UX Design Fundamentals

SoftUni Creative

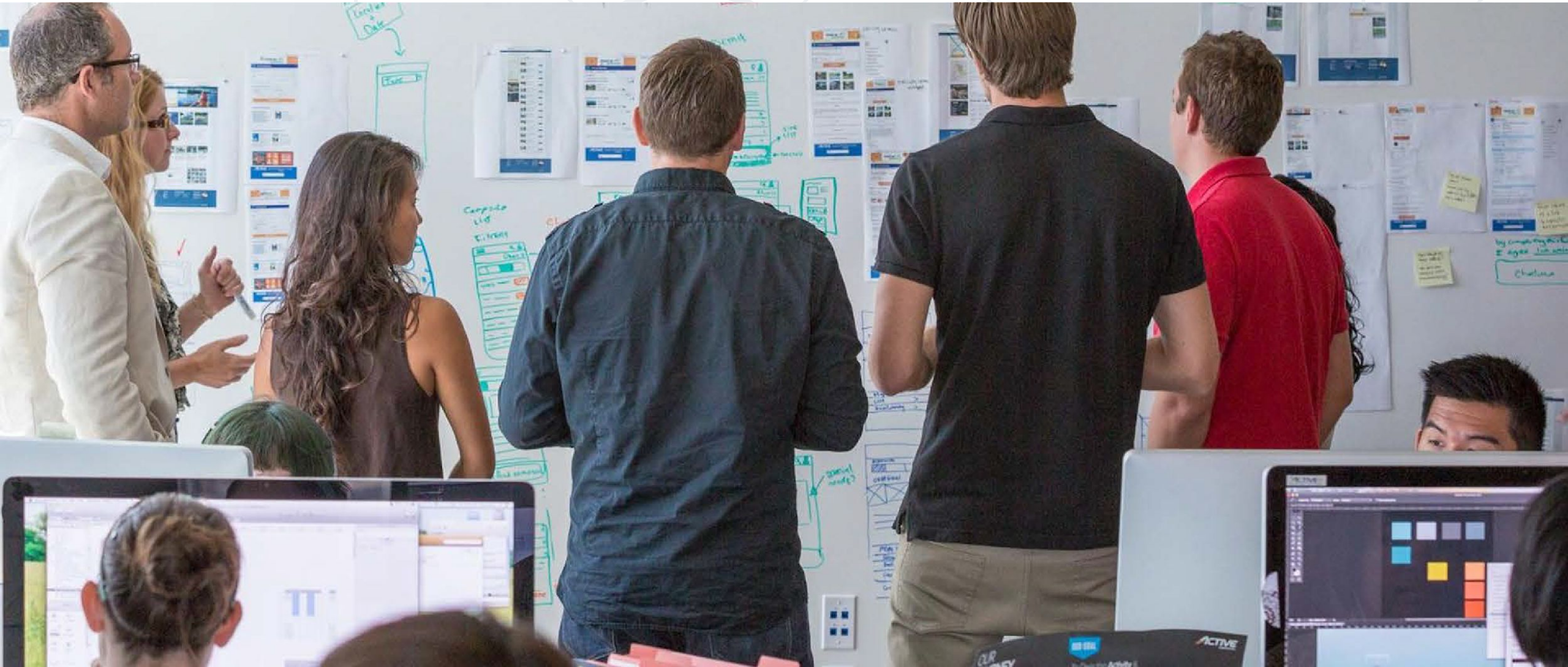
Infragistics

https://www.infragistics.com/

Content

- The human processor model
- Fitt's law
- Conceptual models
- Gestalt principles
- The seven stages of action
- Mappings, affordances and constraints
- Types of knowledge
- Errors and mistakes

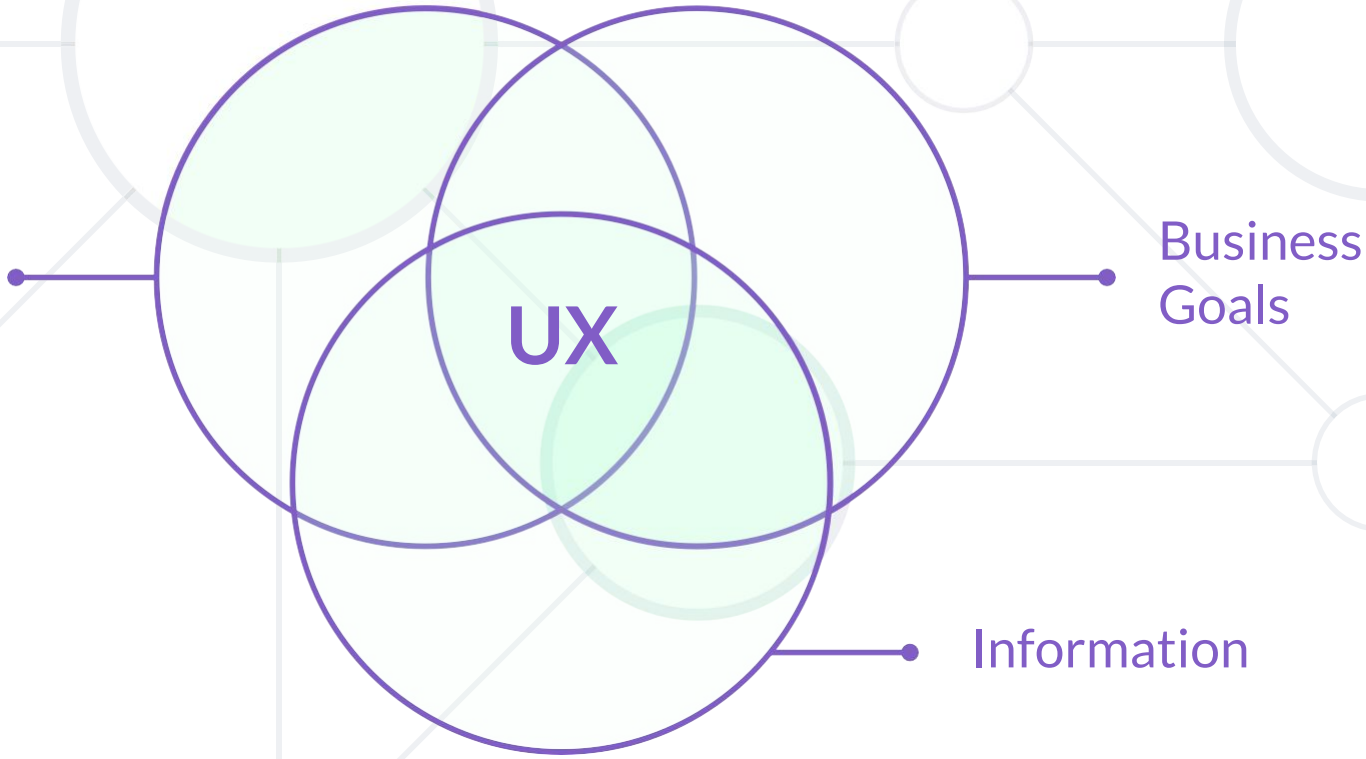
Why is it that some products stink? And why User Experience?



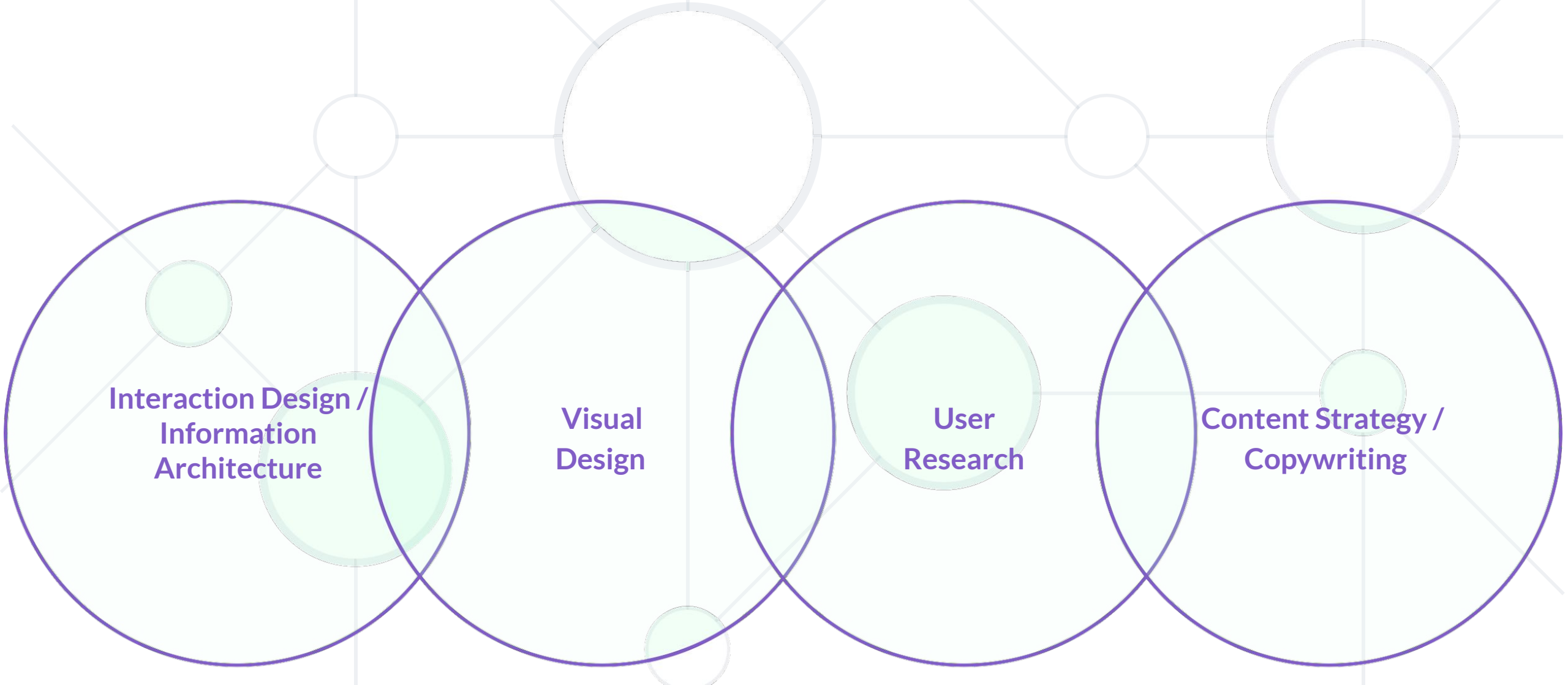
Here’s why…

- UX is a force for the good
- The world needs more of it
- We can make it happen

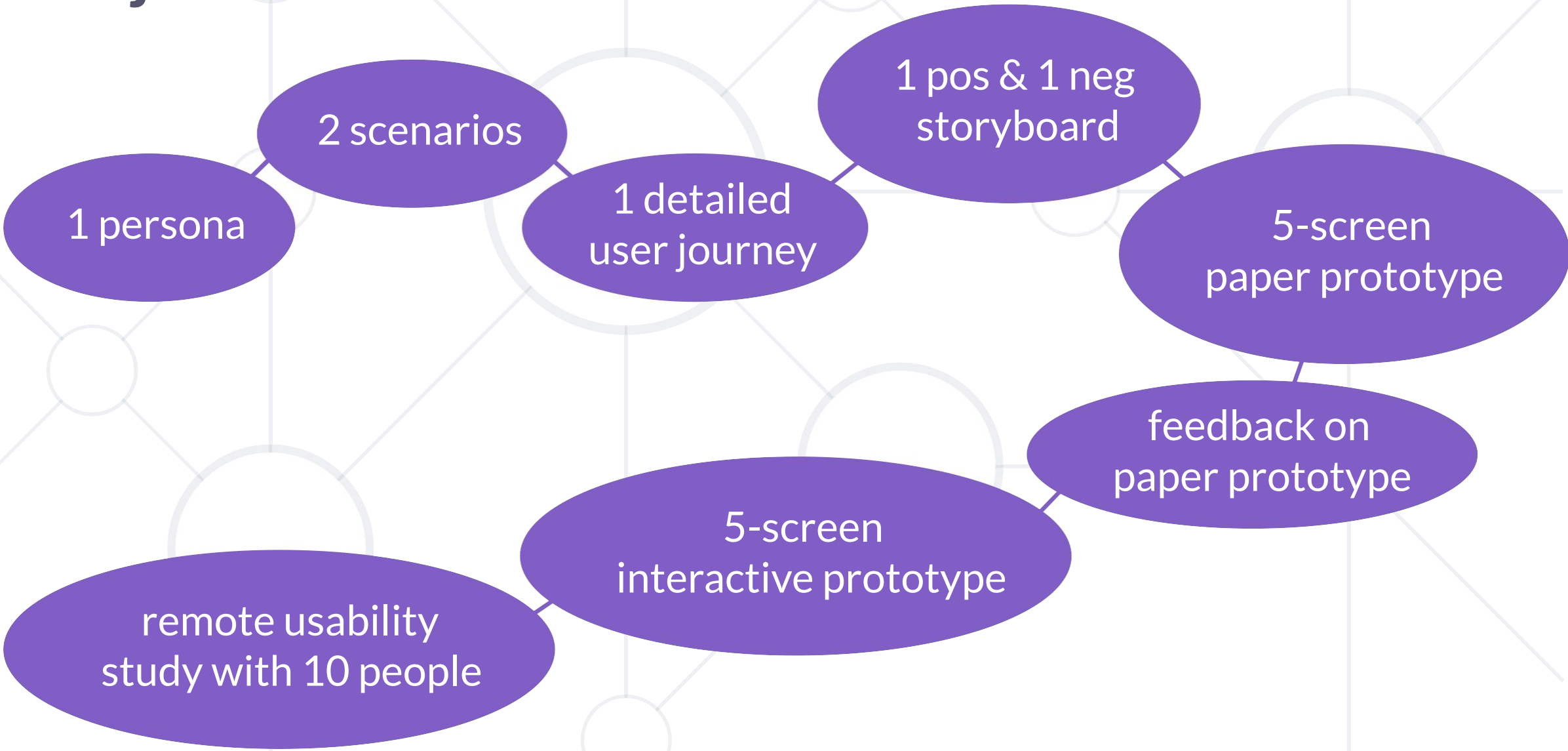
What is User Experience?



