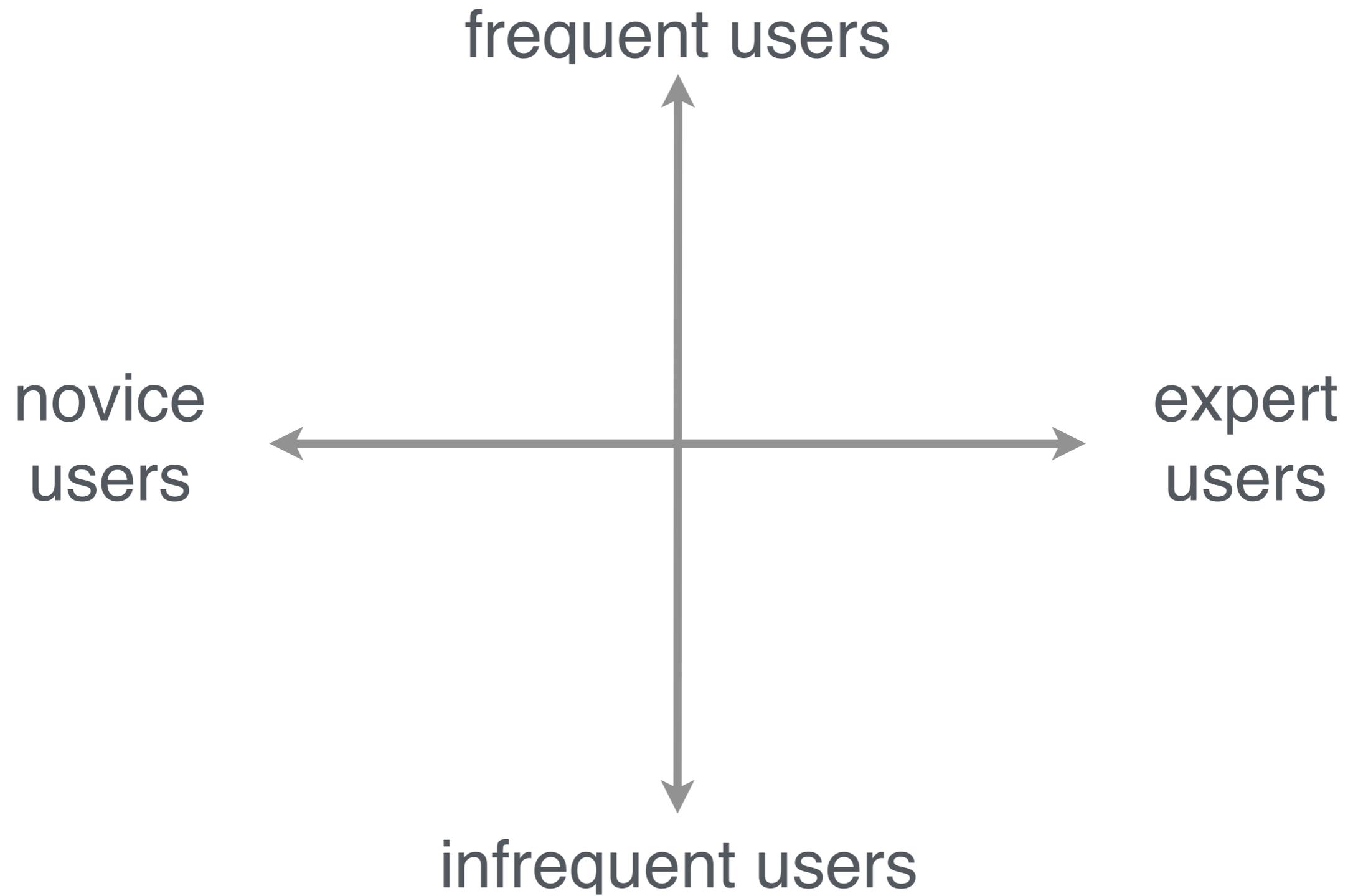
# iPhone 6

[http://cdn3.pcadvisor.co.uk/cmsdata/reviews/3572846/iPhone\\_6\\_PLUS\\_preview\\_MG\\_1875.jpg](http://cdn3.pcadvisor.co.uk/cmsdata/reviews/3572846/iPhone_6_PLUS_preview_MG_1875.jpg)

Navigation gives us something “to hold on”

It tells us what we´ll find and  
establishes a level of trust between the user  
and the people who build the system

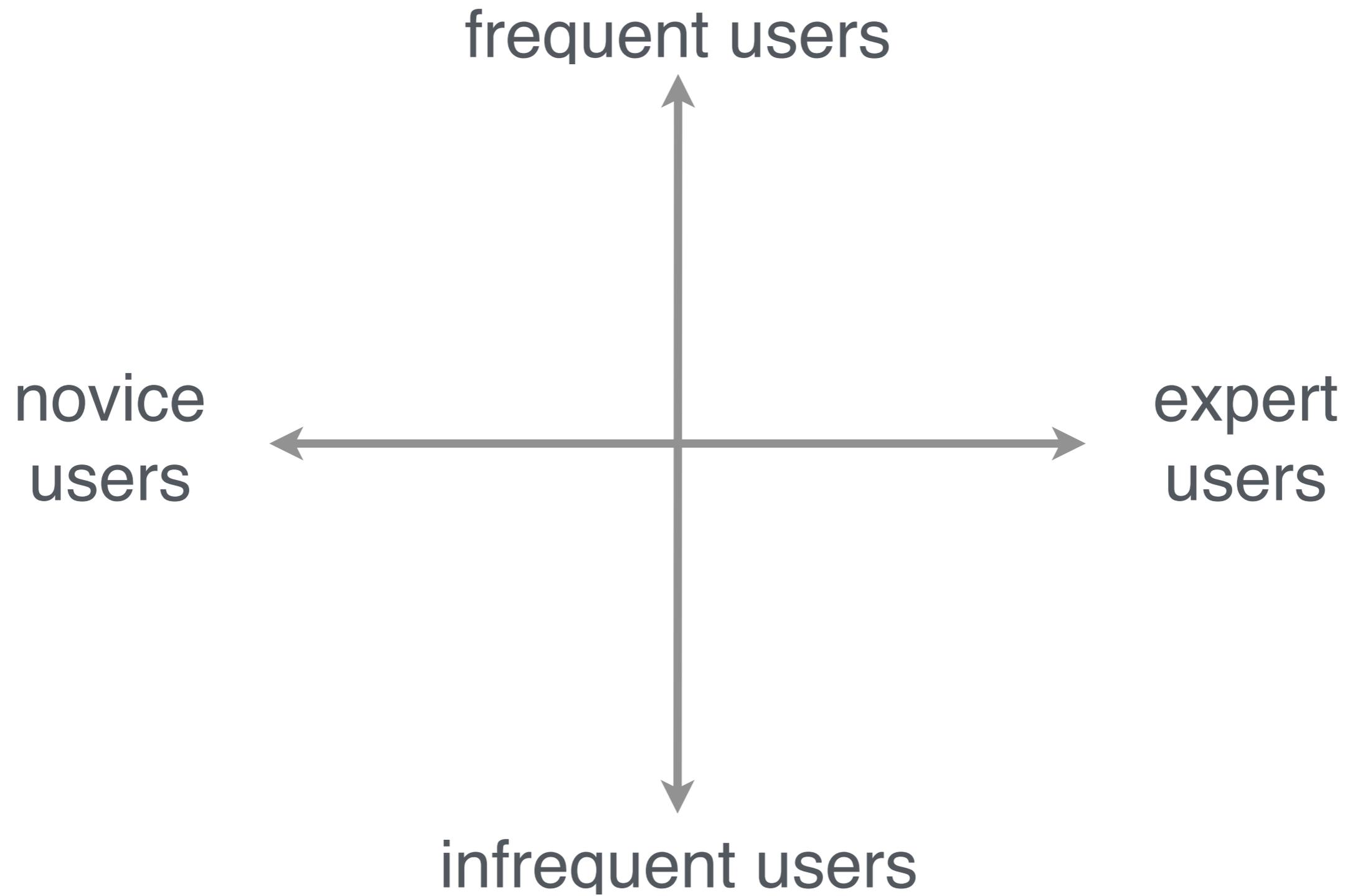
# USABILITY IN EVERYDAY LIFE!





