

# **UX**

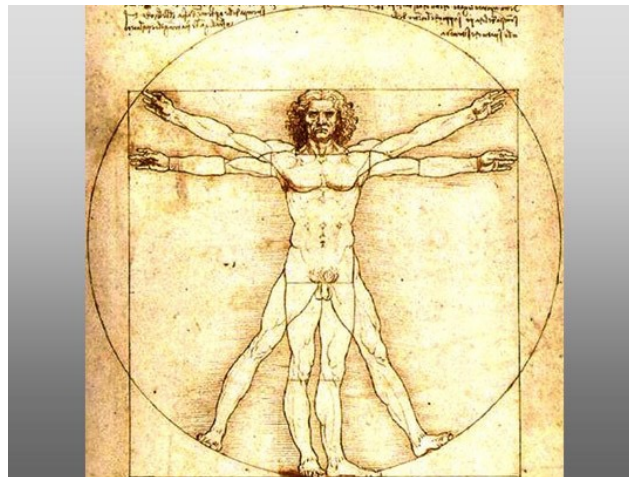
## **parte 2**

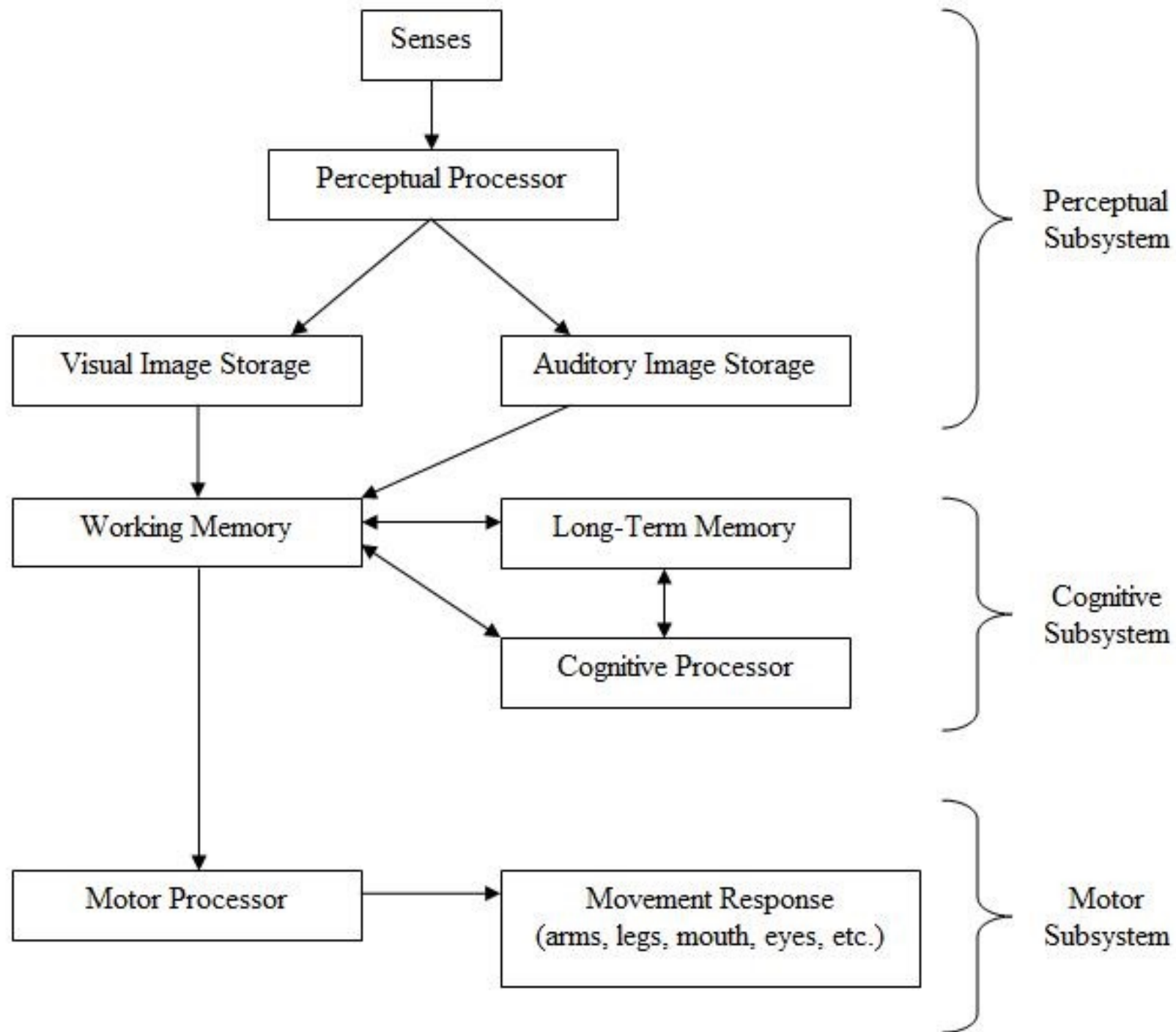
**Prof.ssa Cristina Gena**

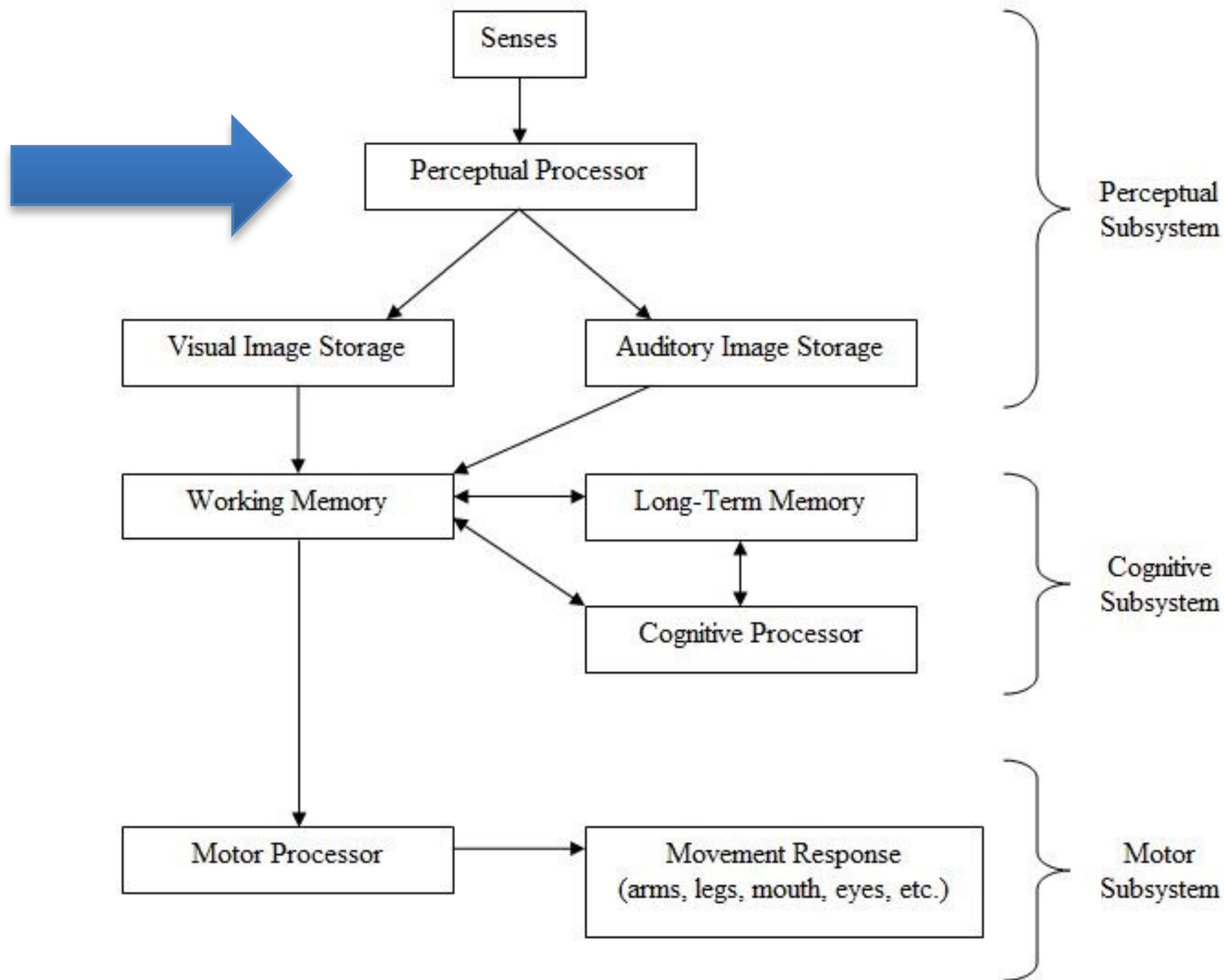
As a basis, we take the Model of the Human Processor. This is a very simple 'model' of a human interacting with a computer.