UX is a mix of several disciplines



Project Submission

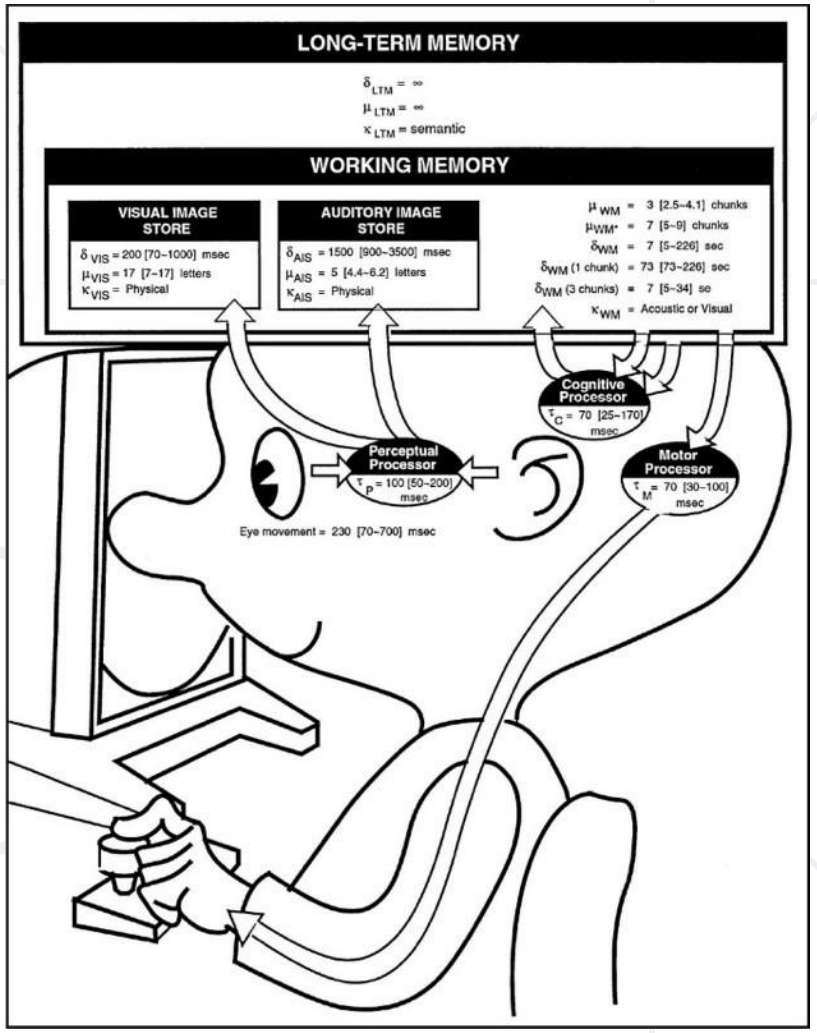


#UX-Design

The human processor model

- 80’s Card, Moran, Newell
- Coexistence of perception, memory, movement
- Reference for analyzing human input/output

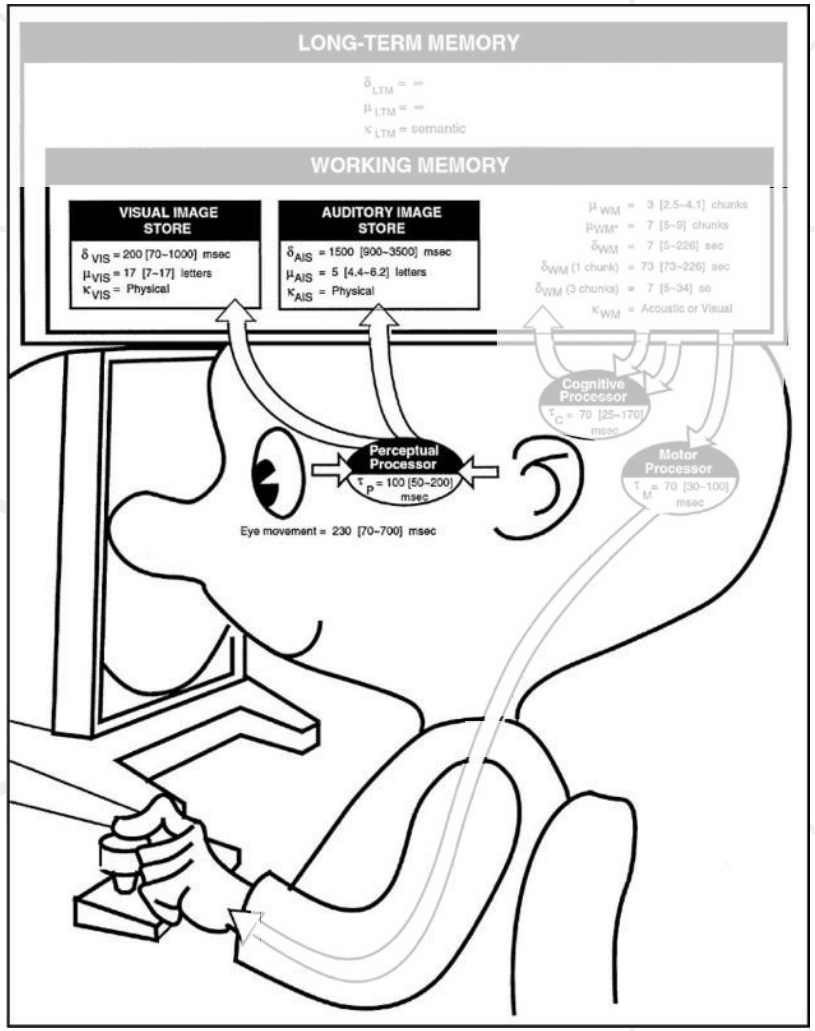
The human processor model



- Three processors and three types of memory
- Slow man, Middle man and Fast woman

Perceptual processor and memory

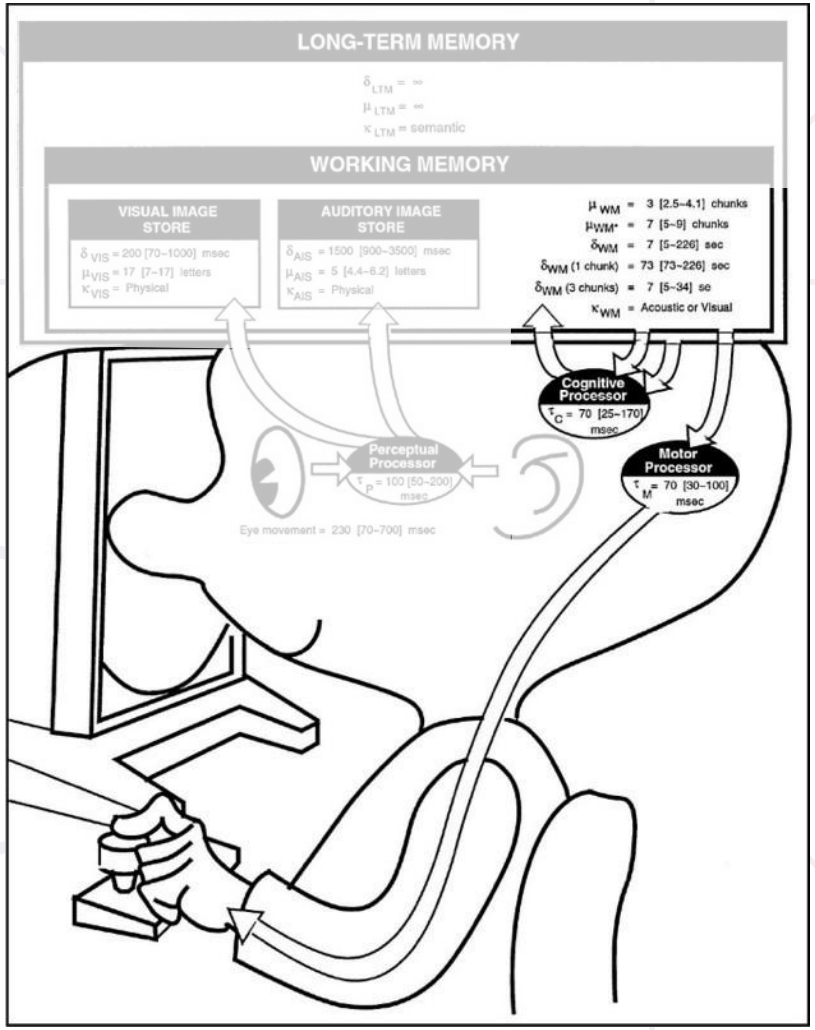
- Buffers for immediate storage and processing
- 100ms perception time
- Defines rate of 10 fps as absolute minimum
- Decreases with lesser light



Cognitive and motor processor and working memory

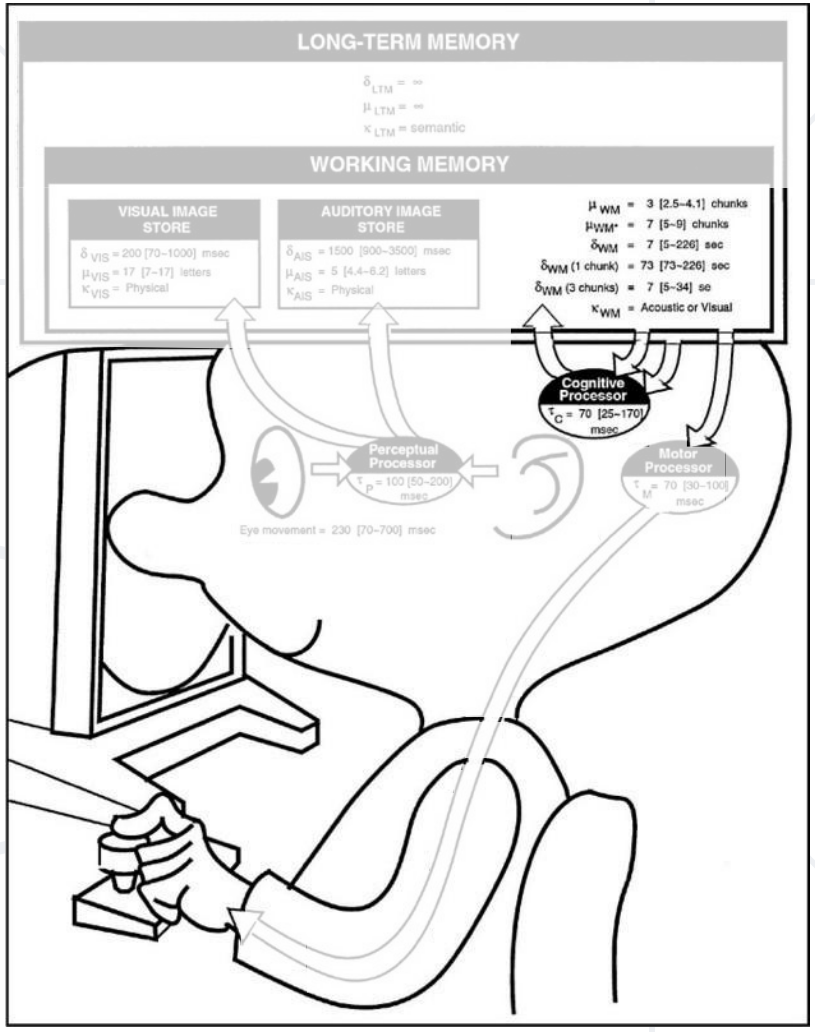
- Object recognition
- 70ms cognition time