# Audi A4 Series Cockpit

<http://www.audicomparisons.com/wp-content/uploads/2013/10/2014-Audi-A4-interior.jpg>





# Audi R15 Racing Cockpit

[http://2.bp.blogspot.com/\\_SM9A\\_sqVGgM/S9XON6I\\_WtI/AAAAAAAAADww/HcrQgfpuHgl/s1600/Audi+R15+Plus+Cockpit.jpg](http://2.bp.blogspot.com/_SM9A_sqVGgM/S9XON6I_WtI/AAAAAAAAADww/HcrQgfpuHgl/s1600/Audi+R15+Plus+Cockpit.jpg)

It is relatively easy to design for the perfect cases, when everything goes right, or when all the information required is available in proper format.

**Don Norman**

- Heuristic evaluation
- Heuristic estimation
- Cognitive walkthrough
- Pluralistic walkthrough
- Feature inspection
- Consistency inspection
- Standards inspection
- Formal usability

- **Heuristic evaluation**
- Heuristic estimation
- Cognitive walkthrough
- Pluralistic walkthrough
- Feature inspection
- Consistency inspection
- Standards inspection
- Formal usability



# Jakob Nielsen (NN Group)

[https://s3.amazonaws.com/media.nngroup.com/media/people/high-res-photos/jakob\\_mouse\\_big.jpg](https://s3.amazonaws.com/media.nngroup.com/media/people/high-res-photos/jakob_mouse_big.jpg)



# Usability Lab @ Sun Microsystems

[https://c1.staticflickr.com/1/230/489963693\\_22221f92f1\\_b.jpg](https://c1.staticflickr.com/1/230/489963693_22221f92f1_b.jpg)

**Heuristic (hyü-'ris-tik)** is a method to help solve a problem, commonly an informal method. It is particularly used to rapidly come to a solution that is reasonably close to the best possible answer, or 'optimal solution'.

## Visibility of system status

Match between system and the real world

User control and freedom

Consistency and standards

Error prevention

Recognition rather than recall

Flexibility and efficiency of use

Aesthetic and minimalist design

Help users recognize, diagnose,  
and recover from errors

Help and documentation

Upload the file or [Cancel](#)



Basecamp

picnik



Fluffing clouds....

Picnik



Your password has been emailed.

Theresa Neil sign in

Tick

Quelle: [3,7]

Visibility of system status

Match between system and the real world

User control and freedom

Consistency and standards

Error prevention

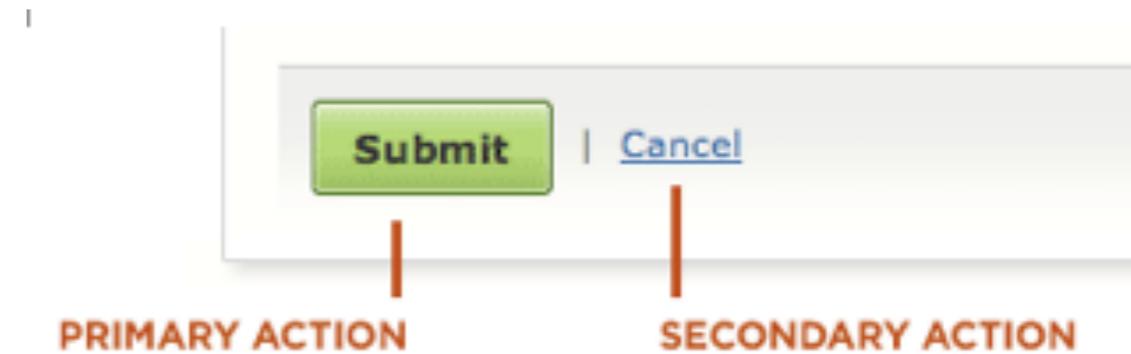
Recognition rather than recall

Flexibility and efficiency of use

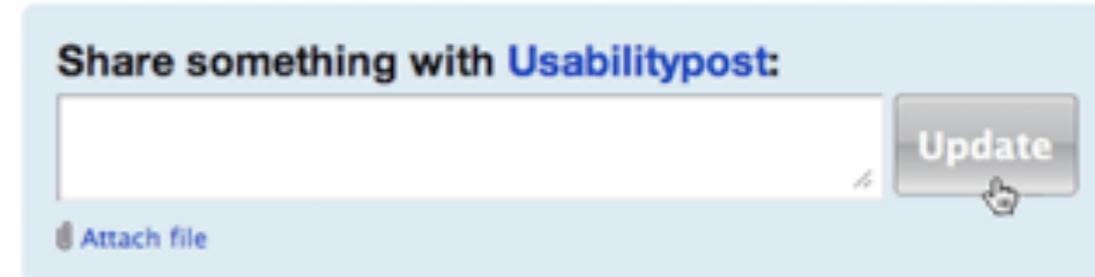
Aesthetic and minimalist design

Help users recognize, diagnose,  
and recover from errors

Help and documentation



Example: "Web Design, Filling the Blanks"



Yammer

Quelle: [3,7]

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Help and documentation

## Common Shortcuts

Add Action	Return
New Window	⌘N
Synchronize with Server	⌘S
Clean Up	⌘K
Planning Mode	⌘1
Context Mode	⌘2
Inbox	⌘1
Quick Entry	⌘Space