The model describes the human as three sub-systems

- **Perceptual system** (acquire input from the real world)
- **Cognitive system** (connection between input and output)
- **Motor system** (manipulate the real world)







# Perception and recognition

How information is acquired from the world and transformed into experiences

Obvious implication is to design representations that are readily perceivable, e.g.

- Text should be legible

- Icons should be easy to distinguish and read

# Perception: Gestalt principles of form perception

## The whole is greater than the sum of its parts

Gestalt psychology attempts to understand psychological phenomena by **viewing them as organized and structured wholes** rather than the sum of their constituent parts.

In the 30s and 40s, Gestalt psychology was applied to **visual perception**, most notably by Max Wertheimer, Wolfgang K  hler, and Kurt Koffka who founded the so-called gestalt approaches to form perception.

The investigations in this subject crystallized into '**the gestalt laws of perceptual organization**'. Some of these laws, which are often cited in the HCI or interaction design community, are as follows.

# Law of similarity

Elements will be **grouped** perceptually if they are **similar** to each other.

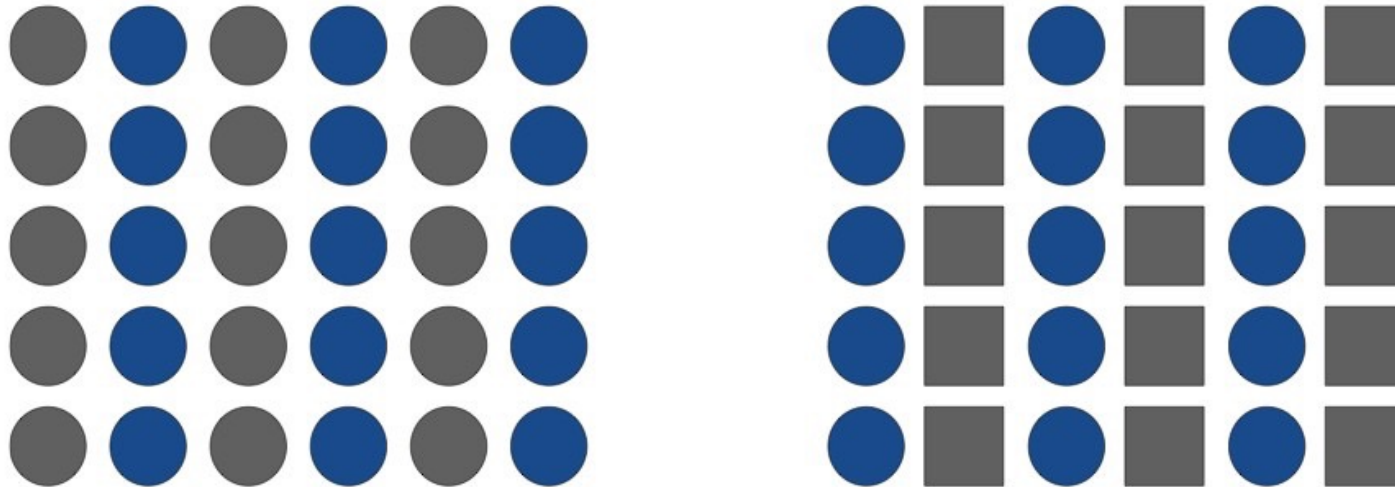


Abbildung 3.25: Gruppierung nach dem Gestaltgesetz der Ähnlichkeit

*The objects are grouped by your cognition into vertical rows of similar objects. Similarity can result from shape, brightness, pattern, colour.*


Eet groente mee (mits Betjeman & Barton meets Ikea)

- Uit eten in Berlijn
- Salade met courgette, bonen & tomaten


**Volg ons op**

**facebook**


**twitter**

 **StridesKreatief** tweeted  
@Vegatopia

*Iemand nog een verrassend recept met komkommer voor me? Veel komkommers in mijn kas. Echt komkommertijd;-) about 1 hours ago from web*

 **EetWeters** tweeted  
Vegatopia:

*Norvisjes - @Vegatopia  
http://bit.ly/iPRVxg  
about 2 hours ago from twitterfeed*

 **ZitiZitoni** tweeted  
@vegatopia

...vondt. Daarom heb ik een eigen moestuin, waar ik naar hartelust uit kan koken.


Toen redacteur Annemieke mij vroeg om een recept te bedenken, wist ik direct dat het iets met bernagie moest zijn.

**Lachaniká kai yiaourti**

Geschreven door Eelco

zondag, 19 juni 2011 08:00

Zeg nu zelf, dat klinkt toch een stuk smakelijker en exotischer dan 'groente met yoghurt'. Het is weliswaar geen origineel Grieks recept, maar wel zeer prijsbewust en mediterraan. Bovendien staat het in een mum van tijd op tafel, zodat je des te langer kunt mijmeren over de gevolgen van de eurocrisis - of misschien toch over vrolijker zaken, zoals de zomervakantie, die met rasse schreden naderbij komt.




**Tea time bij Betjeman & Barton**

Geschreven door Jannika

vrijdag, 17 juni 2011 11:50

Dat de ene thee de andere niet is, bleek wel uit de masterclass die ik bij het theemerkt Betjeman & Barton in Den Haag volgde. Eigenaresse van de winkels en exclusief importeur van het merk, Marion van den




hartstikke lekker. Combineer het vervolgens met wat 'nordic' invloeden afkomstig van Ikea en een fusionlunch is geboren.

**Drop-semifreddo**

Geschreven door Lizette

zaterdag, 18 juni 2011 07:00

Italiaanse drop plakt niet klef tegen elkaar aan in een inderhaast opengescheurde zak, waaruit de helft van de dropjes onder in je tas belandt en waar meteen nog wat kruimels of mens- of dierenharen aan vastplakken. Nee, Italiaanse dropjes rammelen gezellig in hun blikken doosje, een bescheiden "hier ben ik!" En je kunt er ook mee koken.




**Leuke Lunch: Midden-Oosterse Bento**

Geschreven door Meta

donderdag, 16 juni 2011 07:00

Bij het woord 'bento' is vast niet je eerste associatie: Libanon, Tunesie of Marokko. Bij mij ook niet, maar in de praktijk vind je in mijn bento-boxen vaak smaken terug uit dat



**Actueel op het forum**  
**Vegatopia Webforums**

Re:Wat eten we vandaag?  
Citaat van: greet op **Gisteren** om 19:54:26  
Citaat van: Maartje! op Juni 20, 2011, 22:21:47  
Imam bayildi en geroosterde bloemkool. Met de laatste witte boterhammetjes van L, Griekse yoghurt en ...

Re:Kookblunders  
Citaat van: Ger@ña op **Gisteren** om 17:50:31  
Zachtgekookte eieren pel je toch ook helemaal niet?

Eh.. je wou ze met schil en al consumeren? Oh wacht je bedoelt dat men ze alleen uitlepelt. Nee, ik pel soms ook, bv...

Re:Kookblunders  
Huh? Krijgt Aiko een ei uit zijn schaal én velletje zonder een ei te schrikken? Lepelende?  
Enne, sinds ik een egg-timer heb gaat het een stuk beter met het koken van een ei, alleen het schrikken, dat valt in mijn hoofd toch in het 'je poetst toch ook j...