- Drive for corrective action
- 70ms movement time



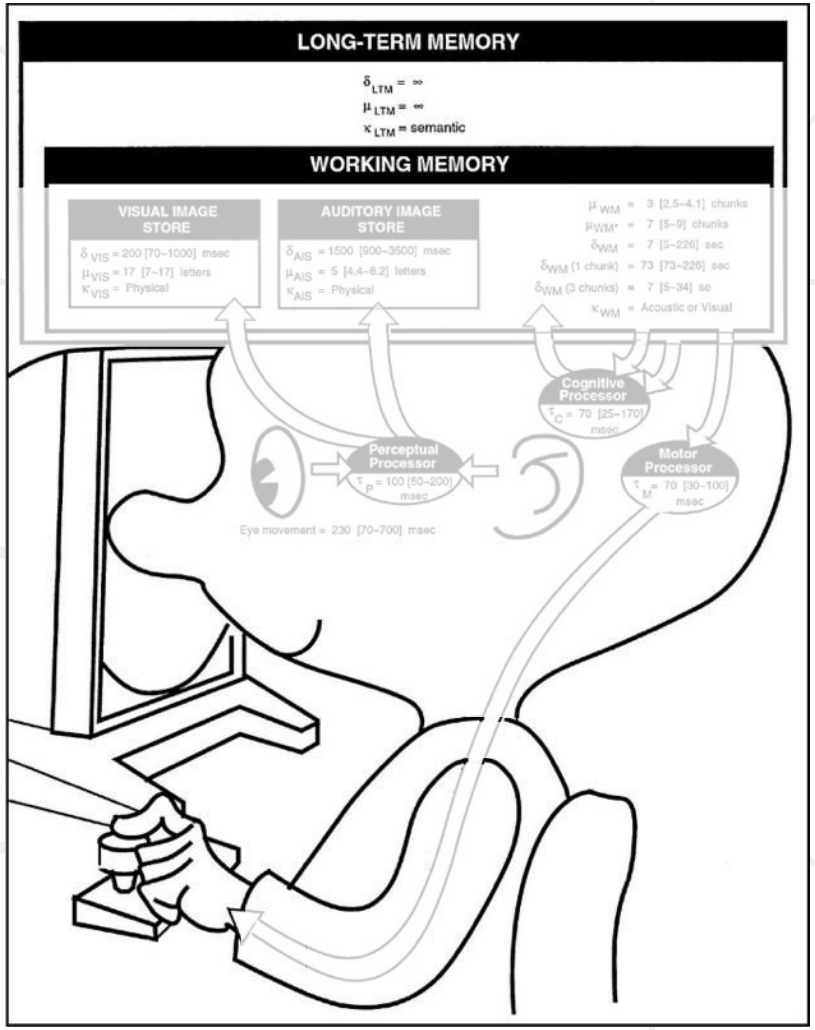
Cognitive and motor processor and working memory

- Miller’s number 7±2 cognitive items
- 73s to memorize one information unit
- 7s half life of the information
- Working memory is used for decoding visual and audial stimulus once perceived



Long-term memory

- Infinite capacity and half life
- Based on associations
- Slow to write but quick to access
- Optimal learning when 7s are available to memorize individual unit of information



Experiment

What is your car license plate?

Experiment

What is your car license plate?
Write down 5 numbers and read them out loud to your partner.
e.g. 32 48 75 38 95

Experiment

What is your car license plate?
Write down 5 numbers and read them out loud to your partner.
Then let him count from 50 to 1(in reverse).

Experiment

What is your car license plate?
Write down 5 numbers and read them out loud to your partner.
Then let him count from 50 to 1(in reverse).
Make him reproduce the 5 numbers.

Experiment

Now let’s do it together with 9 numbers that I am going to read out loud to you.

Experiment

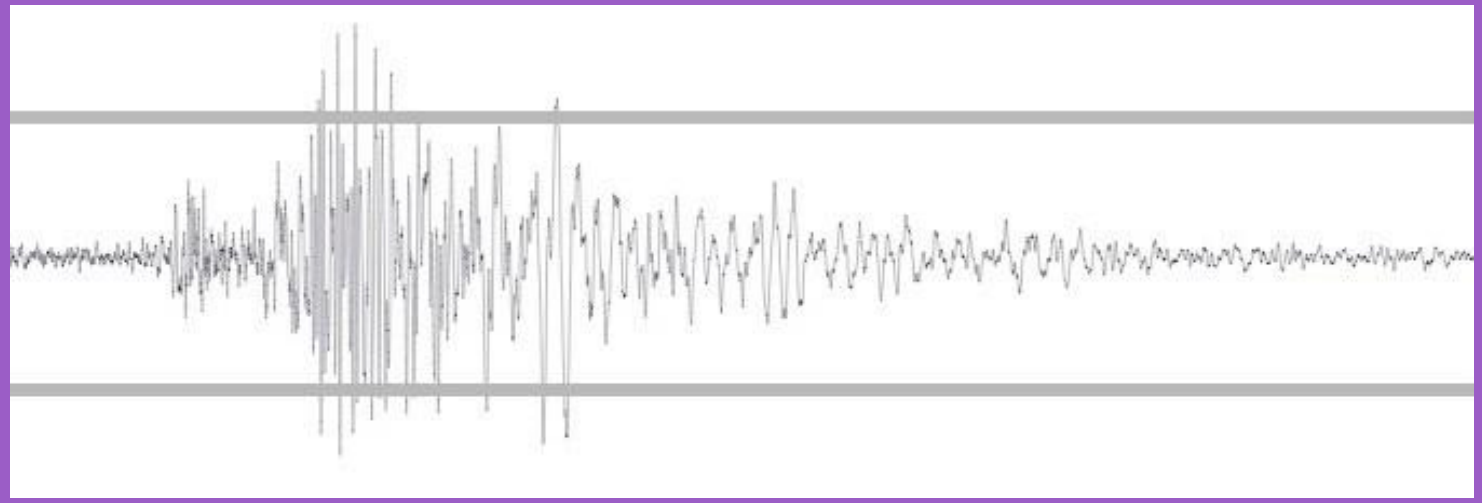
Count from 50 to 1(in reverse) and try to reproduce the 9 numbers.

Eye saccades

- 13 characters per movement
- 11 words per second

You may try this at home

100
70
70
- - - - - - -
240



Draw a zig zag line for 5 seconds between two parallel lines trying to end as close to the lines as possible.

Fitt's law

Prediction for the time necessary to press a button, based on the distance to it and its size

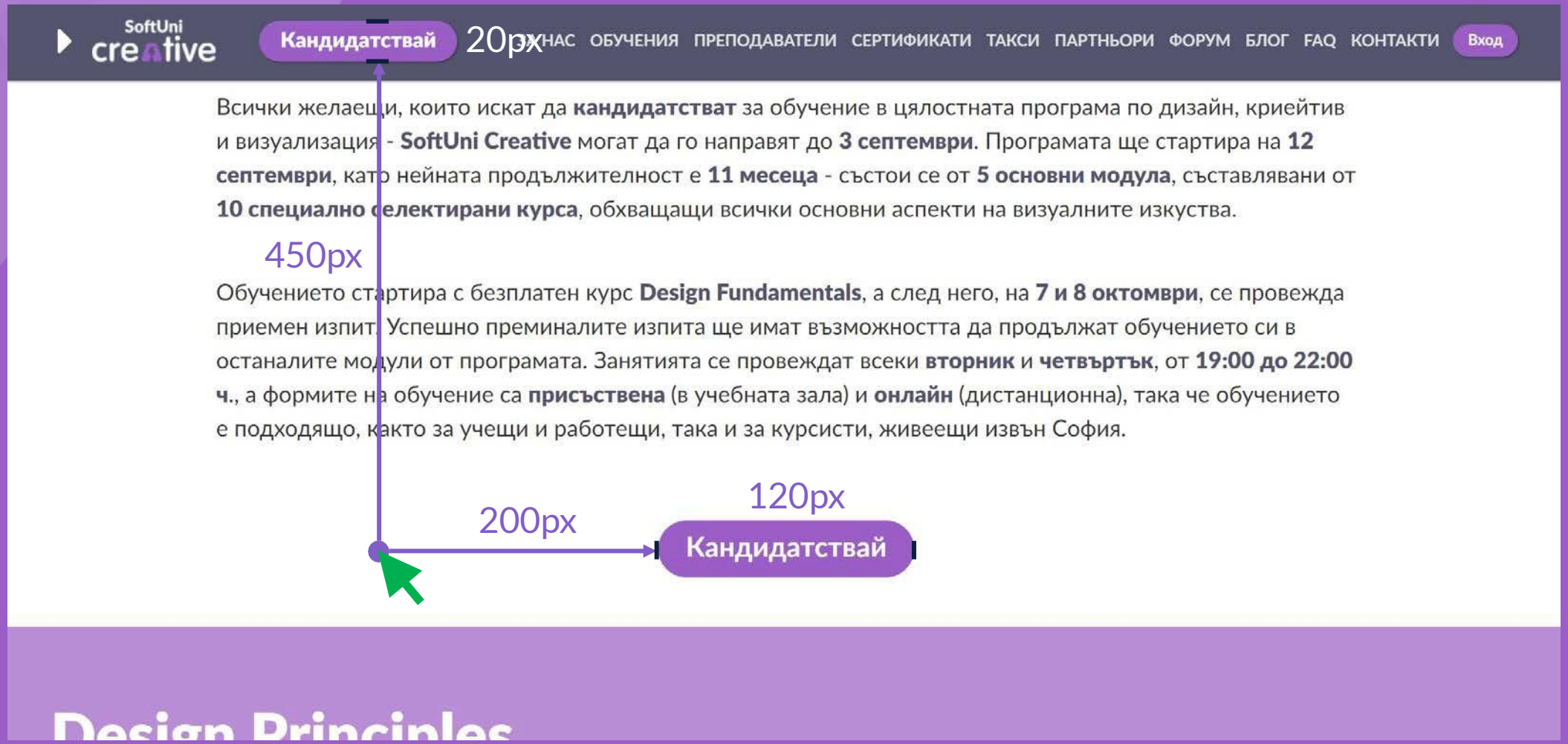
Tpos=$IM * ID\ ms$ IM=100 ID=log_2 $(2D/W)$

Fitt's law

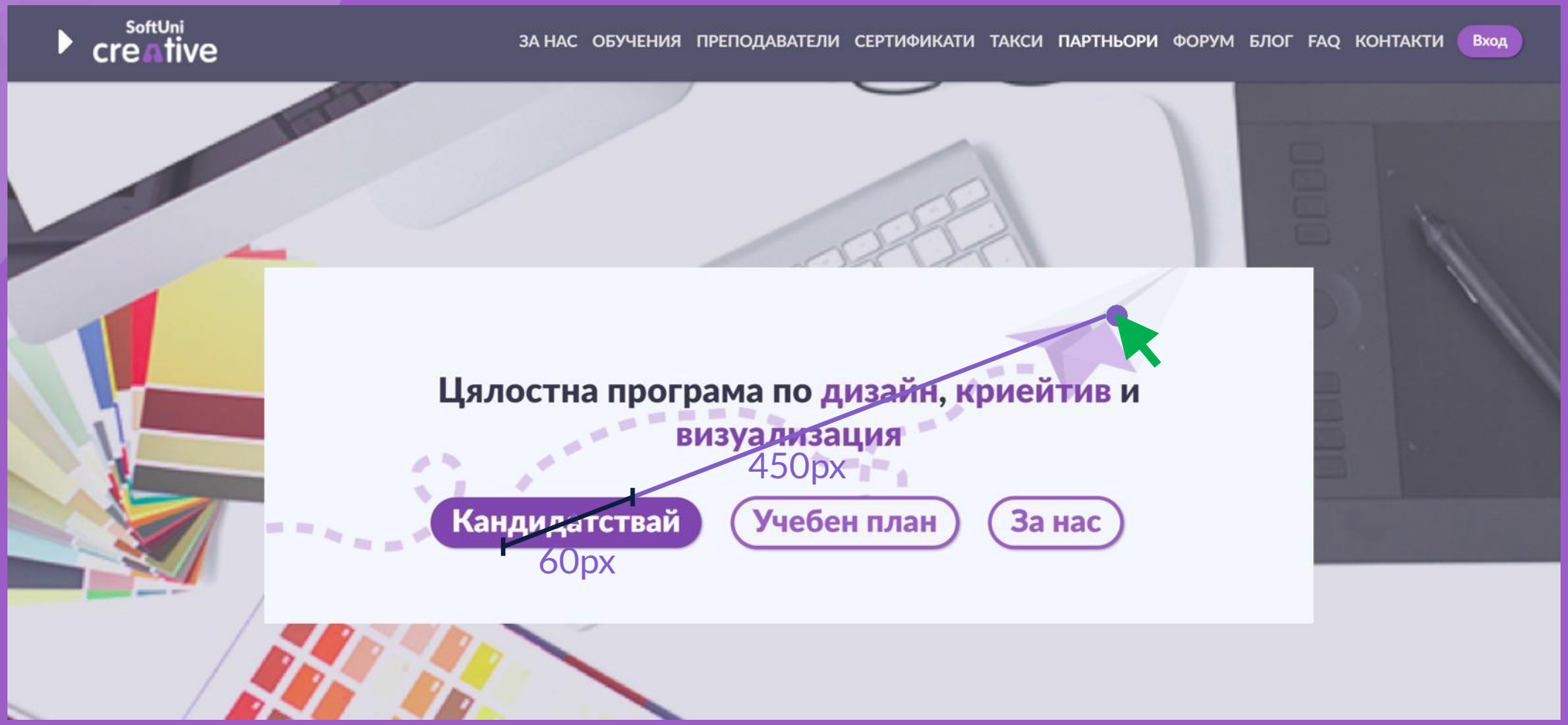
- Tap for 3 seconds between the pair of lines switching from left to right and vice versa every time
- Doubling distance between target adds constant time
- Doubling the target sizes reduces similarly to decreasing the distance between targets