*Quick Entry's shortcut can be customized in Preferences*

## Omnifocus

Show All Bookmarks	⌘B
Add Bookmark to Menu	⌘D
Add Bookmark For These Tabs...	
Add Bookmark Folder	⌘N

Bookmarks Bar ▶

Mac OSX 10.5

(Accelerators)

Quelle: [3,7]

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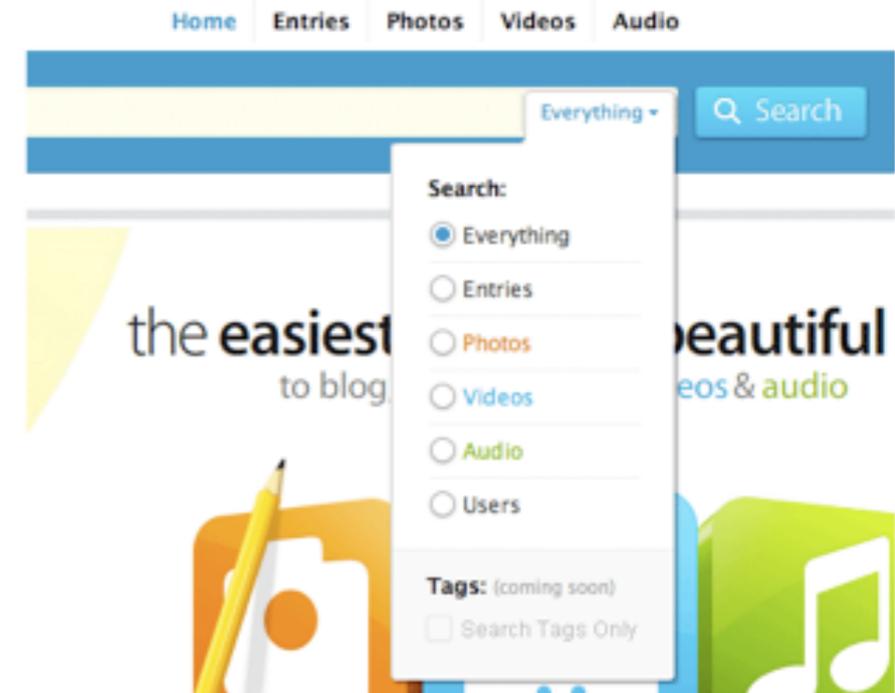
Recognition rather than recall

Flexibility and efficiency of use

Aesthetic and minimalist design

Help users recognize, diagnose,  
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Help and documentation



Kontain



Visibility of system status

Match between system and the real world

User control and freedom

Consistency and standards

Error prevention

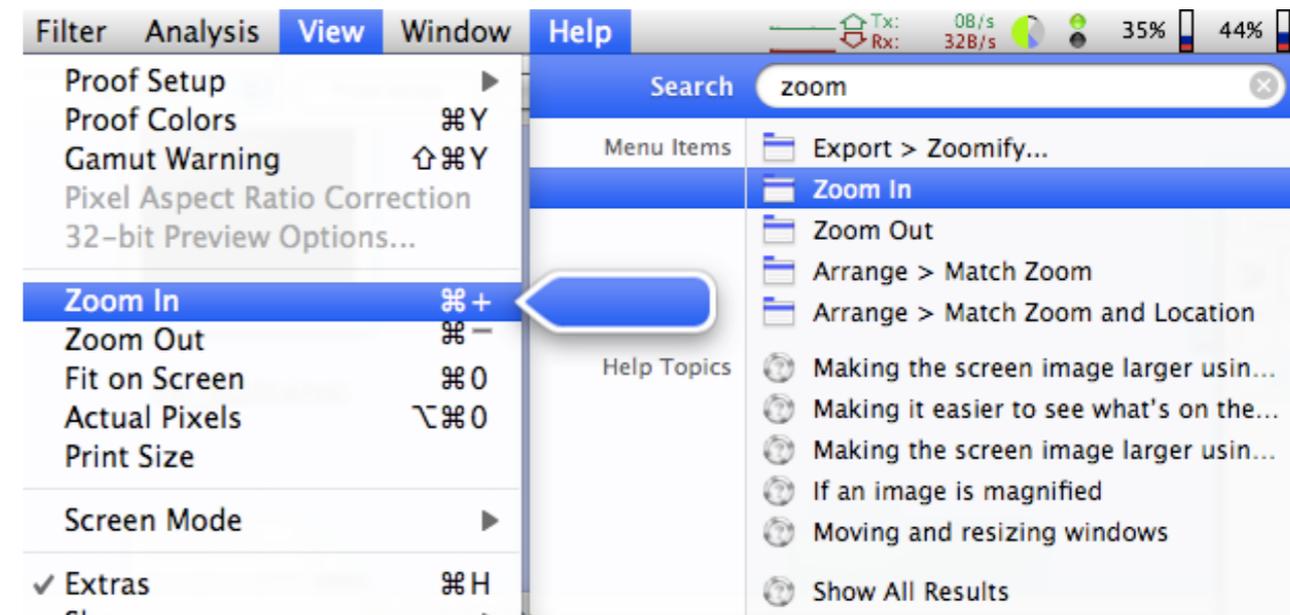
Recognition rather than recall

Flexibility and efficiency of use

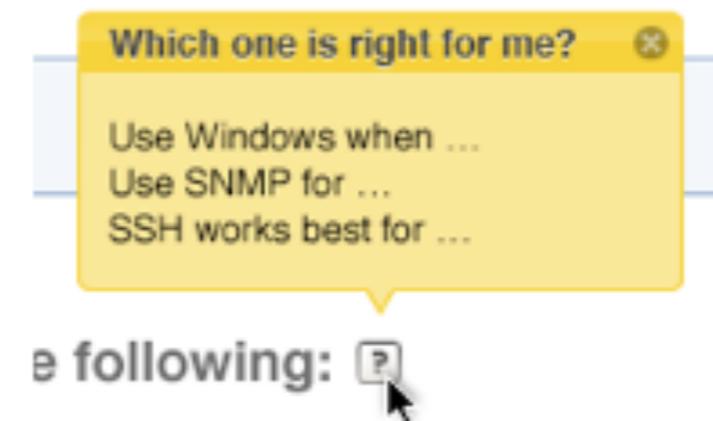
Aesthetic and minimalist design

Help users recognize, diagnose,  
and recover from errors

Help and documentation



Mac OS X 10.5 (Screenshot)