Re:IJs maken  
Binnenkort hebben we op de voorpagina een ijspecial en nu ben ik benieuwd naar jullie ervaringen met ijsmachines!

Welke merk hebben jullie en wat voor type (zelfvriezend of met een bak die in de vriezer moet), zijn jullie tevreden, wat zouden jullie g...

Figure: Use of similarity: blog posts have the same caption and image frame; the feeds in the left and right column follow a similar design.





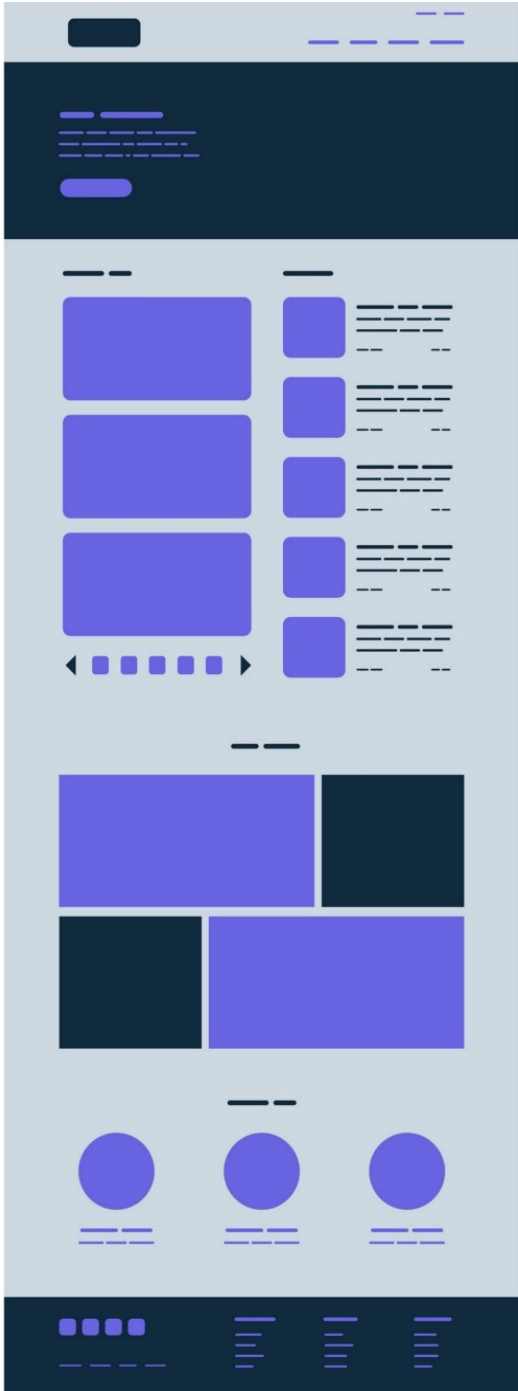
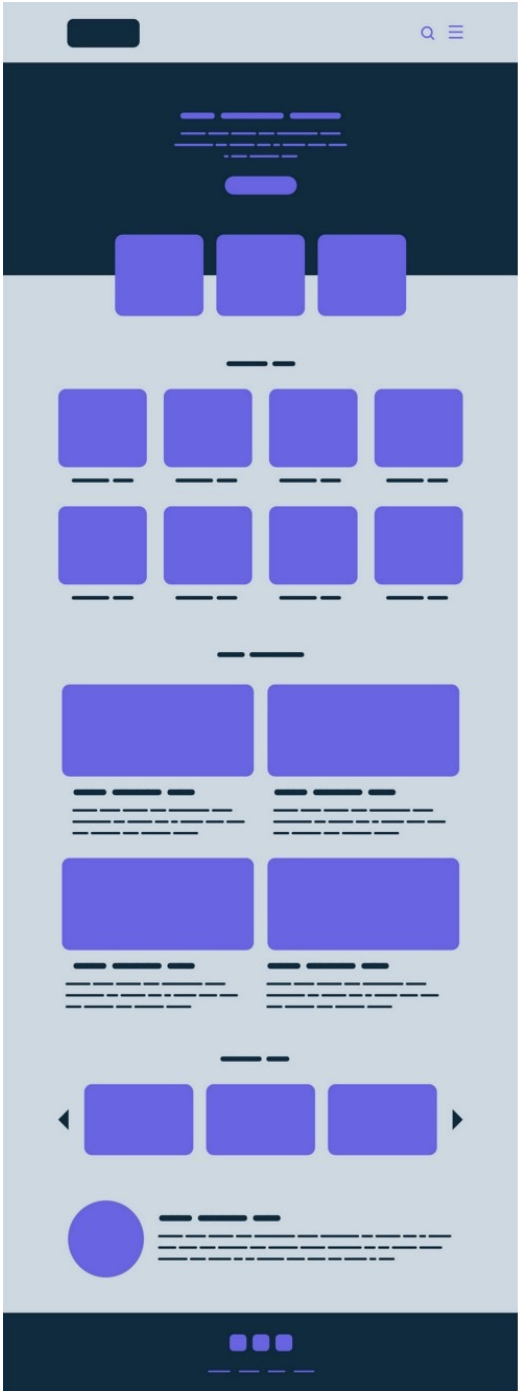
# Law of promixity

Objects that **are closer together are perceived as more related** than objects that are further apart

When we perceive a collection of objects, we will see objects **close to each other as forming a group.**



Abbildung 3.28: Objekte, die nahe beieinander liegen, werden gruppiert.



**1. Tell us about yourself...**

My Name

Gender

Birthday

I live in

Postal Code

**2. Select an ID and password**

Yahoo! ID and Email  @

Password  Password Strength

Re-type Password

**3. In case you forget your ID or password...**

Alternate Email

1.Security Question

Your Answer

2.Security Question

Your Answer

Figure: Proximity in a Web form

# Law of promixity

**Proximity** is a concept close to with **Fitts' law**. Atwood (2010) explains that, in its simplest form, this rule reflects common sense, that the ***larger and closer an object is***, the easier it is to reach it.

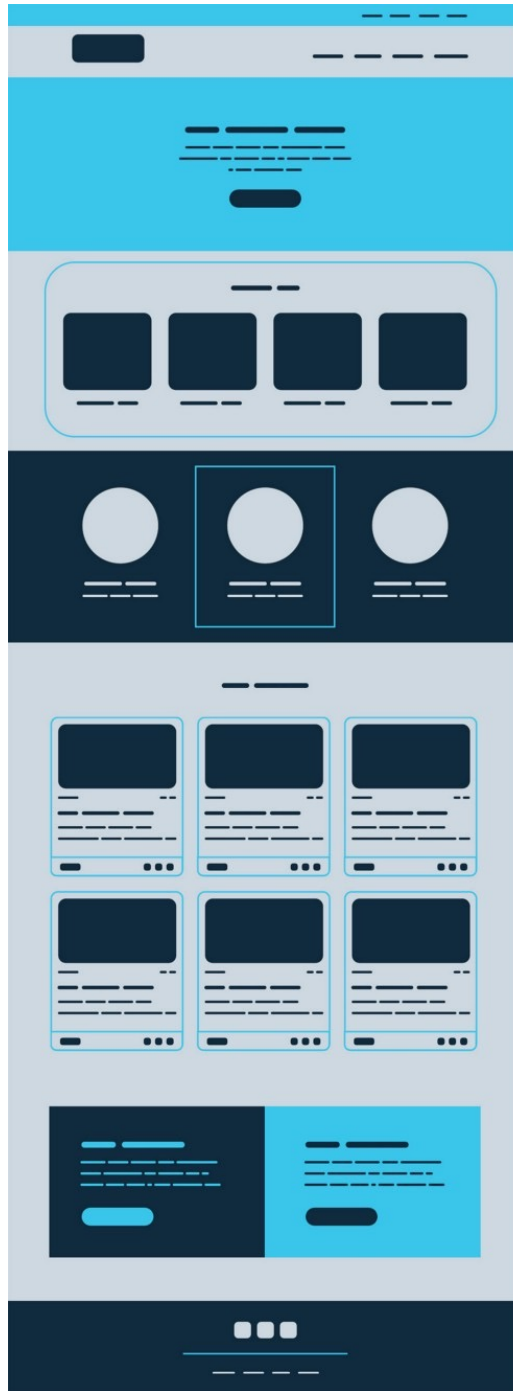
It was hypothesized by Fitts (1954) based around a mathematical equation that is used to illustrate the time required to reach a target object.