Fitt’s law

Experiment


SoftUni creative
Кандидатствай
20px
ЗА НАС ОБУЧЕНИЯ ПРЕПОДАВАТЕЛИ СЕРТИФИКАТИ ТАКСИ ПАРТНЬОРИ ФОРУМ БЛОГ FAQ КОНТАКТИ
Вход
Всички желаещи, които искат да **кандидатстват** за обучение в цялостната програма по дизайн, криейтив и визуализация - **SoftUni Creative** могат да го направят до **3 септември**. Програмата ще стартира на **12 септември**, като нейната продължителност е **11 месеца** - състои се от **5 основни модула**, съставлявани от **10 специално селектирани курса**, обхващащи всички основни аспекти на визуалните изкуства.
450px
Обучението стартира с безплатен курс **Design Fundamentals**, а след него, на **7 и 8 октомври**, се провежда приемен изпит. Успешно преминалите изпита ще имат възможността да продължат обучението си в останалите модули от програмата. Занятията се провеждат всеки **вторник** и **четвъртък**, от **19:00 до 22:00 ч.**, а формите на обучение са **присъствена** (в учебната зала) и **онлайн** (дистанционна), така че обучението е подходящо, както за учещи и работещи, така и за курсисти, живеещи извън София.
120px
200px
Кандидатствай
Design Principles

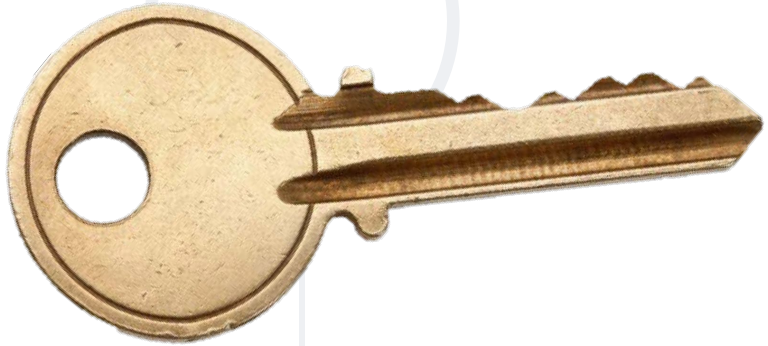
Experiment


SoftUni creative
ЗА НАС ОБУЧЕНИЯ ПРЕПОДАВАТЕЛИ СЕРТИФИКАТИ ТАКСИ ПАРТНЬОРИ ФОРУМ БЛОГ FAQ КОНТАКТИ
Вход
Цялостна програма по дизайн, криейтив и визуализация
450px
Кандидатствай
Учебен план
За нас
60px

Also works for real objects

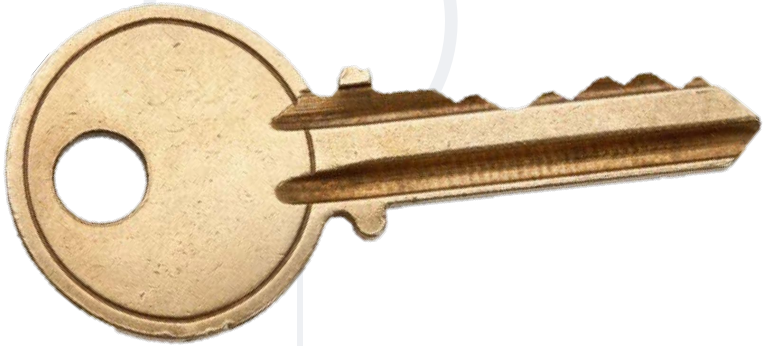
Conceptual models

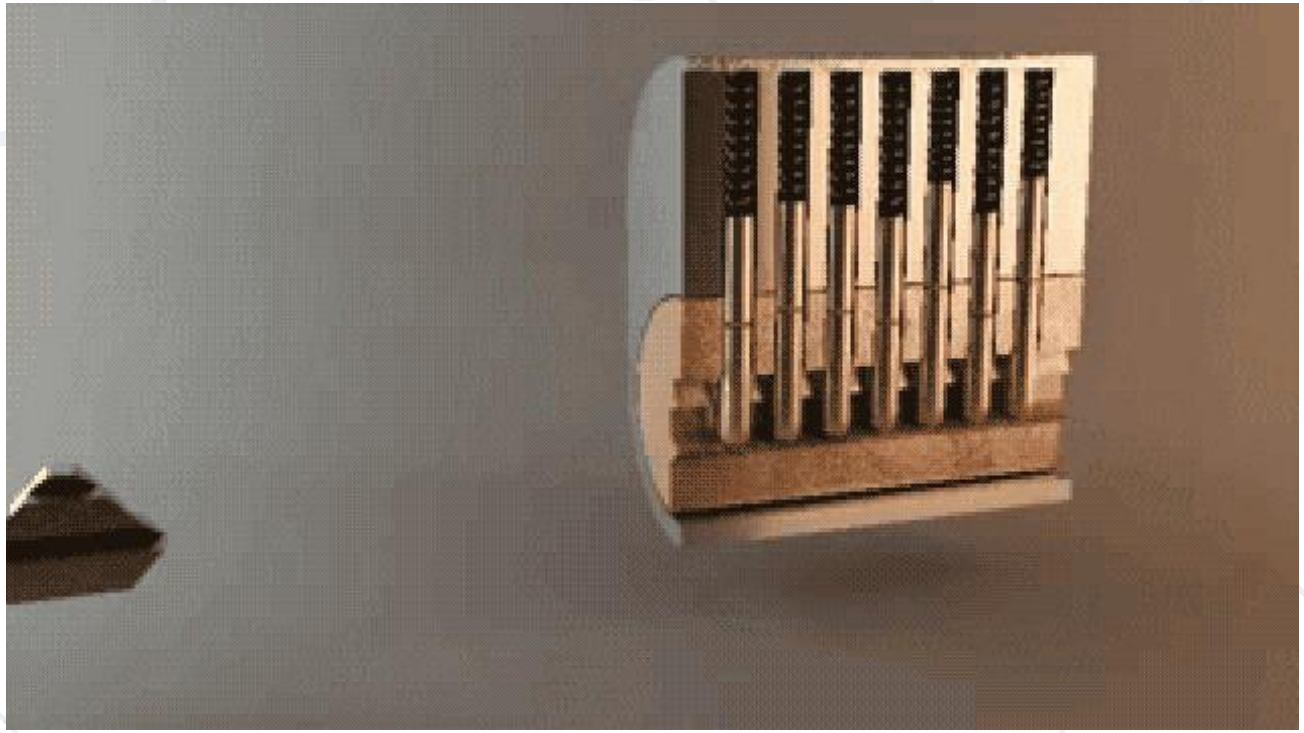
People create conceptual models of how things work



Conceptual models

People create conceptual models of how things work





Conceptual models

The designer’s goal is to stimulate the creation of a conceptual model that is as close as possible to the functional model of the object

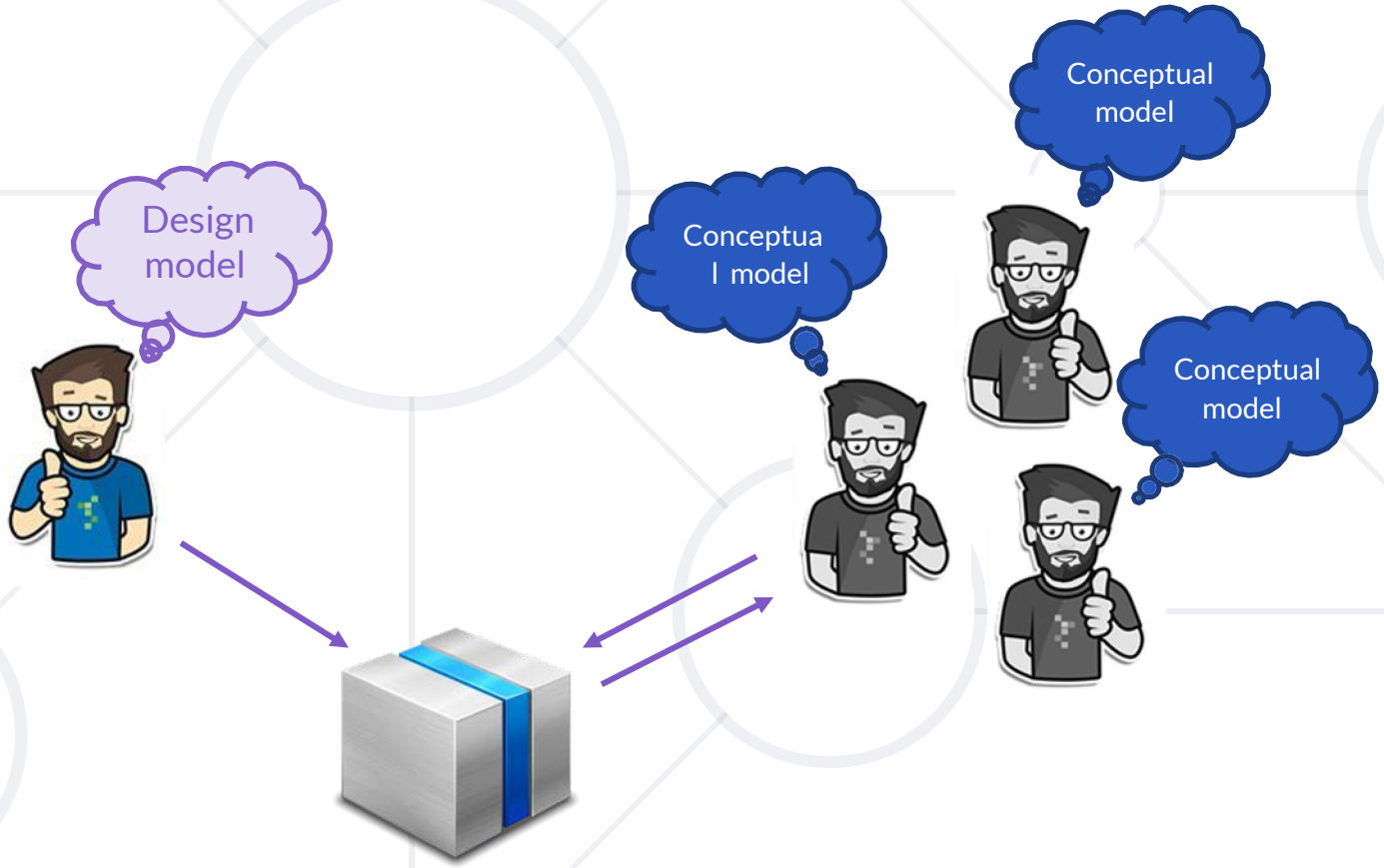
Conceptual models

Conceptual models

Conceptual models

- Allow us to predict the outcome of our actions
- Abide the rules of good design
- Use with care mappings and constraints
- Carefully craft a good conceptual model

Conceptual models



Exercise

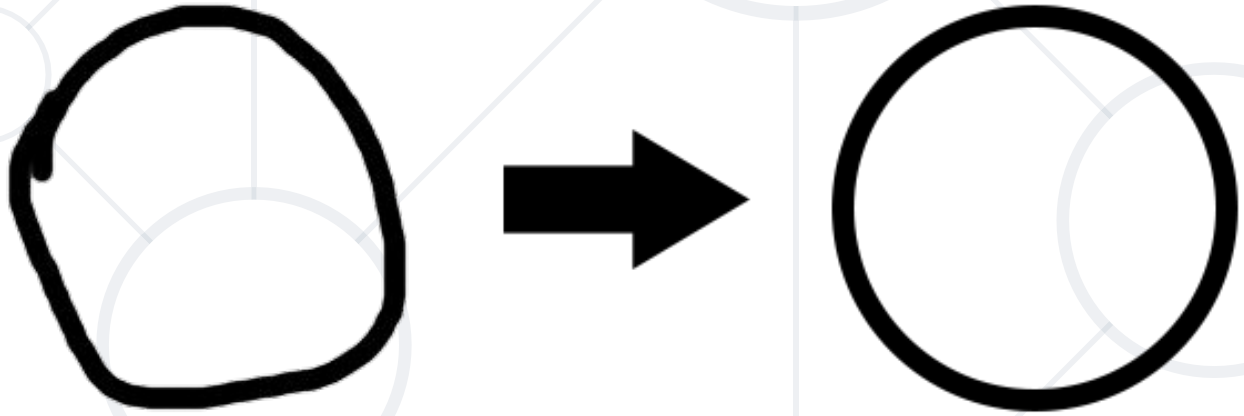
Share a frustrating experience of yours that was due to the mismatch between the models

Gestalt principles

- Wertheimer, Kohler & Kofka in early 20th century
- The whole is more than the sum of its parts
- Based on human perception
- Perception of belonging
- Guidelines for layout and alignment

Gestalt principles - Law of good shape

Human brain perfects the shape of an object (natural compressing algorithm)