Zenoss

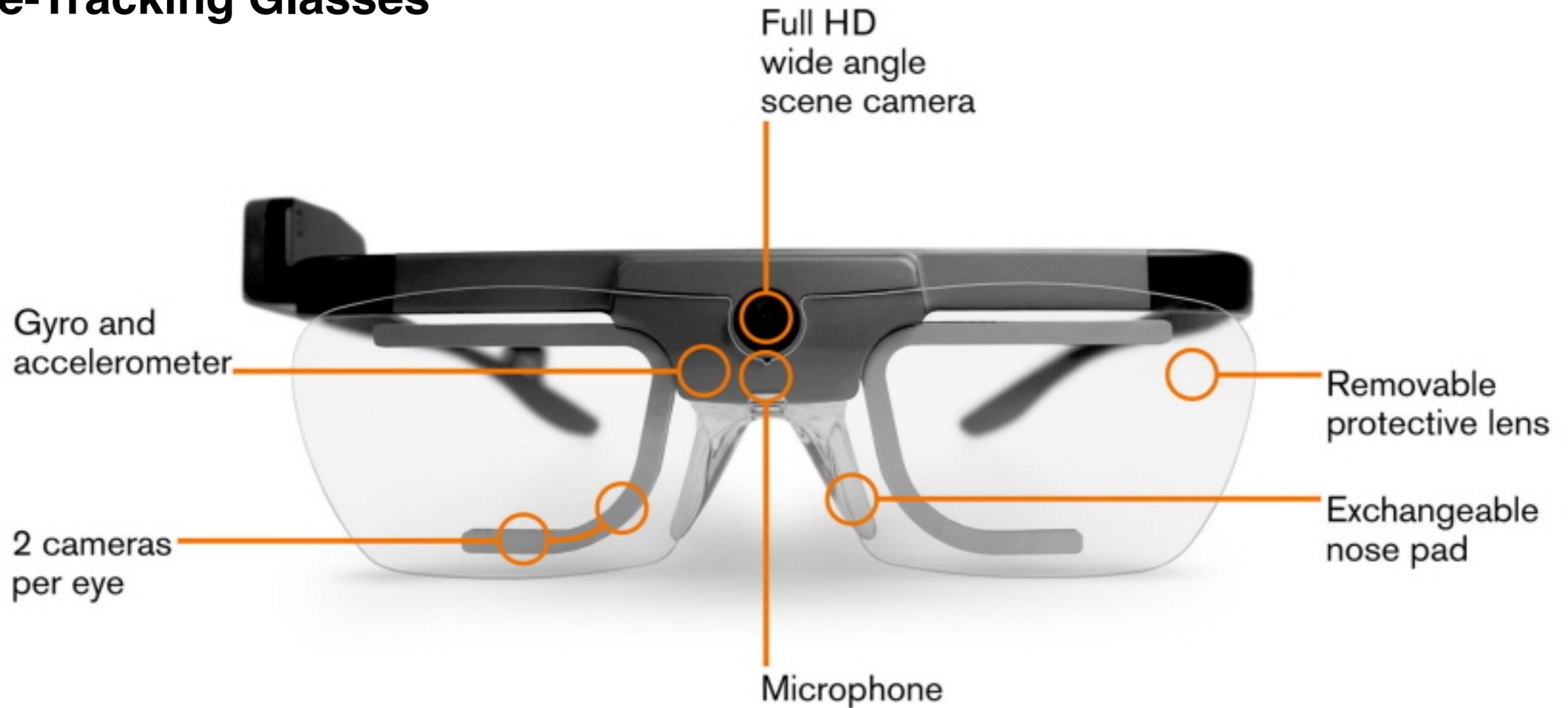
Quelle: [3,7]

# USABILITY Testing Applied

# Mobile Usability Lab



# Eye-Tracking Glasses



## Usability Testing in the Field



## Usability Testing in the Field



Video Overview: Usability Testing in the Field



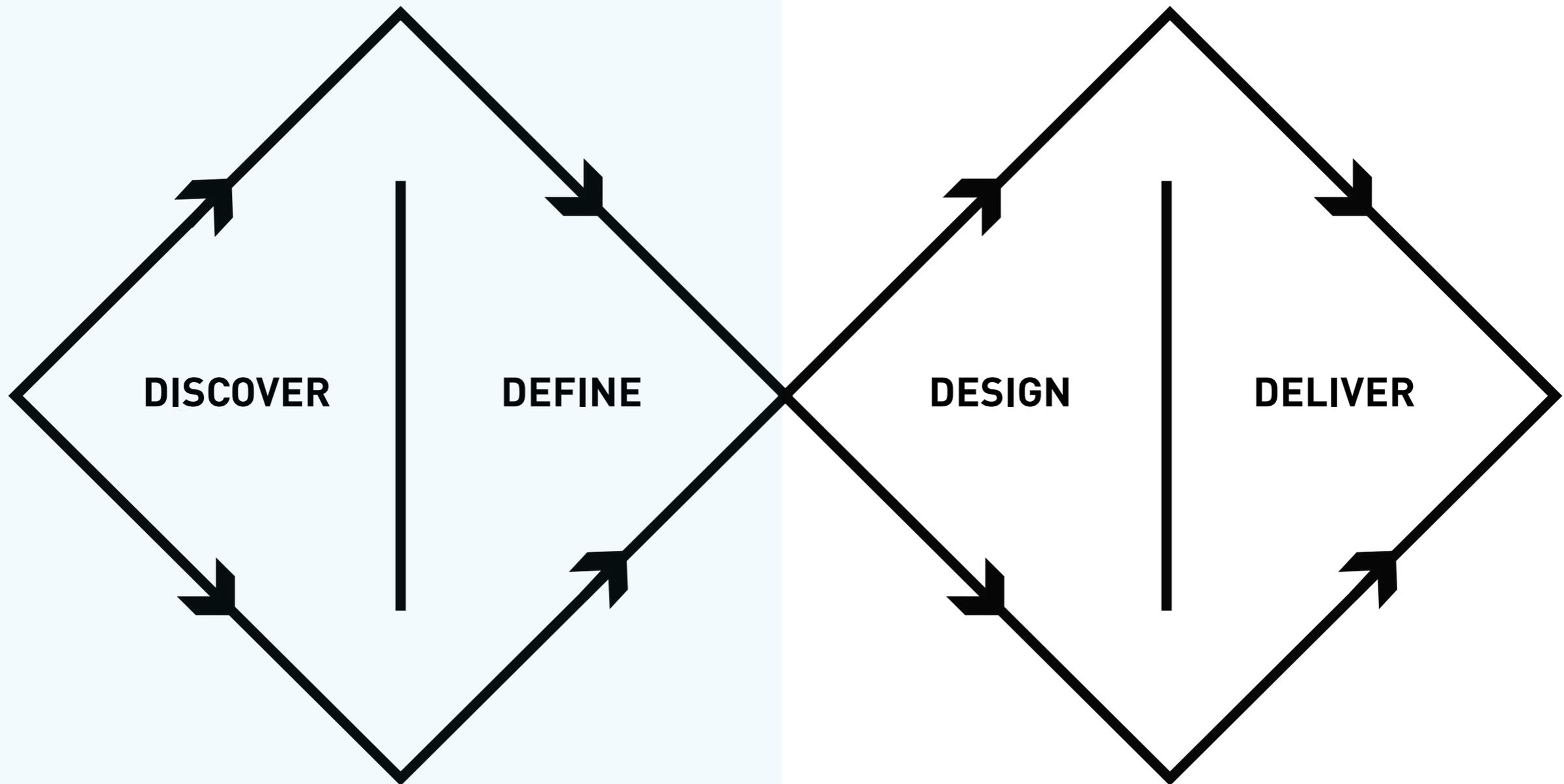
# Usability Testing

## Report contains:

- Study Design
- User Profiles
- Questionnaire Results
- Interview Quotes
- Summarised Findings
- Design Recommendations