The fundamental idea is that the faster you can reach your goal, the more you increase efficiency and ease of use.

# Common region

Common region: as in proximity, the elements that are inserted in the **same region are perceived as grouped** (Gkogka, 2018).

This principle is particularly useful for organizing information and content, but also serve as focal point: it increase the visual hierarchy, and promotes the dissemination of information.



# Law of Prägnanz (figure-ground)

People will perceive and interpret ambiguous or complex images as the **simplest form(s) possible.**

In perceiving a visual field, **some objects take a prominent role** (the figures) while others recede into the background (the ground). The visual field is thus divided into these two basic parts. Elements are perceived as either **figure** (the element in focus) or **ground** (the background on which the figure rests) → **figure/ground**

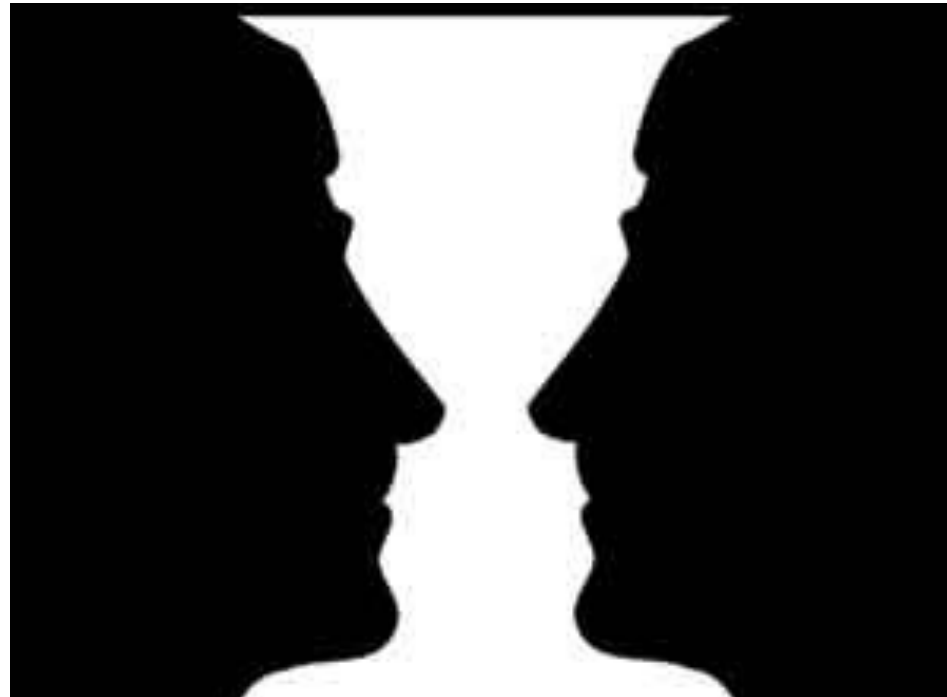






Figure: A local news site. The right side of the screen is filled with advertisements, which users learned to 'ban to the background'. The news pictures (right below) are likely to be seen as ads as well.

# Law of symmetry

[       ] [       ] [       ]

People tend to perceive objects as **symmetrical shapes that form around their center.**

Most objects can be divided in two more or less symmetrical halves. When we see two **unconnected elements that are symmetrical**, we unconsciously **integrate them into one coherent object** (or percept).

The more alike objects are, the more they tend to be grouped.

# Law of symmetry

[        ] [        ] [        ]

A typical textbook example consists of a configuration of a number of brackets.

When perceiving the configuration, we see three pairs of **symmetrical brackets** as opposed to **6 individual brackets**, or two pairs and two singles.

This happens despite what is suggested by some of the brackets immediate proximity to each other.

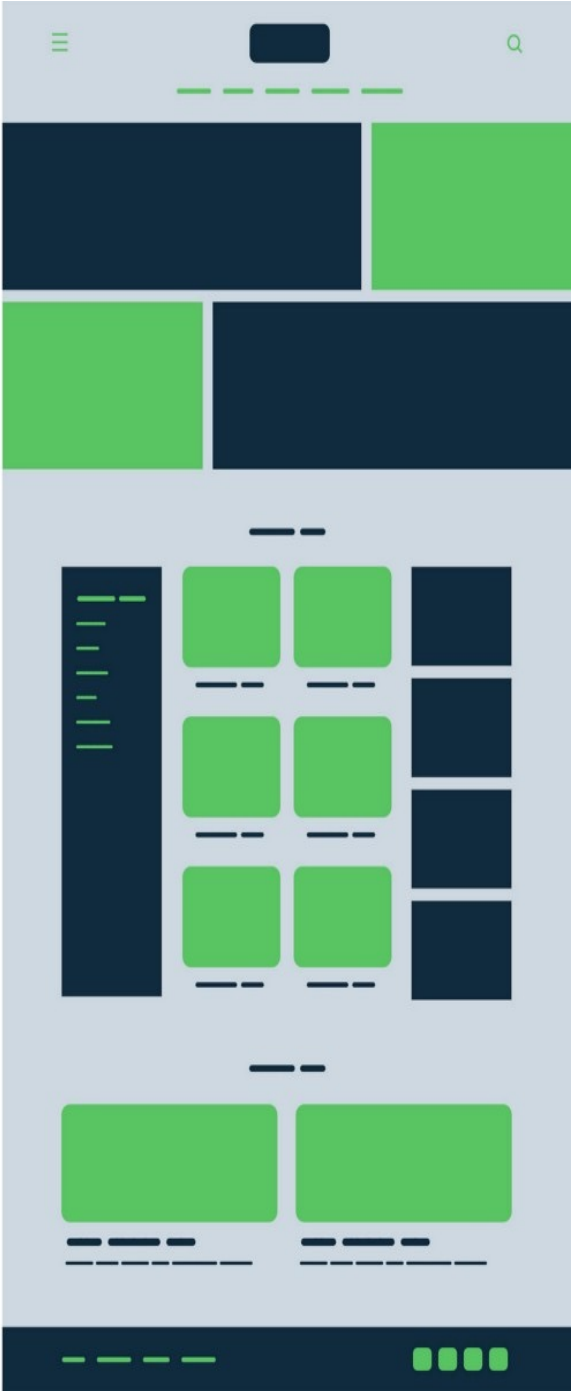
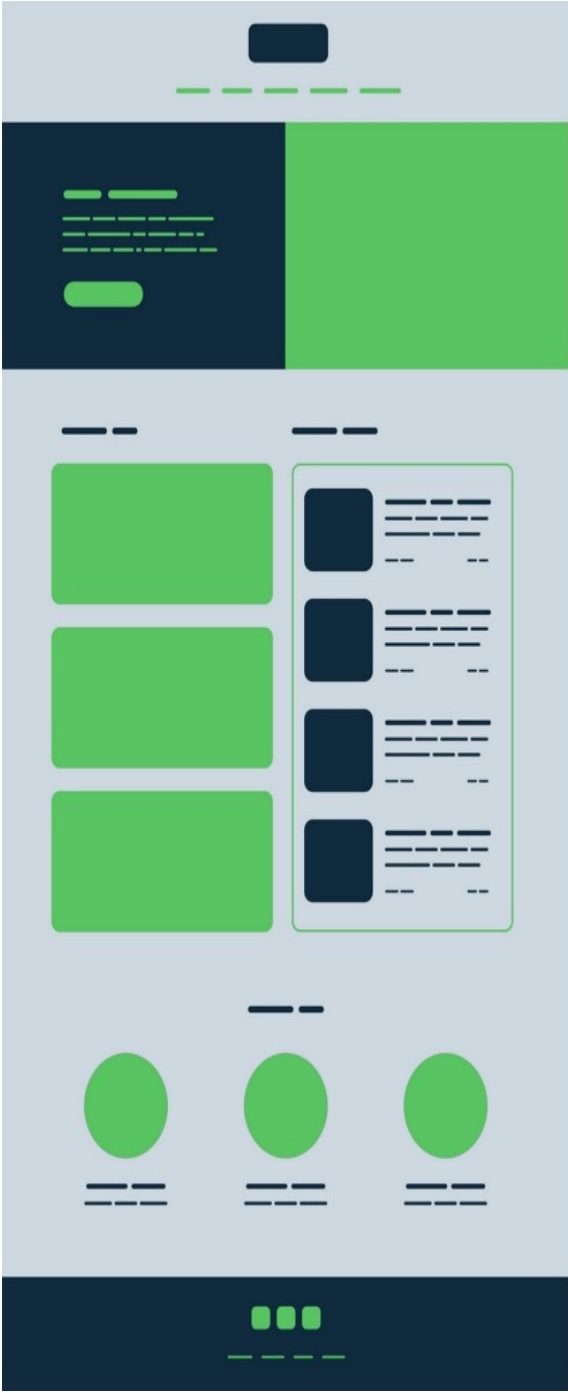
WHAT WE DO  
WHAT WE'VE DONE  
WHAT WE'RE DOING