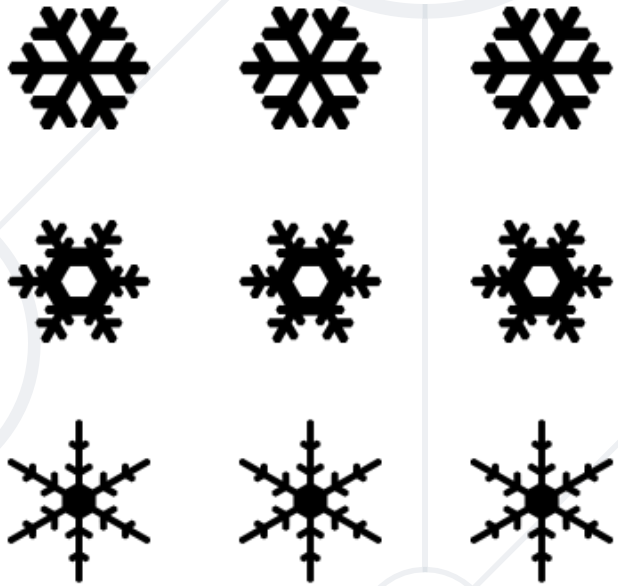


Gestalt principles - Proximity

Objects nearer to one another are perceived as belonging together

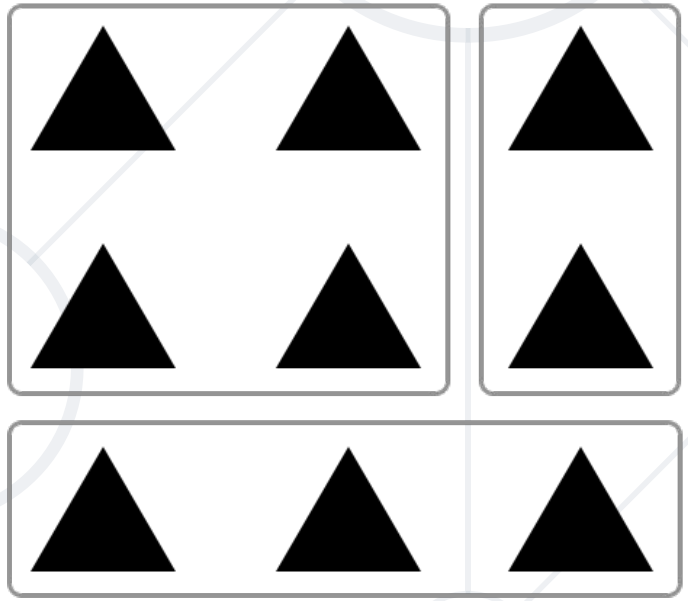
Gestalt principles - Similarity

Objects that are similar to one another are perceived as belonging together



Gestalt principles - Closure

Objects situated within an enclosed area are seen as a group

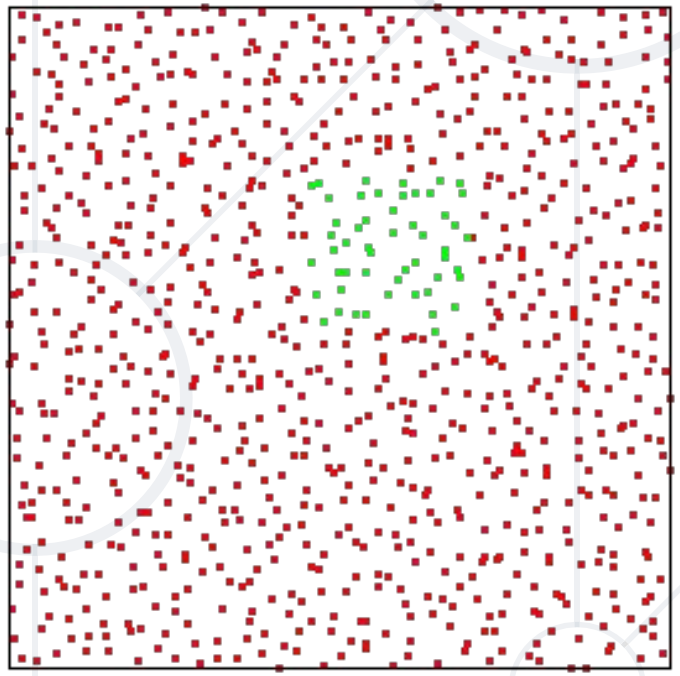


Gestalt principles - Previous experience

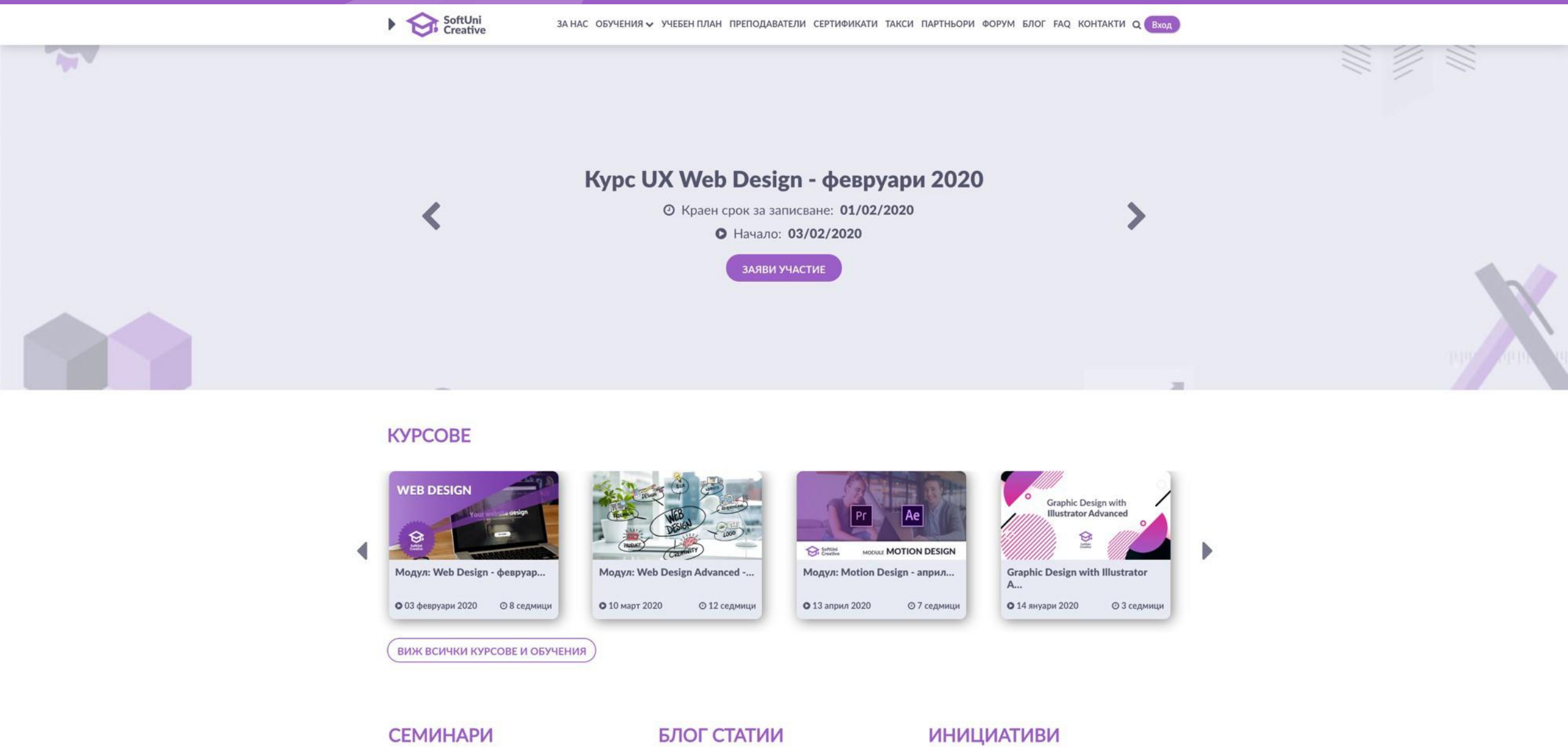
Human brain relies on previous experience when perceiving and interpreting information

Gestalt principles - Common faith

Objects with identical behavior are perceived as one



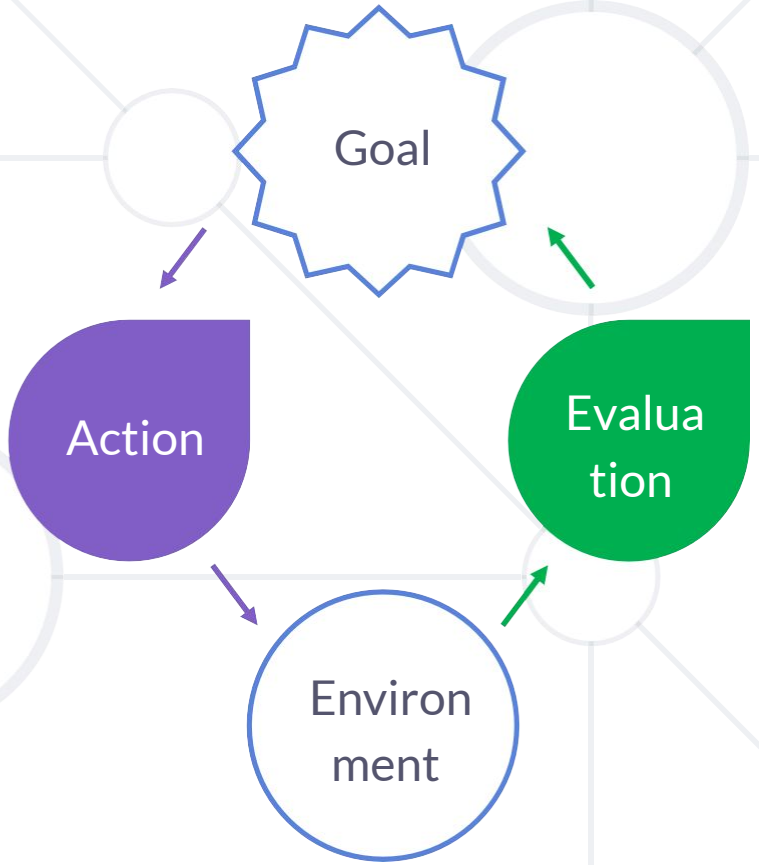
Exercise


SoftUni Creative
ЗА НАС
ОБУЧЕНИЯ
УЧЕБЕН ПЛАН
ПРЕПОДАВАТЕЛИ
СЕРТИФИКАТИ
ТАКСИ
ПАРТНЬОРИ
ФОРУМ
БЛОГ
FAQ
КОНТАКТИ
Вход
Курс UX Web Design - февруари 2020
Краен срок за записване: 01/02/2020
Начало: 03/02/2020
ЗАЯВИ УЧАСТИЕ
КУРСОВЕ
WEB DESIGN
Модул: Web Design - февруар...
03 февруари 2020
8 седмици
Модул: Web Design Advanced -...
10 март 2020
12 седмици
Pr
Ae
MODULE MOTION DESIGN
Модул: Motion Design - април...
13 април 2020
7 седмици
Graphic Design with Illustrator Advanced
Graphic Design with Illustrator A...
14 януари 2020
3 седмици
ВИЖ ВСИЧКИ КУРСОВЕ И ОБУЧЕНИЯ
СЕМИНАРИ
БЛОГ СТАТИИ
ИНИЦИАТИВИ


E
F
0
1
2
3
4
5
6
7
8
x1000r/min
L
H
ODO 65090
0
20
40
60
80
100
120
140
160
180
200
220
240
km/h
mph
C
H
OFF
INT
OFF

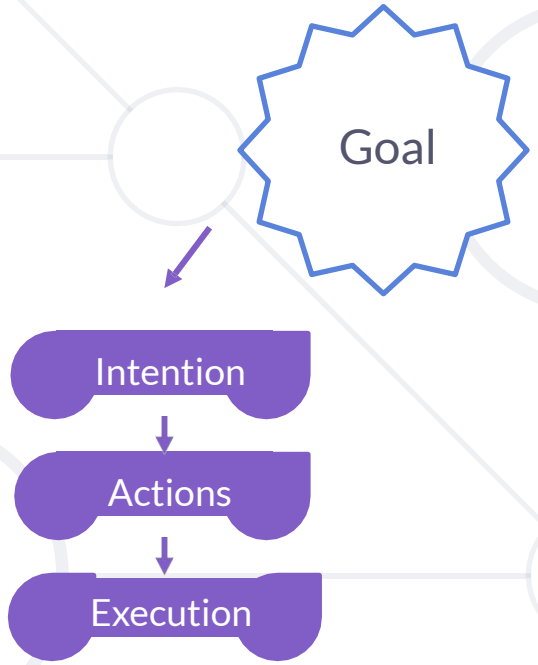
The seven stages of action

- Why do we fail upon encountering new products?
- What is the model of our interactions with the surrounding world?