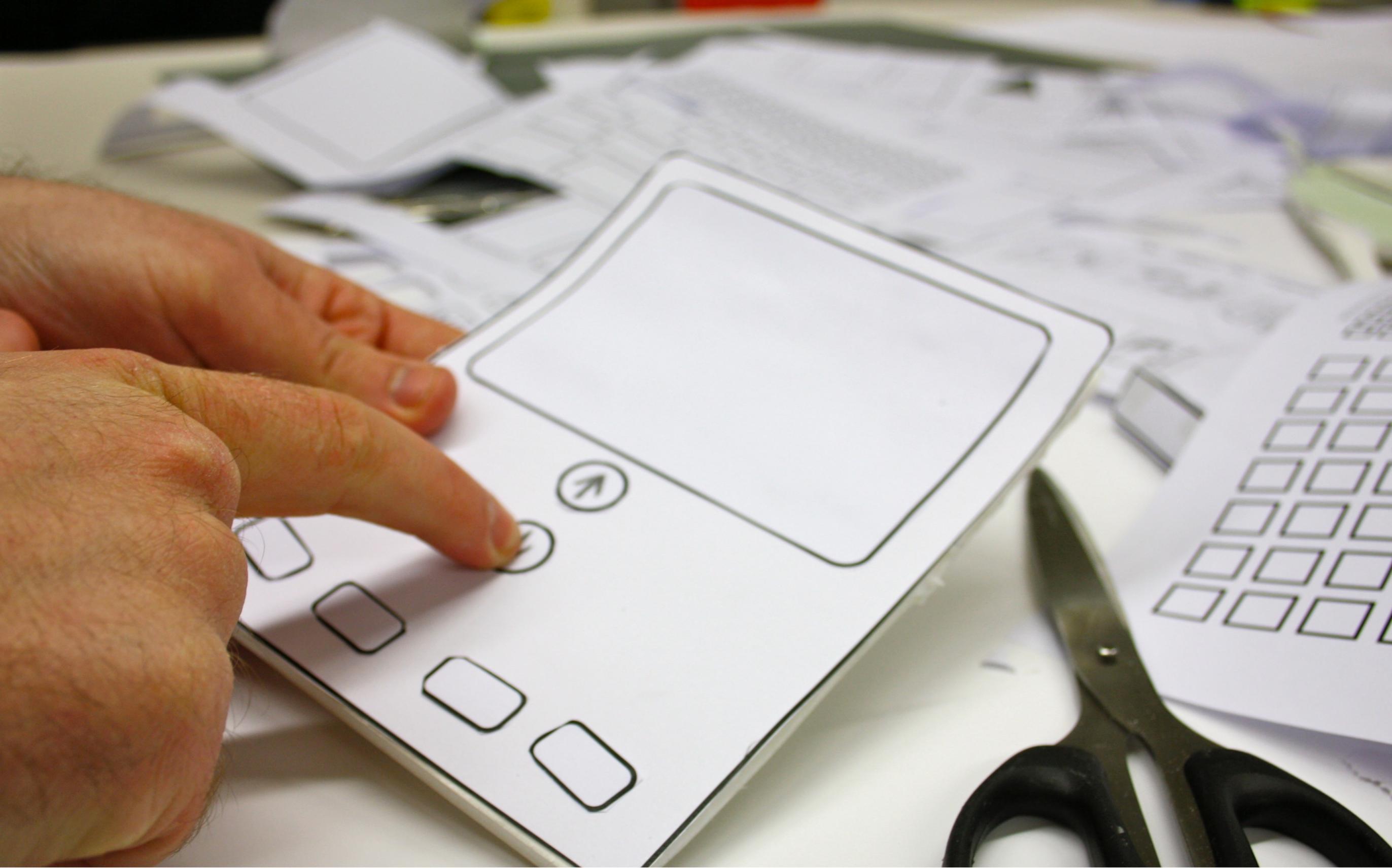


# Double Diamond



**Why? and How?**

source: [8]