✦ THE OFFICES OF ✦  
**SAM T. SCHICK**  
✦ THE WANDERING WORKS ✦  
DESIGN CO.

WHO WE ARE  
HOW TO HIRE US  
HOW TO WORK FOR US



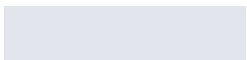
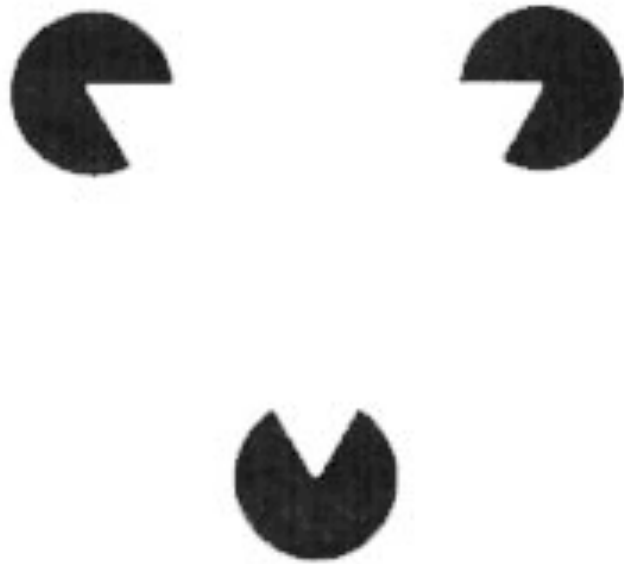
**WE CAN HELP YOU TELL  
A BETTER STORY.**



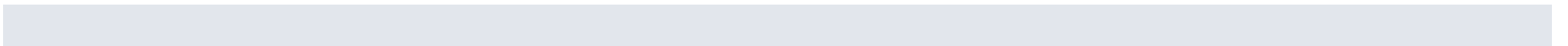
# Law of closure

When seeing a complex arrangement of elements, we **tend to look for a single, recognizable pattern**

We **perceptually close up**, or complete, objects that are not, in fact, complete.



# Law of closure



# SHAKED AMER IONS



Conseil en système  
d'information et système



# Law of Continuity

Elements arranged on a line or **curve** are **perceived as more related** than elements not on the line or curve.

The mind continues visual, auditory and kinetic patterns.



Abbildung 3.31: Objekte, die sich auf einer Linie befinden, werden gruppiert.

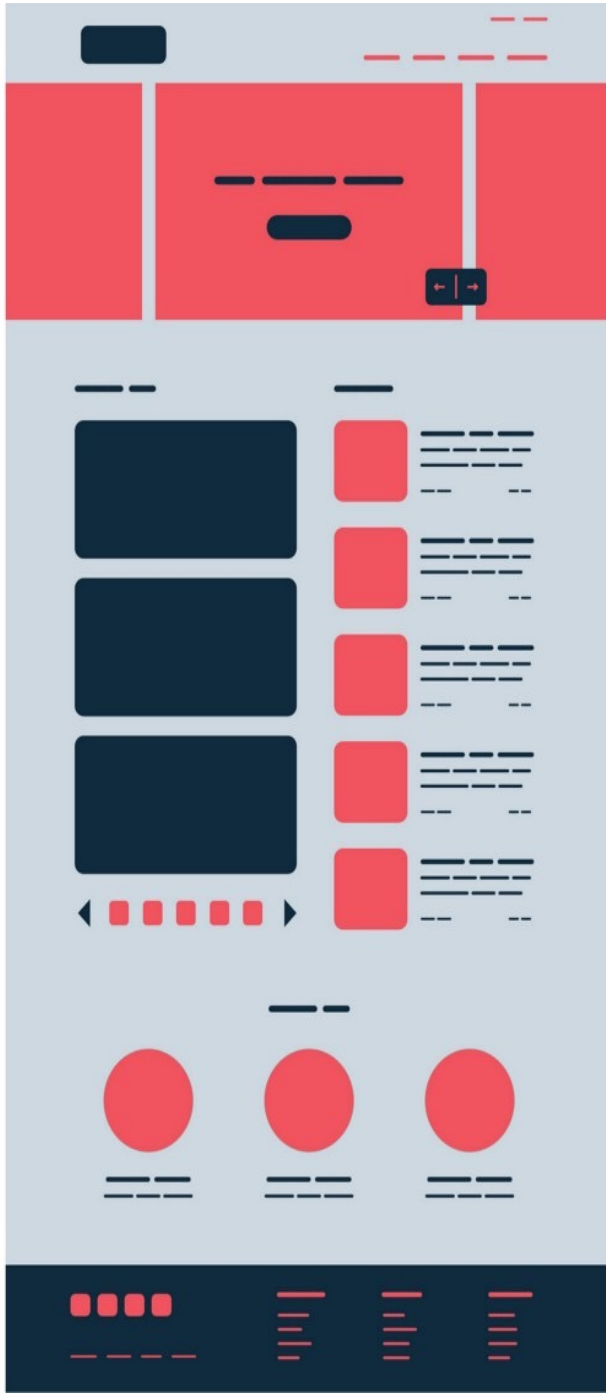
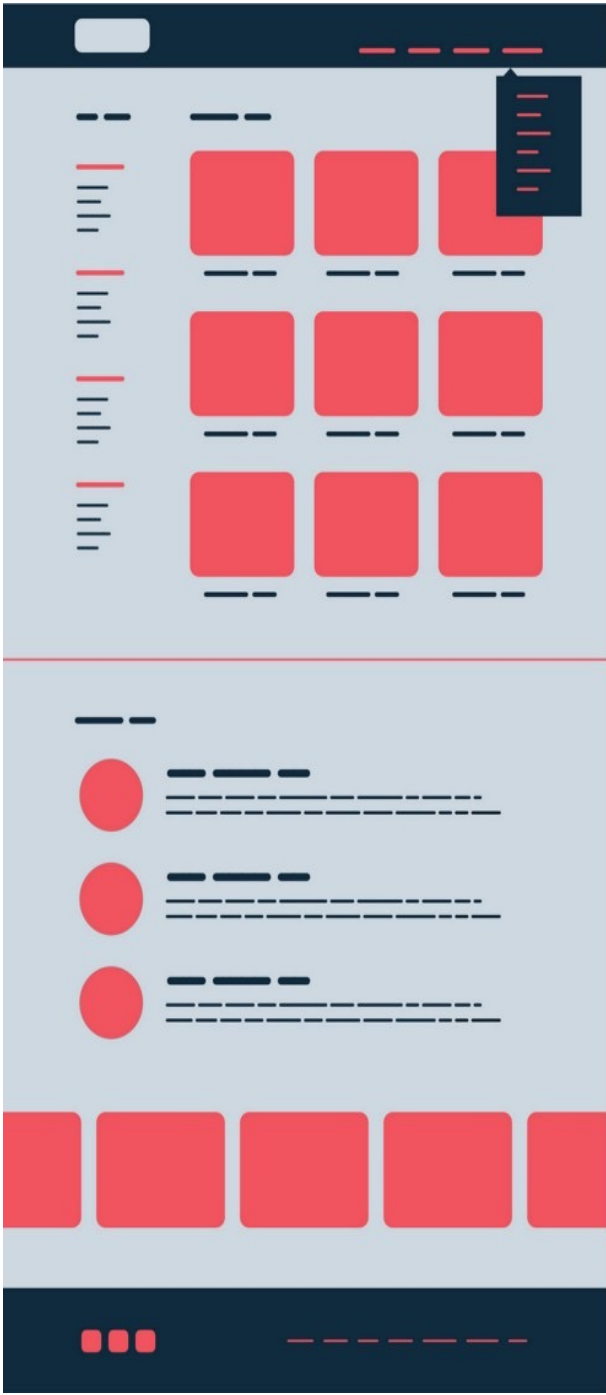
Im Rampenlicht

# uberragend

Uberspace.de ist deine Plattform für den Betrieb von Websites und Mail. Sie bietet ungewöhnlich viele Möglichkeiten und ein innovatives Preismodell.