The seven stages of action

- Abstract goals
- Define an intention
- Sequence of actions
- Execution

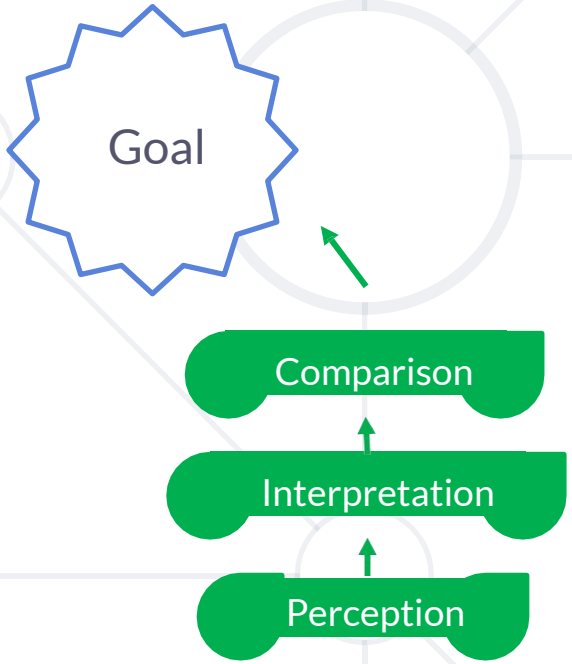


The seven stages of action

- There are always multiple paths towards achieving the same goal
- What if I were driving towards the sun and it was blinding me

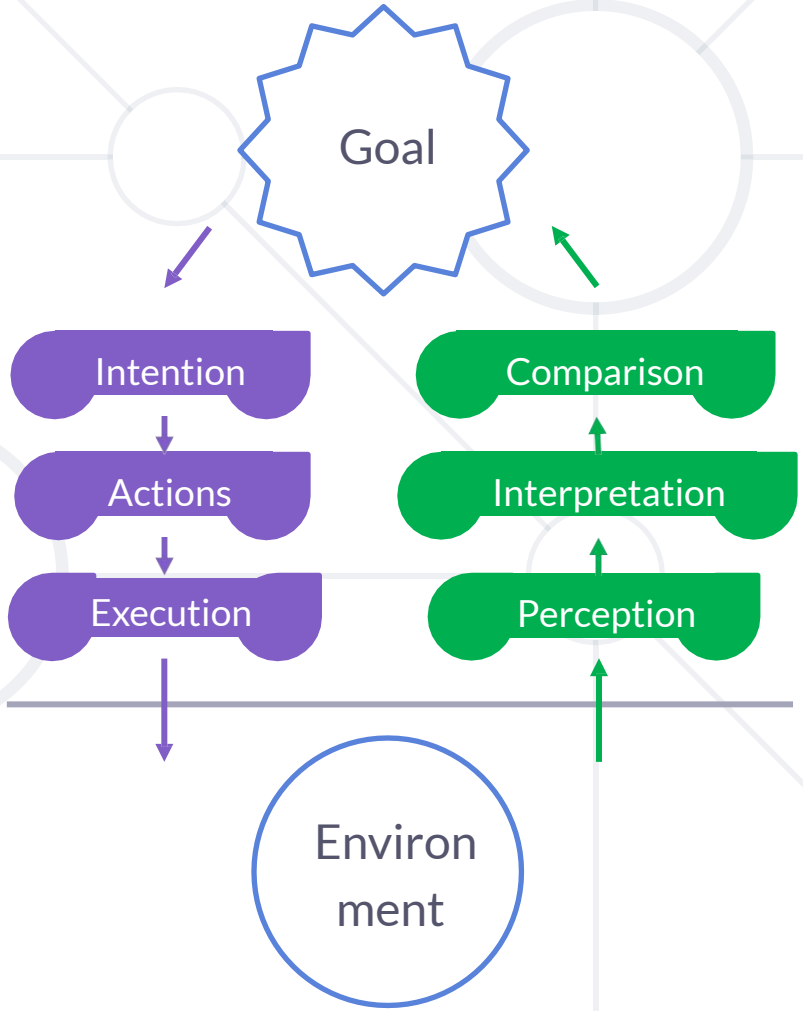
The seven stages of action

- Evaluation has also three phases
- Perception of the environment
- Interpretation of the state
- Comparison if the goal was reached



The seven stages of action

- Why do we fail upon encountering new products?
- What is the model of our interactions with the surrounding world?



The seven stages of action

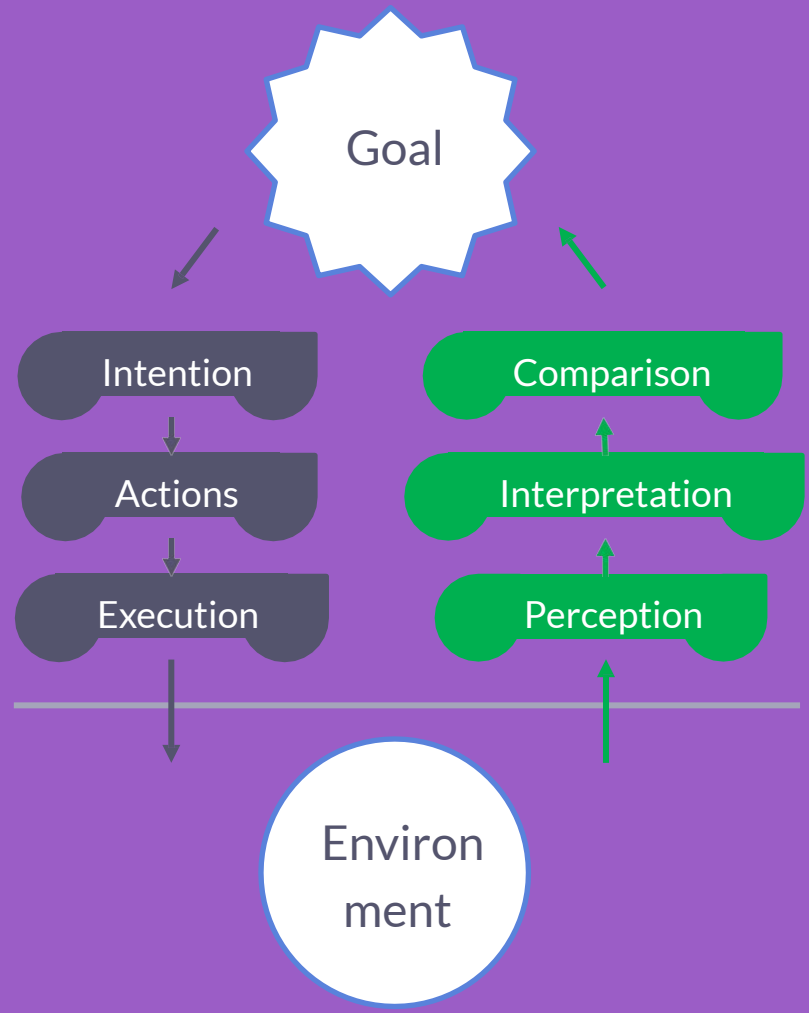
- They always happen in cycles
- We don’t follow them strictly all the time
- They work only for simple goals and tasks
- The model is not applicable for goals that we faced in a random fashion

Example

- It is dark
- I need more light
- I will go to the light switch and switch it on
- I go to the switch and flip it
- I perceive the light intensity in the room afterwards
- I interpret that it is now bright in the room
- I compare the previous and current state and see that my goal was achieved

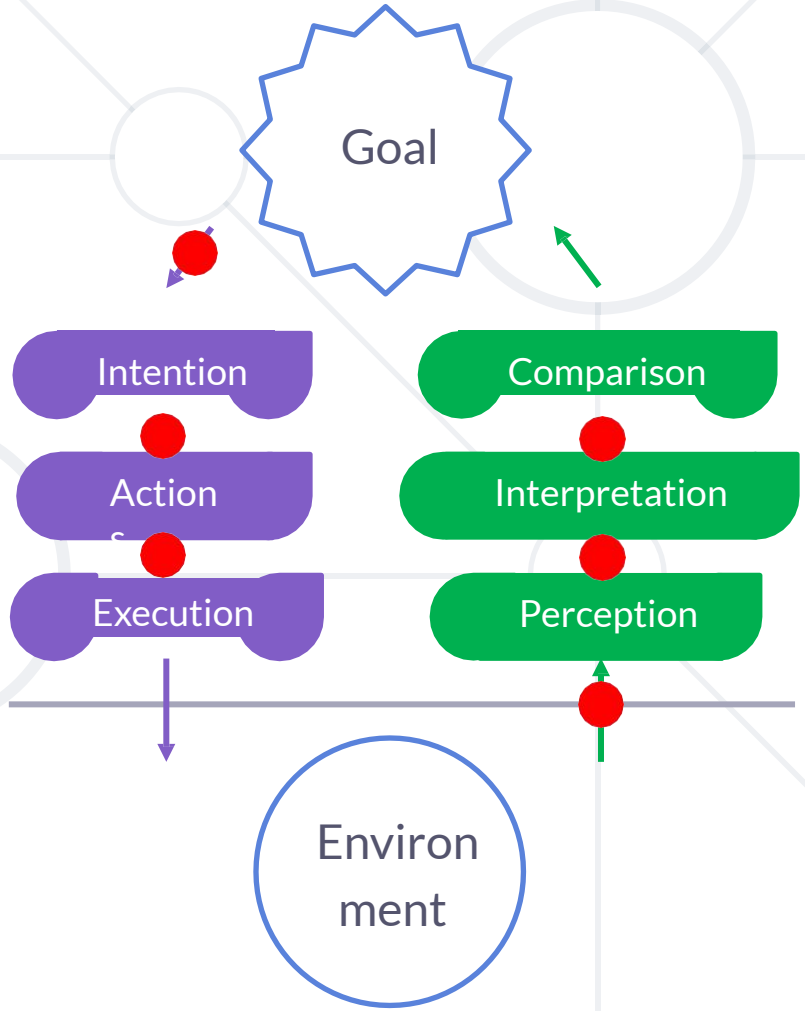
Exercise

Use the seven stages of action to define your own sequence for a task



Gulfs

- Six potential gulfs
- Three gulfs of action
- Three gulfs of evaluation



The seven stages for better design

Use them as a design guideline

How easy is it to

- perceive the system functions?
- define the possible actions?
- connect logical and basic actions?
- perceive the system status?
- interpret the system status meaning?
- determine if the goal has been achieved?

- Goal
- Intention
- Action sequence
- Perception
- Interpretation
- Comparison

Mappings

- Show the relation between interface and the physical world
- Show the relation between input and output of information

Mappings

- Natural mappings are based on physical analogies: spatial, perceptual, biological and cultural
- They are quick and easy to understand
- They require no remembering
- They improve the experience for beginner users

Exercise

What is your take on the position navigation controls?

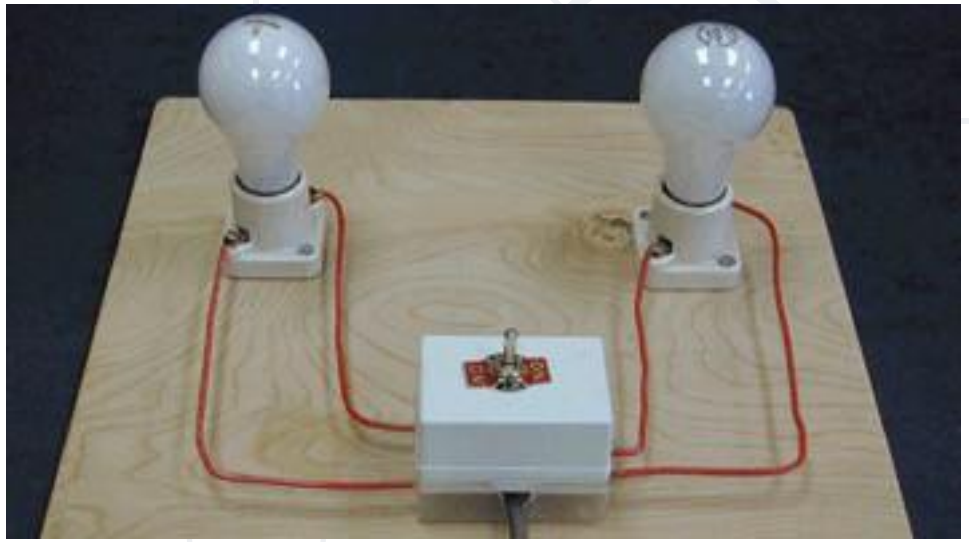
What is your take on the controls for lowering and picking the claw?

Exercise

Replace the rotary volume control with a slider. What would be its orientation?