# Paperprototyping & Wireframes

# 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

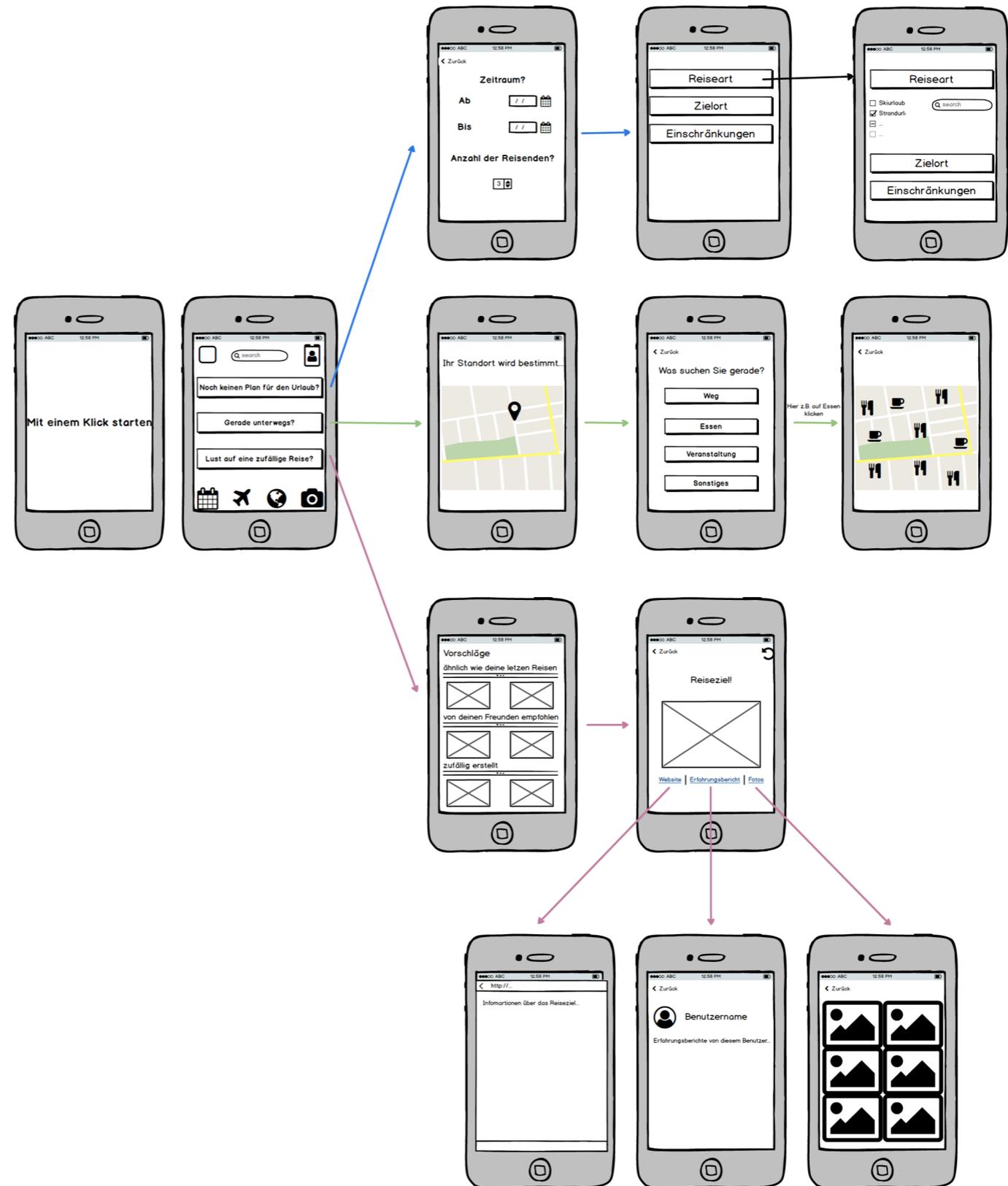
Paper prototyping started in the mid 1980s and then became popular in the mid 1990s when companies such as IBM, Honeywell, Microsoft, and others started using the technique in developing their products.



# WHAT IS PAPER PROTOTYPING



# Wireframes

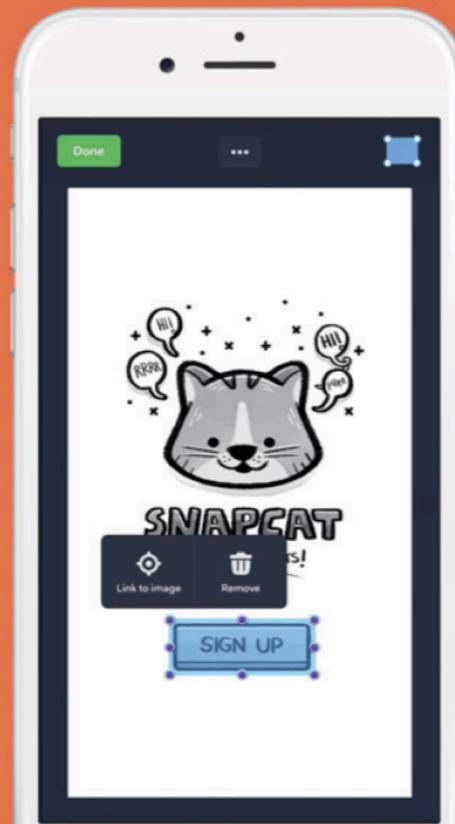


# ...USING THE POP-APP

Take photos of your sketches or design in the app



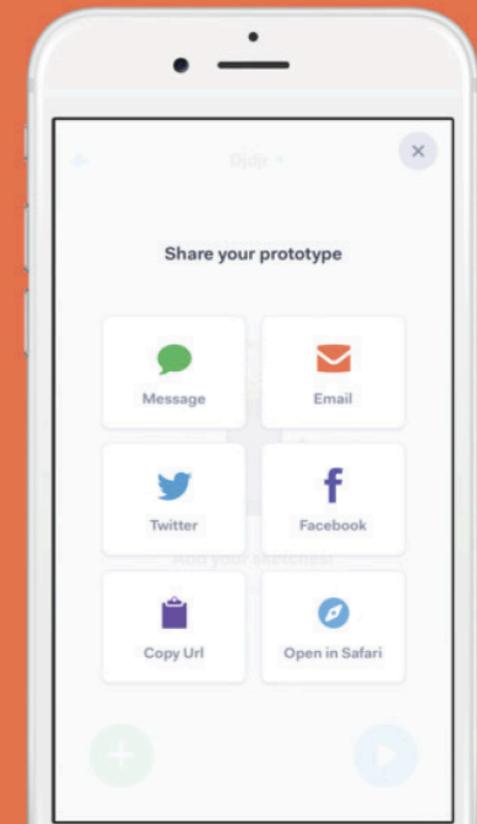
Link your screens together using hotspots



Play with your app idea or test it out on friends



Or share with others by using Facebook, Twitter, Email...