// zum Projekt





## Familiarity (past experience)

Figures that once **have been recognized as a familiar**, well-known form or figure, are from this time on an **associated figure**. It becomes then difficult to deconstruct the single parts.

As we attempt to **match** what we see **to the familiar patterns we have stored in memory**, there isn't always an exact match.

Instead we find a near match and then fill in the gaps of what we think we should see.



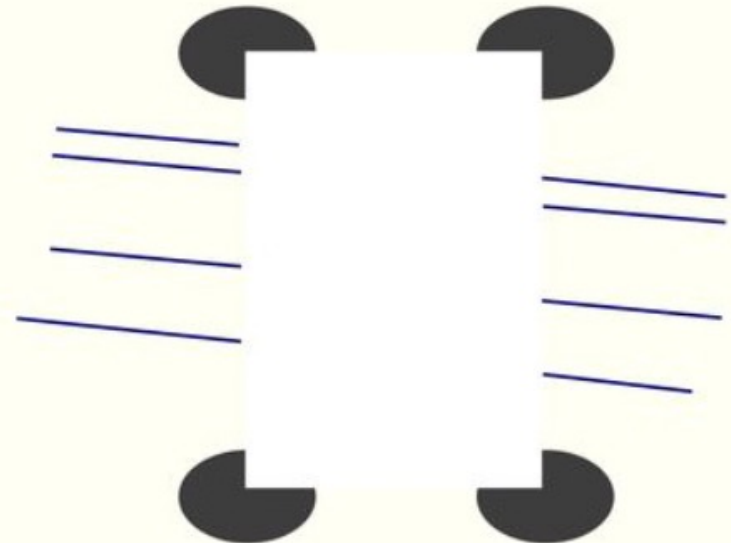
Example of Familiarity

## Eight Gestalt Laws of Perceptual Organization

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### 7. Law of familiarity (or meaningfulness) –

“Things are more likely to form groups if the groups appear familiar or meaningful”



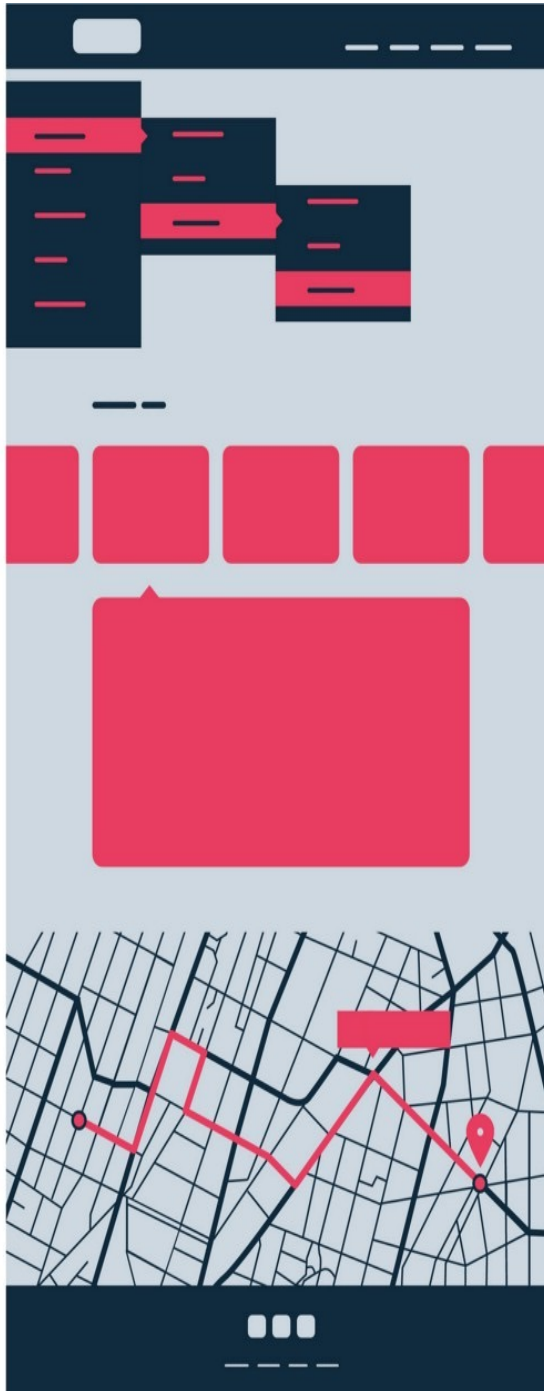
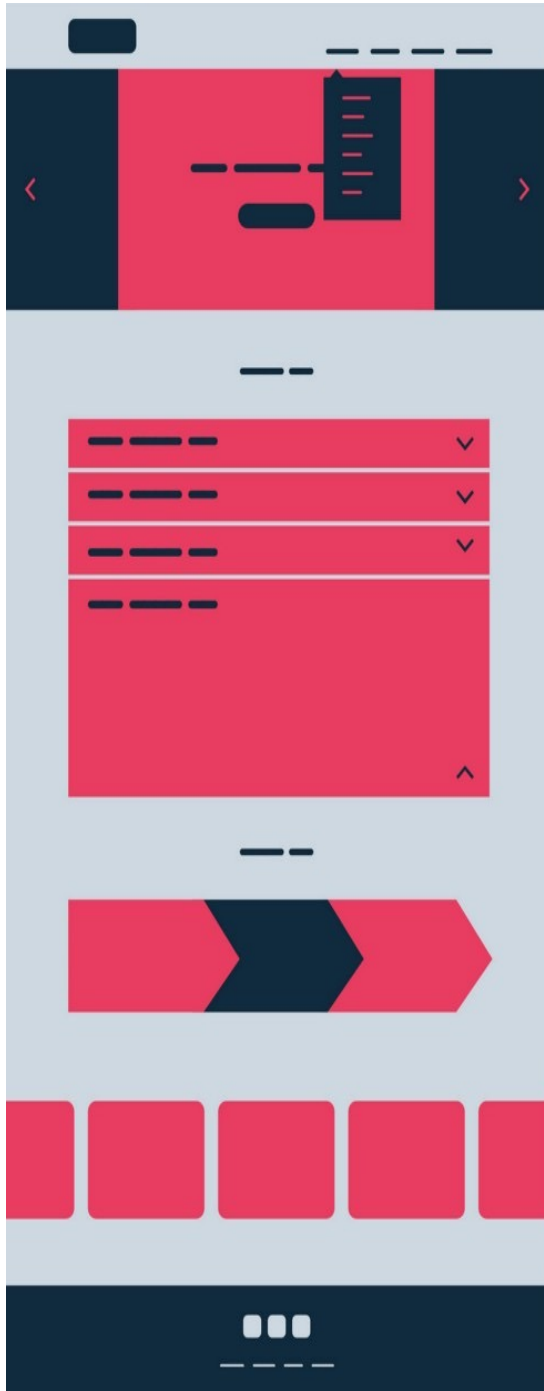
<https://slideplayer.com/slide/12494375/>