Spatial mappings

- The most frequently used type of mapping
- Controls are arranged in a fashion mimicking the spatial arrangement of the items they control



Spatial mappings

- A cooking stove
- How are the controls mapped to the heaters
- Labeling is not solving a problem, but rather hiding bad design

Perceptual mappings

- Controls for an object mimic its physical appearance
- Form, shape, color, location

Biological mappings

- Up means more
- Valid for additive variables only, not for substantive
- Content is laid out top to bottom

Cultural mappings

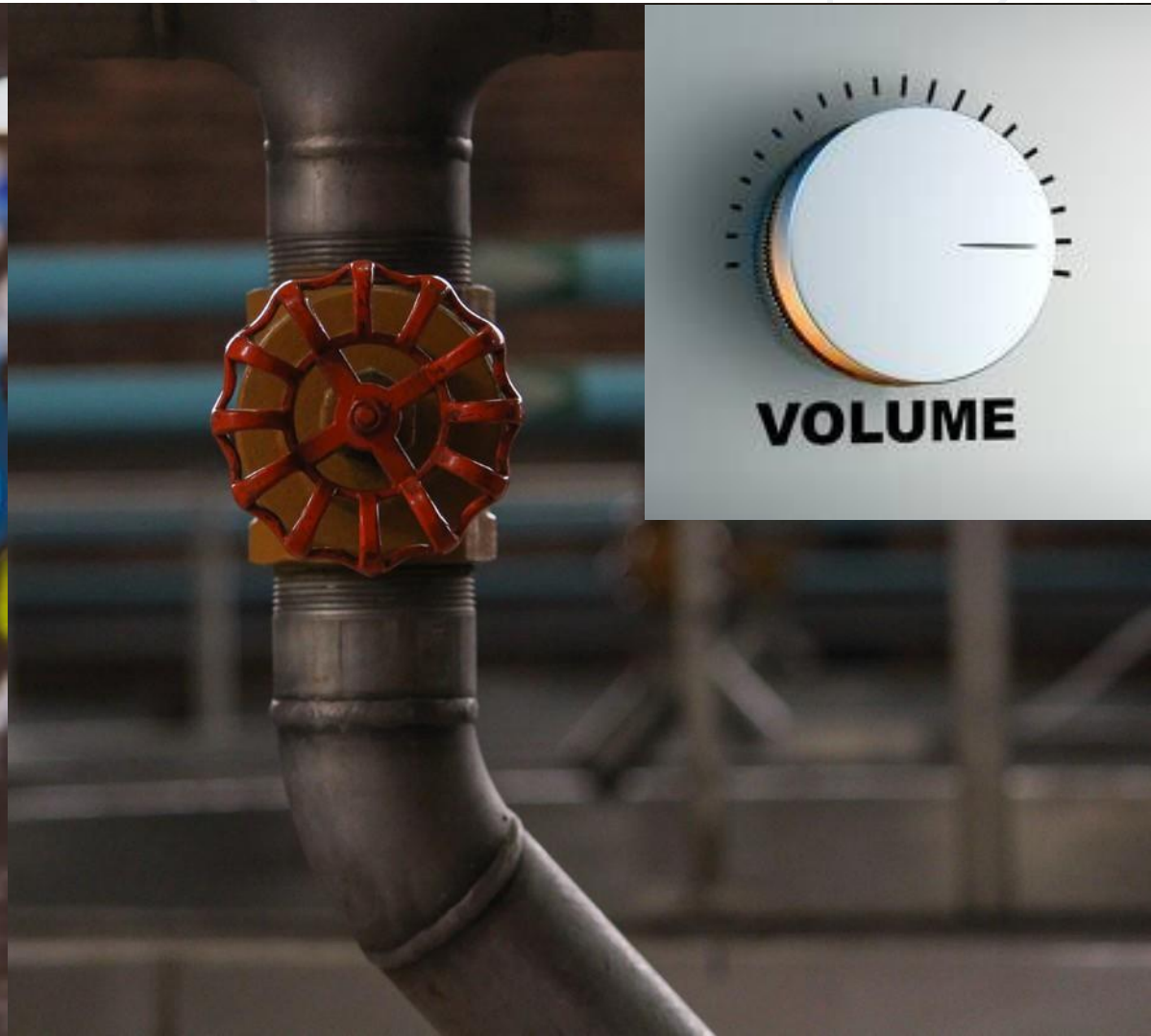
- Celsius and Fahrenheit
- Red means decrease in western and increase in eastern cultures

Affordances

Properties put in the design of a product suggesting to the user how it can be used

- Intentionally suggest to the user scenarios for using the product
- No need for labels, instructions and tutorials
- Work for simple functionalities only
- Improve the usability of the product
- False affordances

Affordances



Exercise

Signifiers

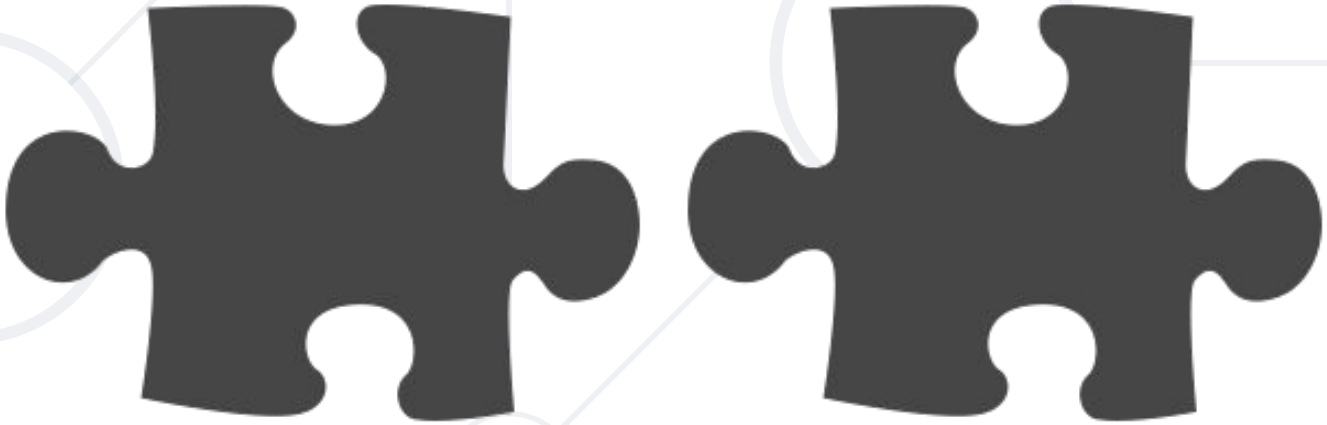
Social signs that indicate events from the physical and social life that could bear a certain meaning

Constraints

- We limit how a product can be used
- They are conceptually the opposite of affordances
- Help us to avoid mistakes and dangerous states
- They can be physical, semantic, logical and cultural

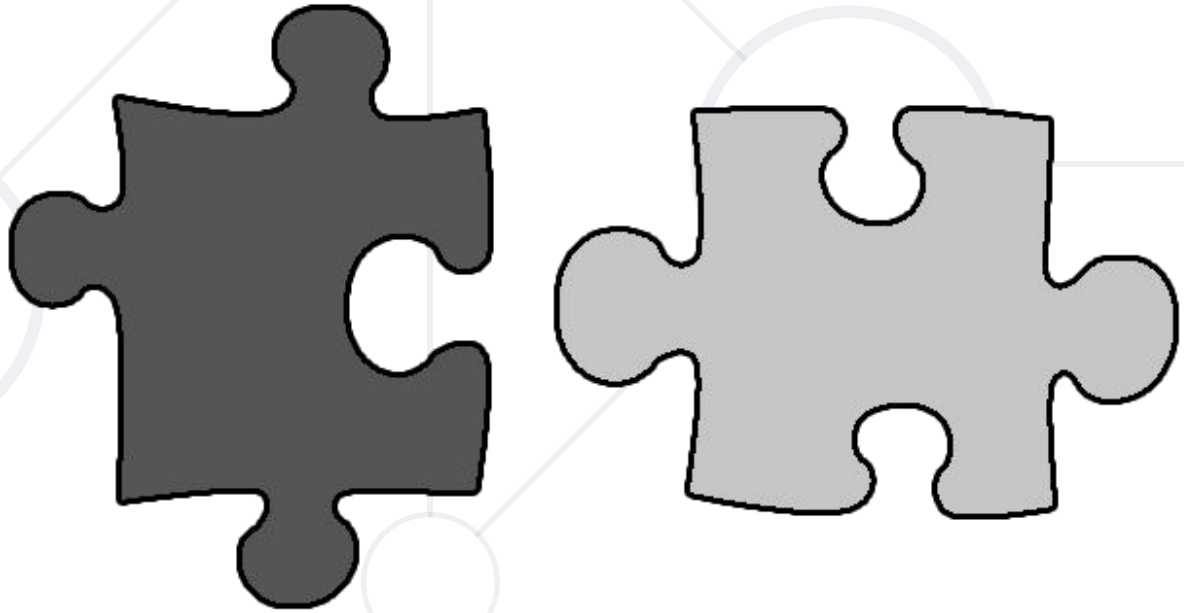
Physical constraints

- Limit the number of physical actions
- Embedded in the shape of the object
- The more obvious they are the better they work



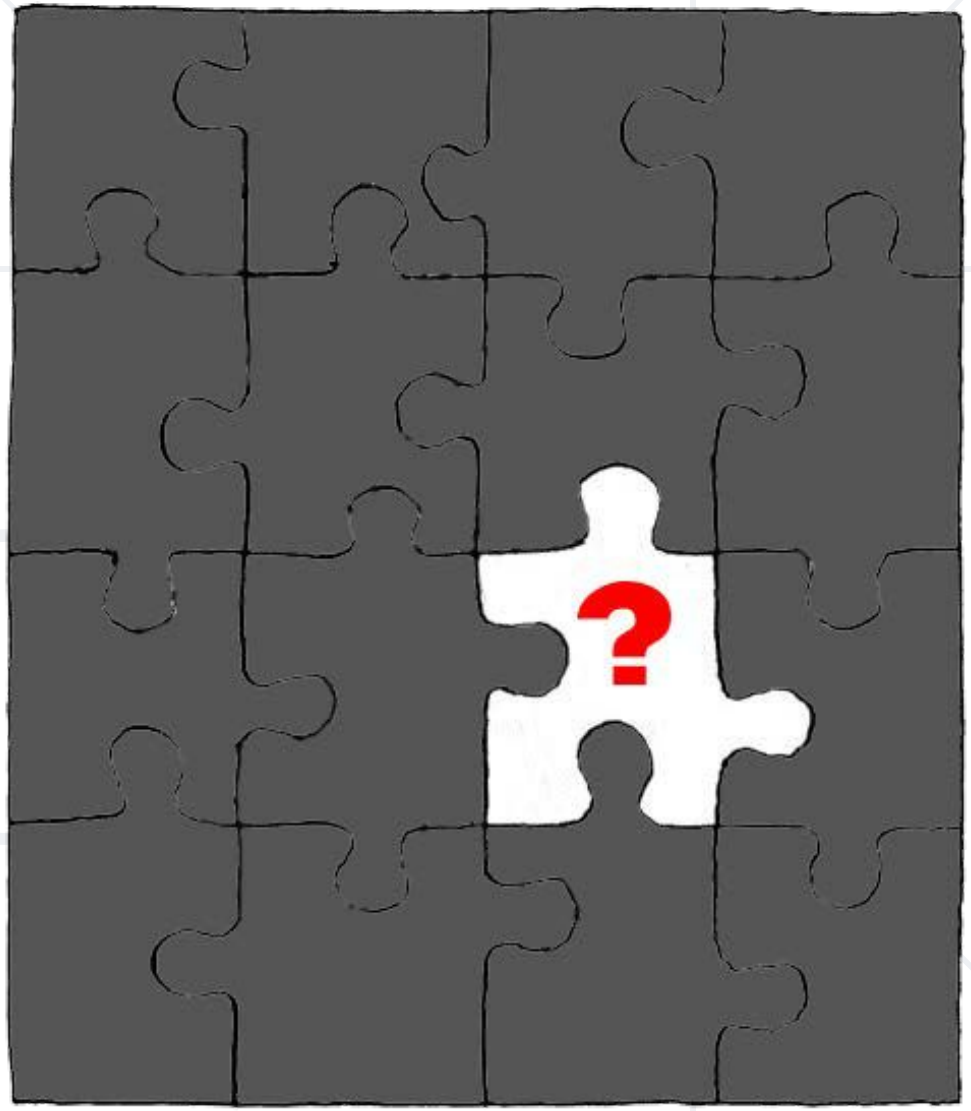
Semantic constraints

- Based on general knowledge and the current context
- Improve intuitiveness
- Valid within a limited group of people



Logical constraints

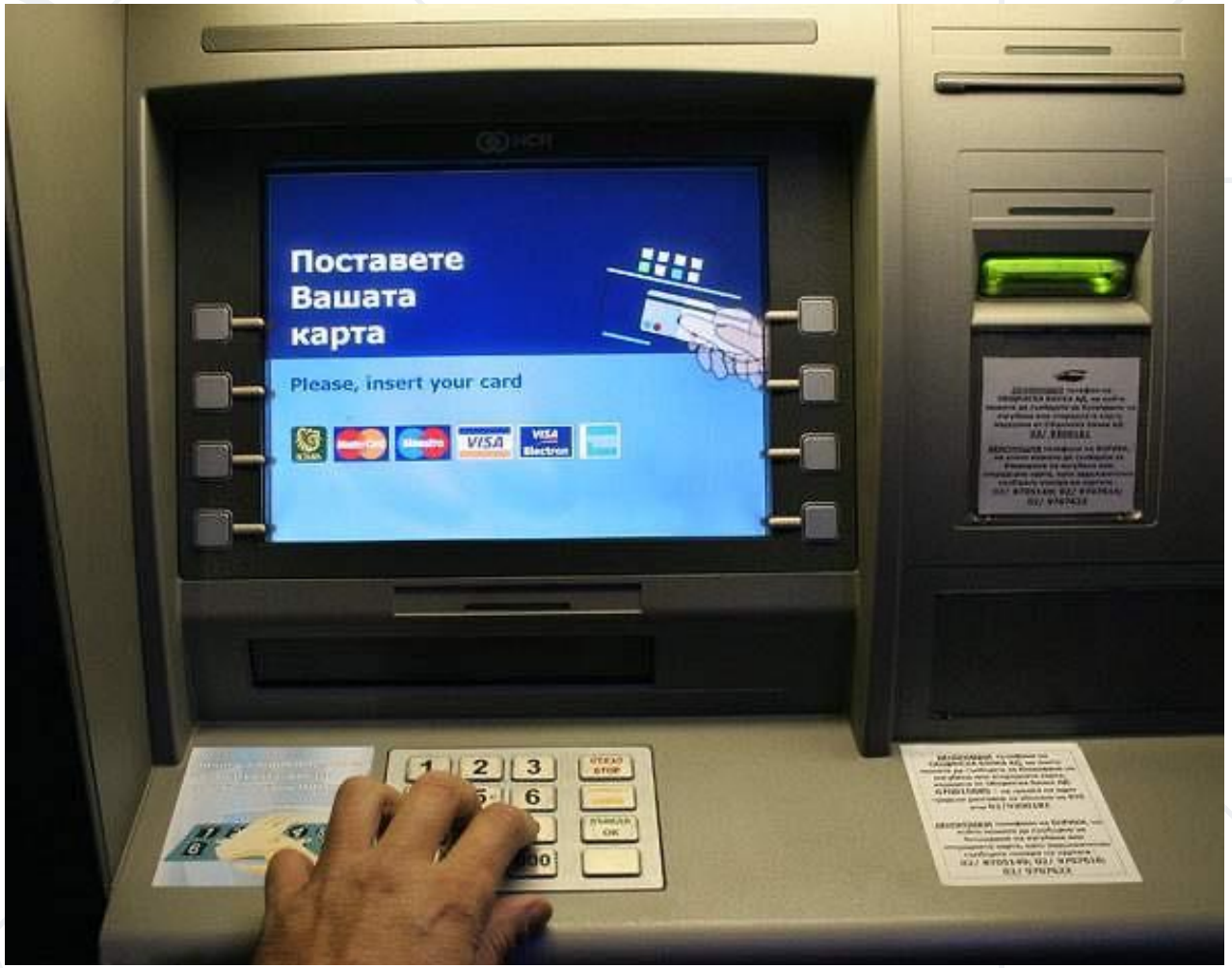
- Used to discard possible solutions
- They frequently embed constraints