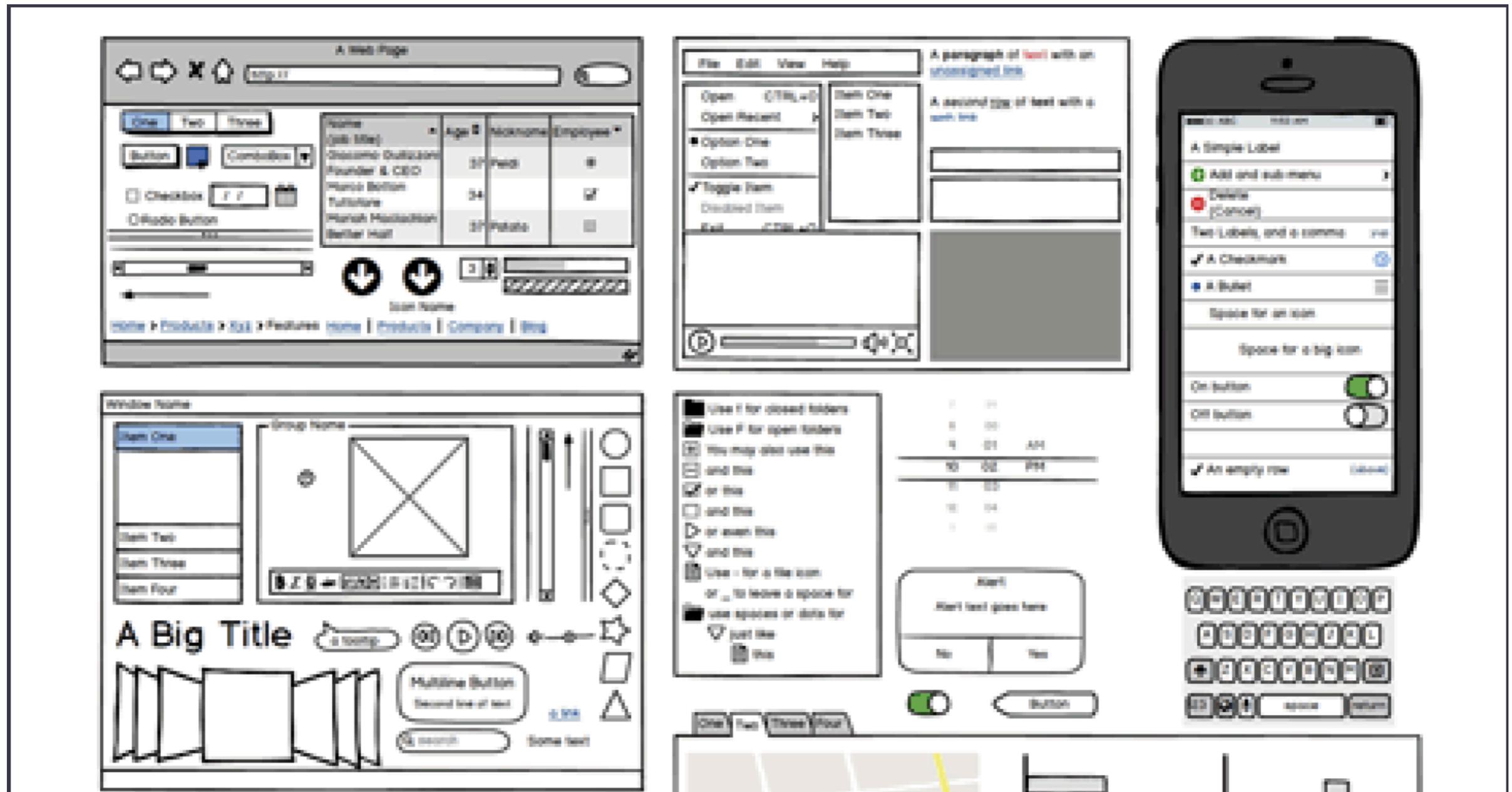


# PAPER PROTOTYPING

- choose from a wide range of interface modules
- import your sketched wireframes
- turn sketches into clickable prototypes

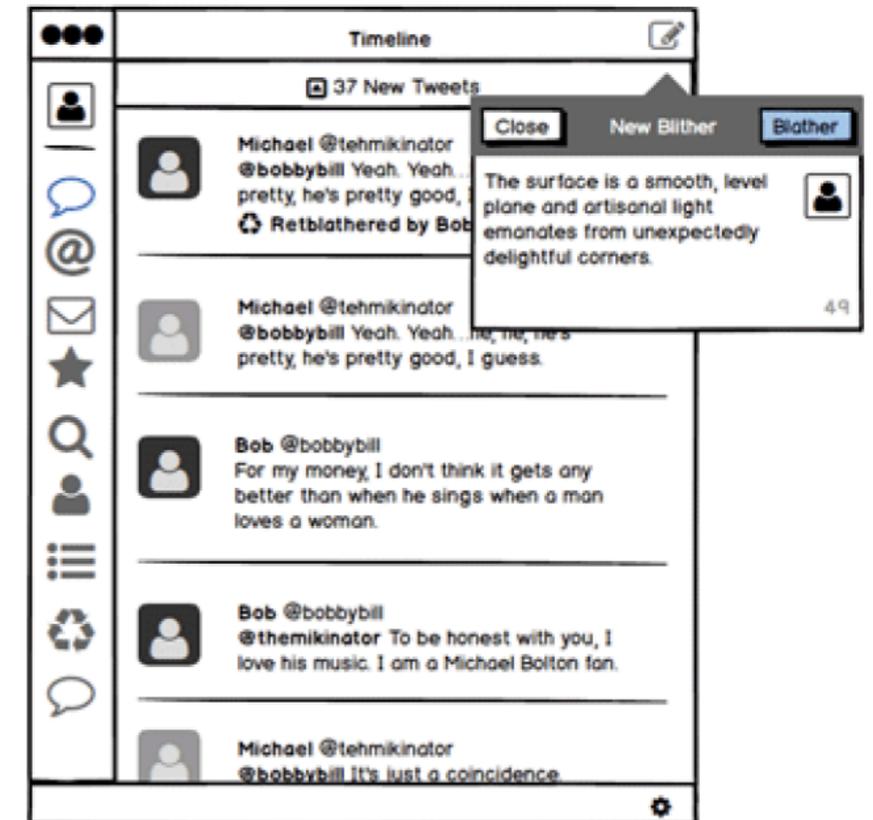
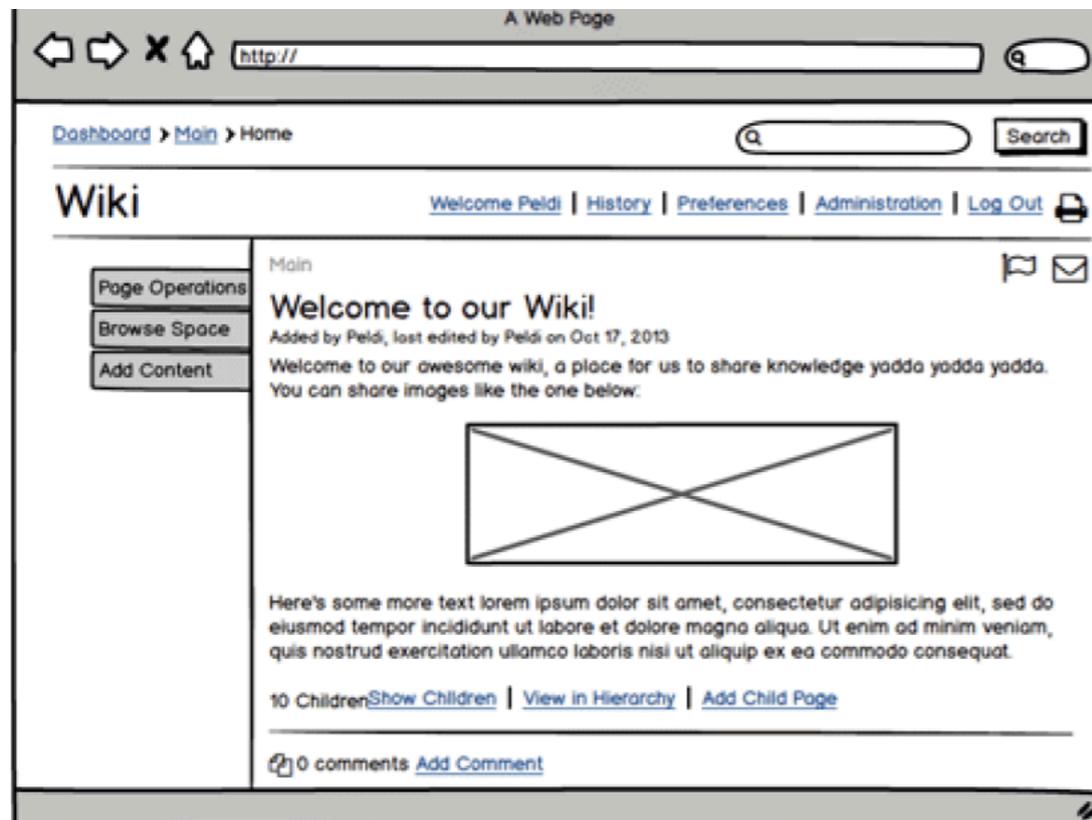