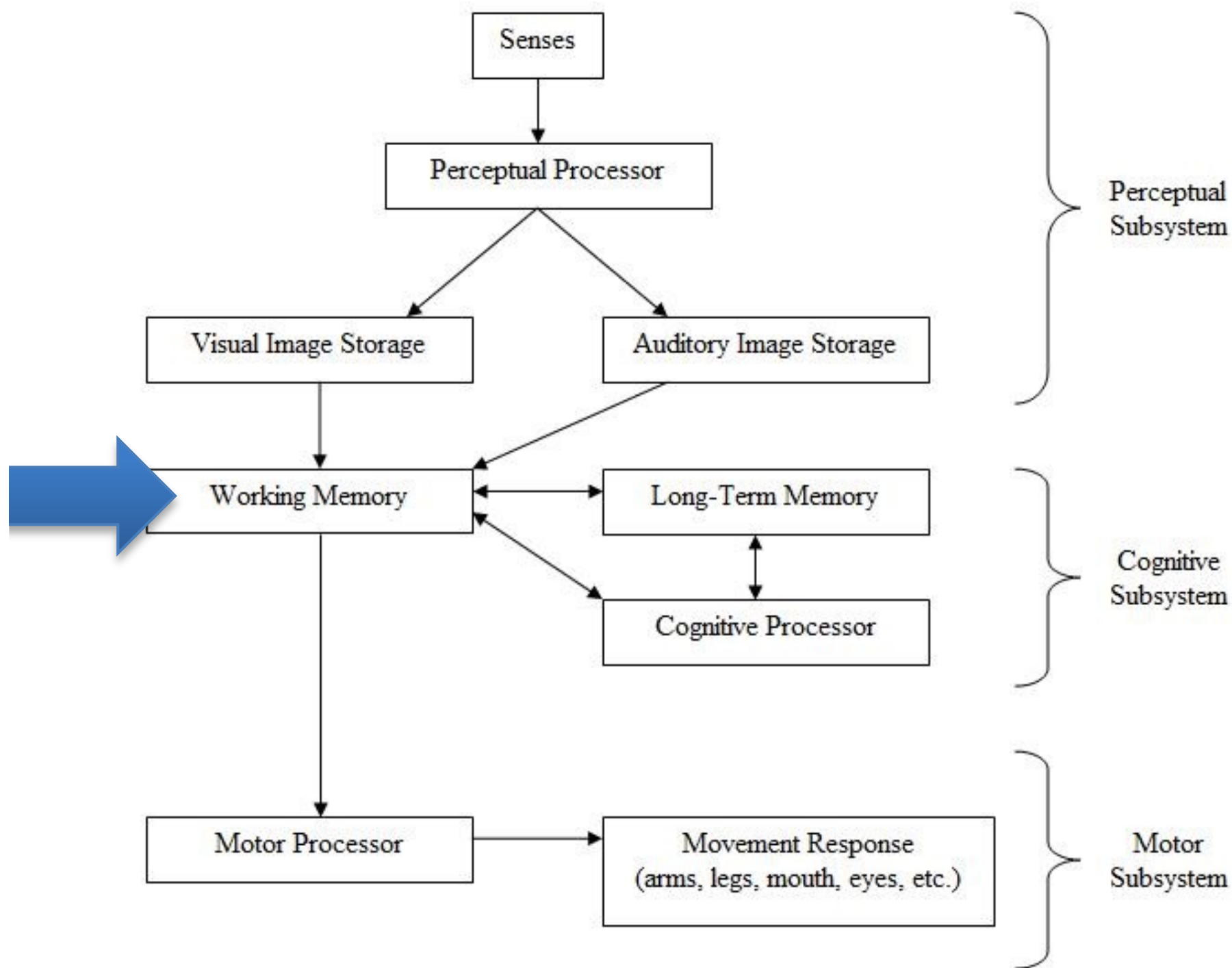
# Common Fate

The Gestalt law of common fate states that humans perceive visual **elements that move in the same speed and/or direction as parts of a single stimulus.**

A common example of this is a flock of birds. ... Birds that fly in a different direction do not appear to be included in the same group.

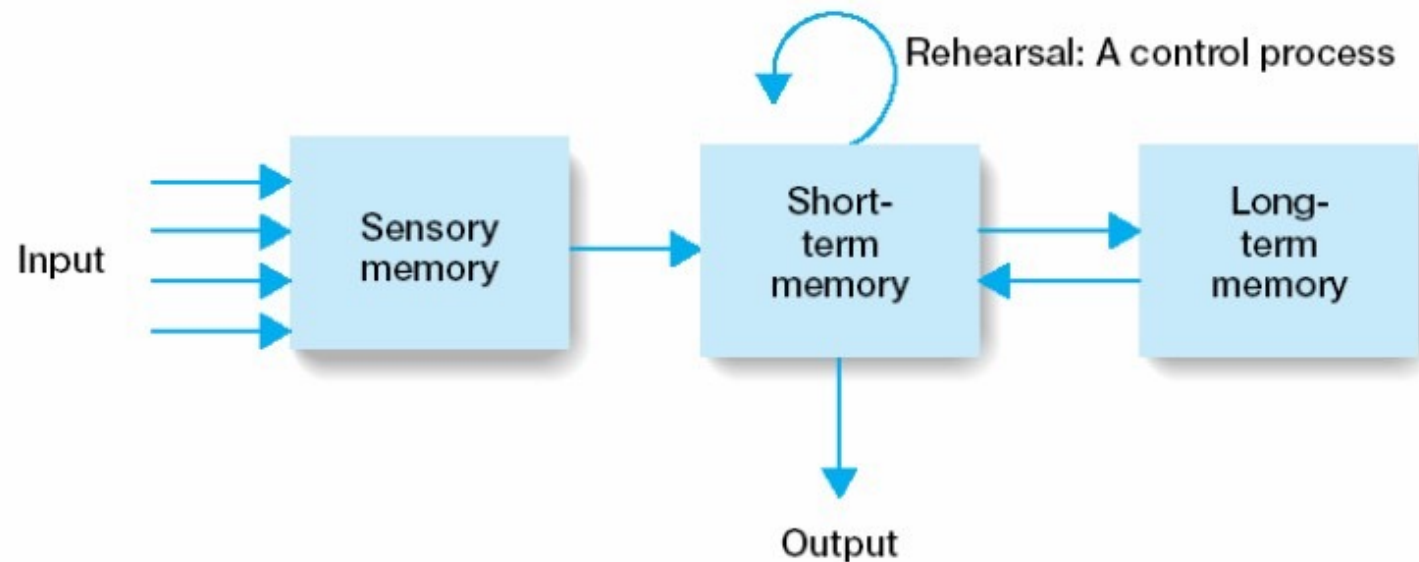








# Cognition: Human Memory



**Sensory memory** acts as a **buffer for stimuli** received through the senses (visual, aural, touch). These memories are constantly overwritten by new information coming in.

*For example, in fireworks displays, moving sparklers leave a persistent image.*

**Short-term memory** acts as a 'scratch pad' for temporary recall of information. It is used to store information which is only required fleetingly. Short-term memory can be **accessed rapidly** and also decays rapidly.

**Long-term memory** is our **mean resource** for factual information, experiential knowledge, rules of behavior, . . . .

- e *Episodic* memory represents our memory of events and experiences
- e *semantic* memory is structured in some way to allow access to information, representation of relationships between pieces of information, and inference.

Memory involves **encoding** and **recalling** knowledge and acting appropriately

- e We **don't remember everything** - memorizing involves filtering and processing
- e **Context** is important in **affecting our memory**
- e We **recognize** things **much better** than being able to **recall** things (which explains the rise of the GUI over command-based interfaces)
- e We are better at **remembering images than words** (which is why we use of icons rather than names)

# Misconceptions about memory

There are many misconceptions about human memory and the implications for interface design.

Before we continue, try to memorize the following:

393332389481

# Misconceptions about memory

There are many misconceptions about human memory and the implications for interface design.

Before we continue, try to memorize the following:

393332389481

It is easier like this

39 333 23 89 481

# The problem with the classic “7 +/- 2”

- George Miller’s theory of **how much** information people can remember
- People’s **immediate memory capacity** is very limited
- .. In general, **one can remember 5-9 chunks** - and chunks can be letters, numbers, words, sentences, images, . . .