Cultural constraints

- Based on common cultural norms
- Applicable within a limited group of people

Constraints



Types of knowledge

- Much of the knowledge is in the world around
- Our behavior is determined by the simultaneous use of what is around us and our memory
- Our memory need not be precise more than the allow us to interpret our environment correctly
- What is found on the back of the 5 leva bill?

Improving memory

Nature’s first green is gold,
Her hardest hue to hold.
Her early leaf’s a flower;
But only so an hour.
Then leaf subsides to leaf.
So Eden sank to grief,
So dawn goes down to day.
Nothing gold can stay.

- Constrains limit the number of items we memorize
- There are certain techniques for improving memory through lowering quantity, precision and depth of information

Types of knowledge

Knowledge of facts

- facts
- rules
- law
- easy to describe and teach, but not to learn

Know-how

- playing the guitar
- driving
- walking
- Subconscious, hard to describe and teach, but possible through showing

Memory capacity

- Random facts we memorize not so well
- Connected facts we remember easier
- What we understand get memorized the easiest
- Think about all the passwords, PINs, phone numbers, addresses and birthdays you remember

Knowledge in the world

- No need to memorize, only to interpret
- It is always present for us to perceive
- Does not work if not important in the current context
- We can exploit it by leaving reminders

Types of knowledge

Knowledge in the world

- present to observe
- no need to memorize
- low efficiency
- need for interpretation
- usable by beginners

Knowledge in our mind

- relatively small size
- difficult for beginners
- high efficiency
- hard to obtain
- invisible

Exercise

How are different keyboard users different from one another – beginner / advanced / experts?

Mistakes

- People make constant mistakes with everyday products
- Learned helplessness leads to disappointment and lower self esteem of the users
- The fault for an error is not user's but of the designer
- It is not "dummies" who make mistakes but users with bad conceptual models
- Mistakes can be two types: learned and provoked

Learned Mistakes

- Result from the formulation of a wrong goal
- Hard to spot because the user is convinced, he does the right thing
- They often regard important events
- We make wrong assumptions or faulty causal relationships

Exercise

Share a personal example of admitting such conscious errors.

Provoked Mistakes

- The most frequent mistakes we make
- With the correct goal we make a mistake while executing the action sequence
- Small inaccuracies that we usually catch immediately
- They often happen for frequent and largely subconscious activities we perform

Capture errors

- Two actions with very similar beginning but very different end
- The more frequent action captures the less frequent one
- Getting off the subway on the stop for work on a weekend

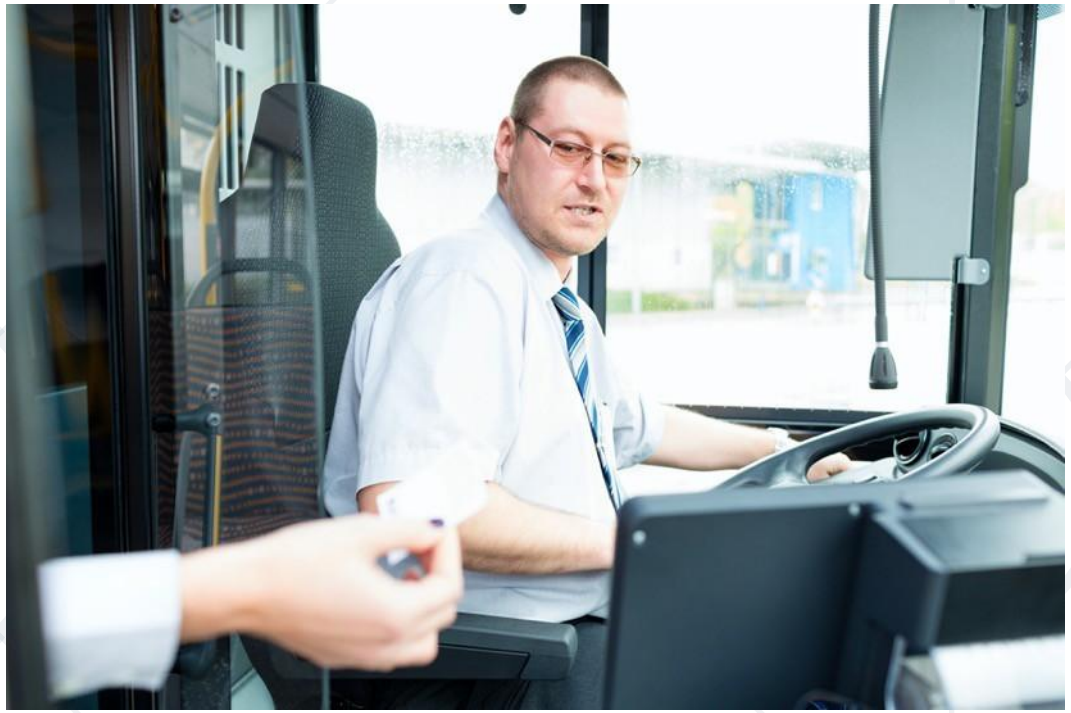
Bad description errors

- Our intention lacks enough description and allows for multiple action sequences
- Takes place often with object that are near one another
- Switching on one heater and placing the pan on another

Incoming information errors

- Incoming information while we are following the action sequence influences it
- Dialing a phone number while the radio is on and they announce the frequency
- Typing a word document while listening to music and entering its lyrics

Association errors



- An internal association that we have provokes a wrong action
- Thinking for last night at lunch and wishing someone good night
- Calling people with wrong names because we think about someone else

Forgetting errors

- We forget the goal while executing the action sequence
- We can reactivate the actions by going back to where the goal was formed
- We go next door to tell a colleague something and we can’t remember what

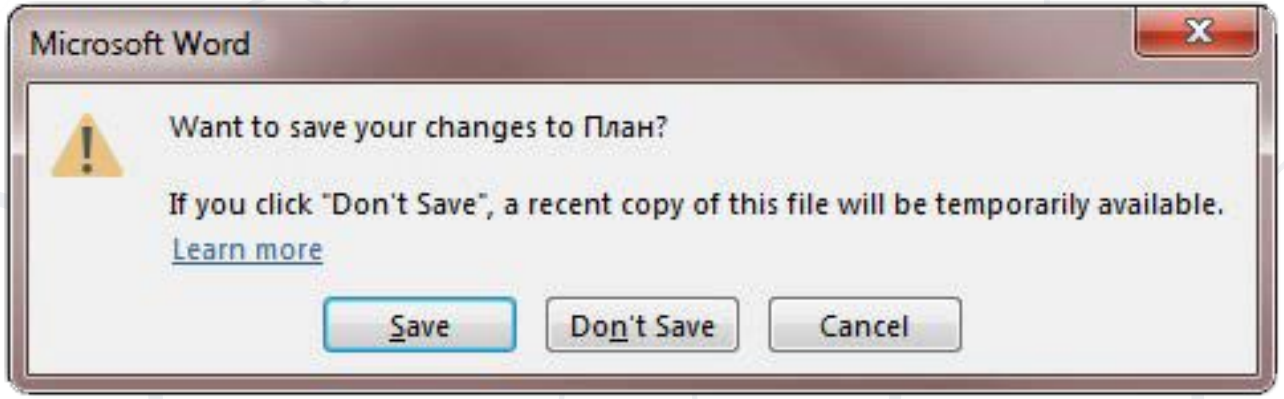
Premature completion errors

- We complete the action prematurely because a large portion of it has been completed
- A while ago a friend forgot his credit card in a ticket machine in Berlin as he left with his train ticket once it got printed
- How does and ATM function

Mode errors

- We face a device with different operating modes
- We perform a wrong action because the system is in a different mode from the one, we expect it to be
- Most frequently met in digital and software products
- Setting the exposure / shutter speed of a camera

Design for errors



- Admit that any possible mistake may and probably will be done
- Lower the possibility for the user to make mistakes
- Soften the effect of a mistake when it occurs
- Make mistakes easy to discover and undo
- Users neglect warnings
- Don’t punish your users for their mistakes

SoftUni creative

Handy Tip:

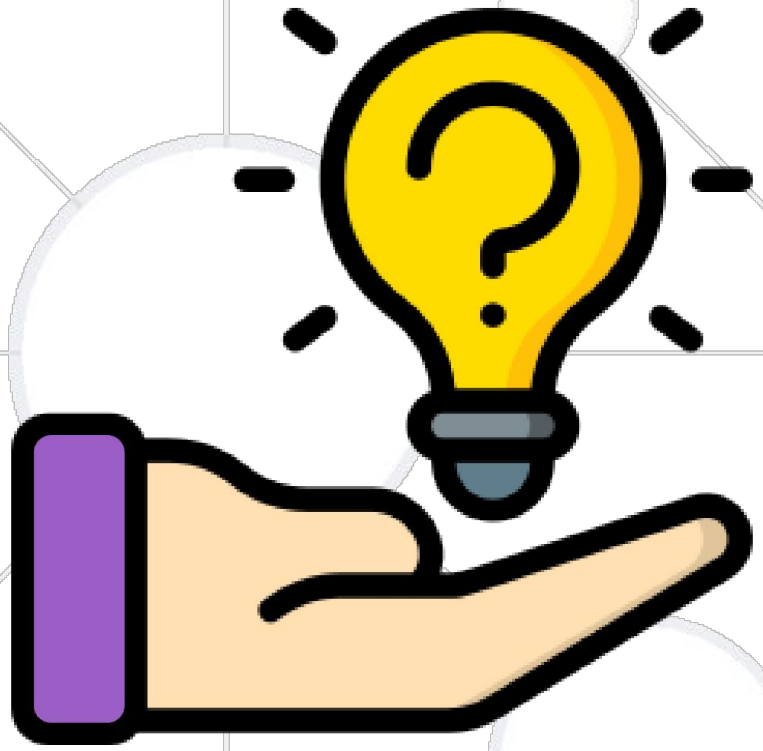
To understand more about your area of choice for your project and the types of users who may be attracted to it, create a survey and try to collect at least 20 responses to it.

Summary

SoftUni Creative

- What is User Experience?
- What is human processor model?
- Fitt's law
- What are conceptual models?
- Gestalt principles
- What types of knowledge do we know?
- Mistakes

SoftUni Creative



Questions?

SoftUni Diamond Partners

SoftUni Creative

SOFTWARE GROUP

Postbank
Решения за твоето утре

SUPER HOSTING .BG

PHAR VISION

SmartIT

taulia

DRAFT KINGS

SCHWARZ

LIDL

Kaufland

SCHWARZ Produktion

prezero

INDEAVR
Serving the high achievers

Coca-Cola HBC Bulgaria

POKERSTARS | CAREERS

createX

MOTIONSOFTWARE

Organization Partners

SoftUni Creative

PIXEL HOUSE
WEB AND GRAPHIC DESIGN STUDIO

ARETÉ

SHED

fontfabric

INFRAGISTICS®

дизайнът на нещата

THE BUCKS TOWN'S WORK

License

- This course (slides, examples, demos, exercises, homework, documents, videos and other assets) is **copyrighted content**
- Unauthorized copy, reproduction or use is illegal
- © SoftUni – https://about.softuni.bg
- © SoftUni Creative – https://creative.softuni.bg

About SoftUni Creative

- SoftUni Creative – High-Quality Education, Profession and Job for Designers
  - creative.softuni.bg
- SoftUni Creative @ Facebook
  - facebook.com/SoftUniCreative
- SoftUni Creative Forums
  - softuni.bg/forum/categories/116/softuni-creative