# PAPER PROTOTYPING BALSAMIQ



# PAPER PROTOTYPING BALSAMIQ

- choose from a wide range of interface modules
- create fast low fidelity clickable prototypes



# POP VS. BALSAMIQ

## POP

- + Use your own sketches
- + Fast and easy prototyping
- Limited UI elements

## BALSAMIQ

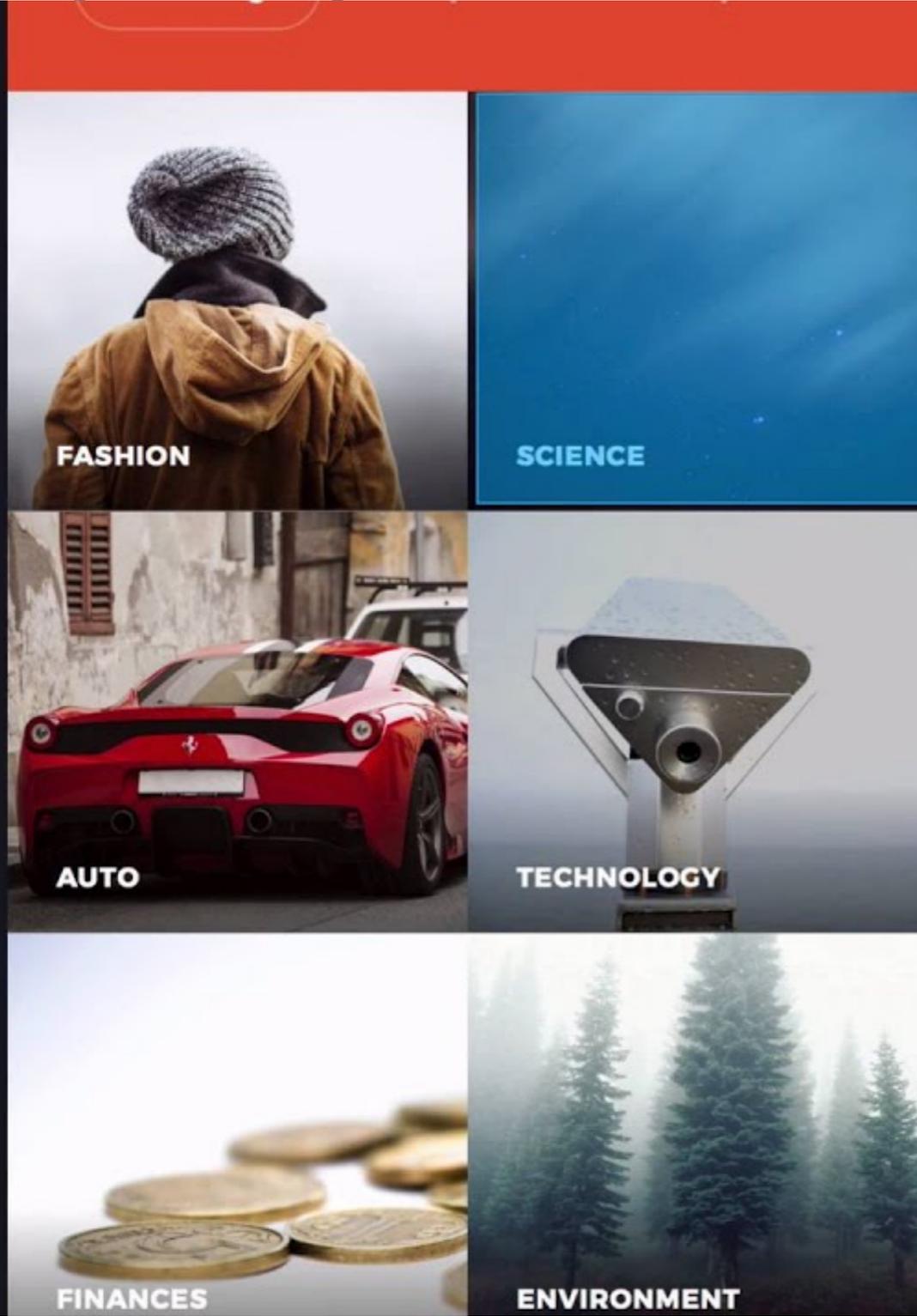
- + Create new mockups directly from the “Create New” menu
- + Simply click to edit wireframes
- + Sketch-based wireframes allow designers to focus on functionality
- + 30 days free trial
- Limited functionality

# Overview Sketch vs. Prototype

<b><i>Sketch</i></b>	<b>vs</b>	<b><i>Prototype</i></b>
Provocative		Didactic
Suggest		Describe
Explore		Refine
Question		Answer
Propose		Test
Provoke		Resolve
Tentative		Specific
Noncommittal		Depiction

# Overview UI Prototyping Tools

Prototyping Tools		Mockplus	Axure	Balsamiq	JustInmind	Sketch	Adobe XD (Preview)	Invision
Productivity	Learning Curve	Very Easy	Complex	Very Easy	Complex	Average	Average	Easy
	Integrated Efficiency	Fast	Average	Fast	Slow	Average	Average	Fast
	Interaction Design	Fast	Average	-	Average	Plug-in Required	Fast	-
	Build Widgets	Fast	Slow	Fast	Average	Slow	Slow	-
	Device Testing	Fast	Slow	-	Average	Plug-in Required	Average	Fast
Fidelity	Visual Fidelity	Average	Average	Low	High	High	High	High
	Interactive Fidelity	Average	High	-	High	High	High	Average
Professional Skill Requirement	Product Experience	Required	Required	Required	Required	-	-	Required
	Visual Design	-	-	-	Required	Required	Required	Required
	Programming Knowledge	-	Basic Knowledge	-	-	Basic Knowledge	-	-
Sharing		Average	Great	Average	Great	-	-	Great



Link To: ×

10-Channel ▼ Browse

Gesture: Double Tap ▼ Transition: Instant ▼

Maintain scroll position after click

Include hotspot in template

Save cancel delete

## References (Books):

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