Many designers have been led to believe that this is a useful finding for interaction design:

- Present only 7 options on a menu
- Display only 7 icons on a tool bar
- Have no more than 7 bullets in a list
- Place only 7 items on a pull down menu
- Place only 7 tabs on the top of a website page

But this is wrong. Why?

- ⌚ People can scan lists of bullets, tabs, menu items till they see the one they want
- ⌚ They don't have to recall them from memory having only briefly heard or seen them

# Mental models

Users develop an understanding of a system through learning and using it

Knowledge is often described as a mental model

- How to use the system

- What to do with unfamiliar systems or unexpected situations

People make inferences using mental models of how to carry out tasks

The mental models guide our actions

- Ideally the conceptual model of the application and the user mental model should coincide → interaction with the system should be easy and intuitive



# Mental models

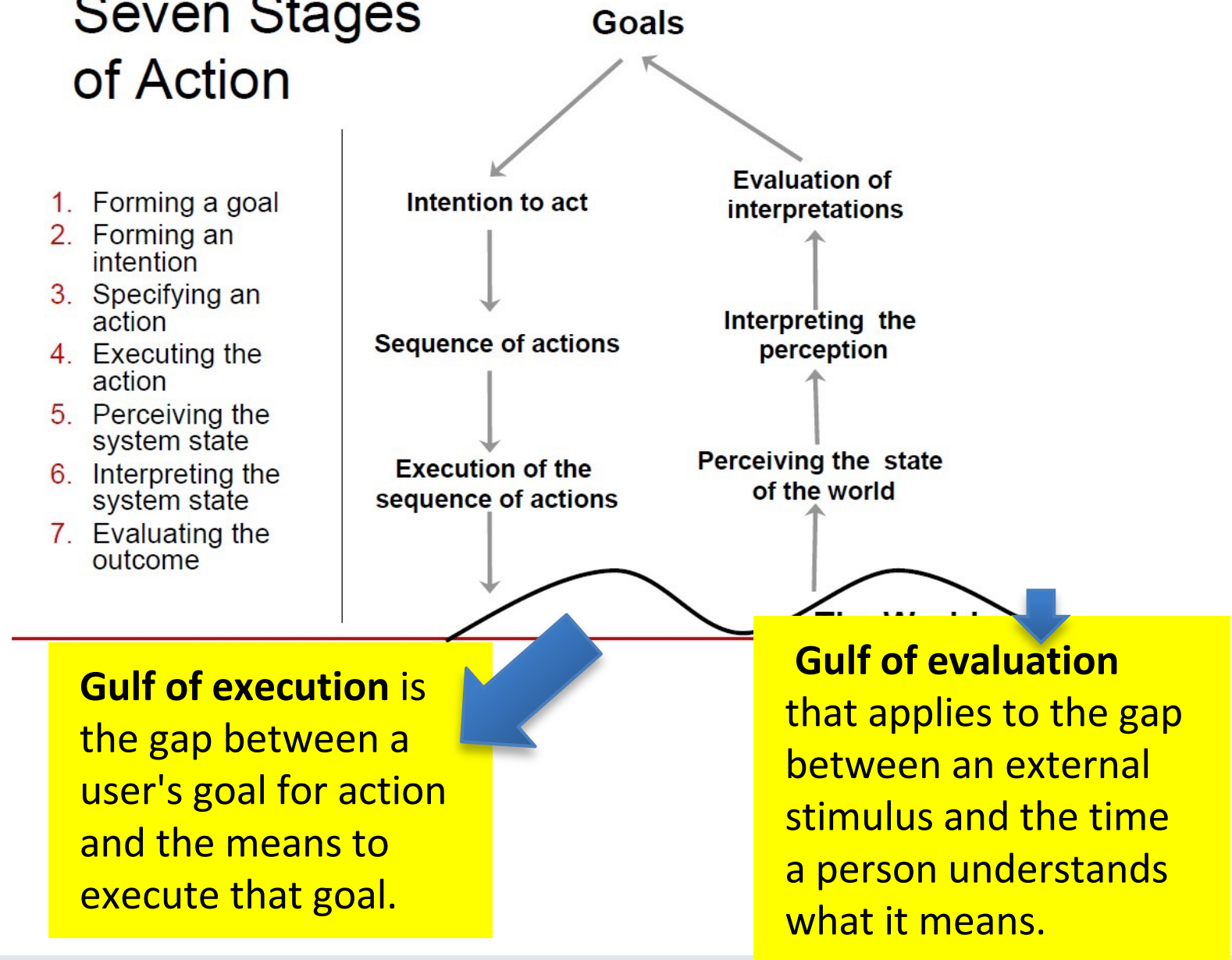
Craik (1943) described mental models as internal constructions of some aspect of the external world enabling predictions to be made

Involves unconscious and conscious processes, where images and analogies are activated

# Action and Interaction (Normann, 1986)

## Seven Stages of Action

1. Forming a goal
2. Forming an intention
3. Specifying an action
4. Executing the action
5. Perceiving the system state
6. Interpreting the system state
7. Evaluating the outcome



# Stages of action models

(i) Set goal to find out about breaking news

decide on news website

(ii) Form an intention

check out BBC website

(iii) Specify what to do

move cursor to link on browser

(iv) Execute action sequence

click on mouse button

(v) Check what happens at the interface

see a new page pop up on the screen

(vi) Interpret it

read that it is the BBC website

(vii) Evaluate it with respect to the goal

read breaking news

# The gulfs

The 'gulfs' explicate the gaps that exist between the user and the interface

The gulf of execution

the distance from the user to the physical system

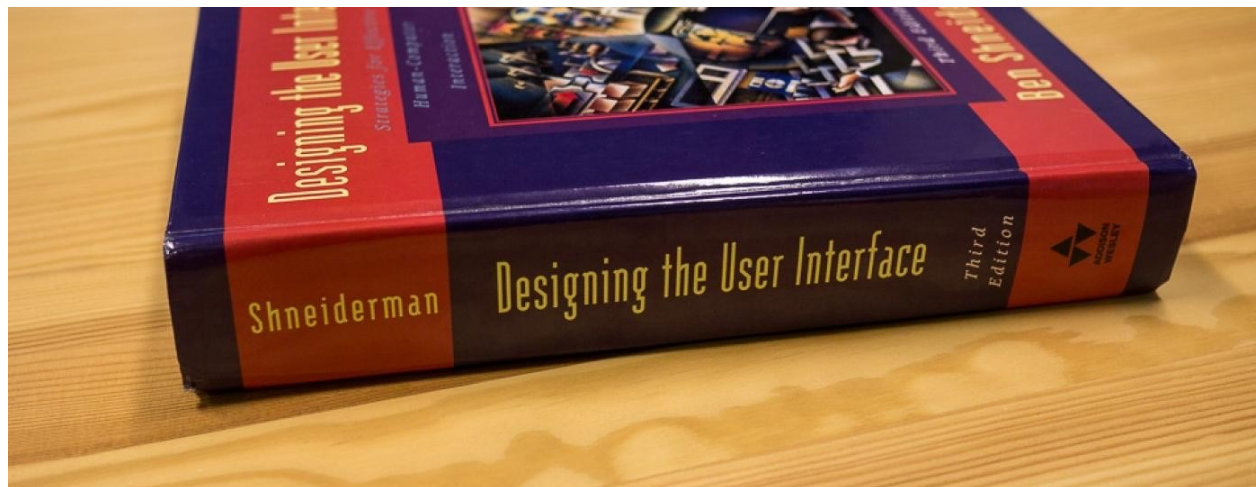
The gulf of evaluation

the distance from the physical system to the user

Need to bridge the gulfs in order to reduce the cognitive effort required to perform a task

# The Eight Golden Rules of interface design

As stated by Ben Shneiderman, Professor of the Human-Computer Interaction Lab of the University of Maryland.



<https://www.interaction-design.org/literature/article/shneiderman-s-eight-golden-rules-will-help-you-design-better-interfaces>

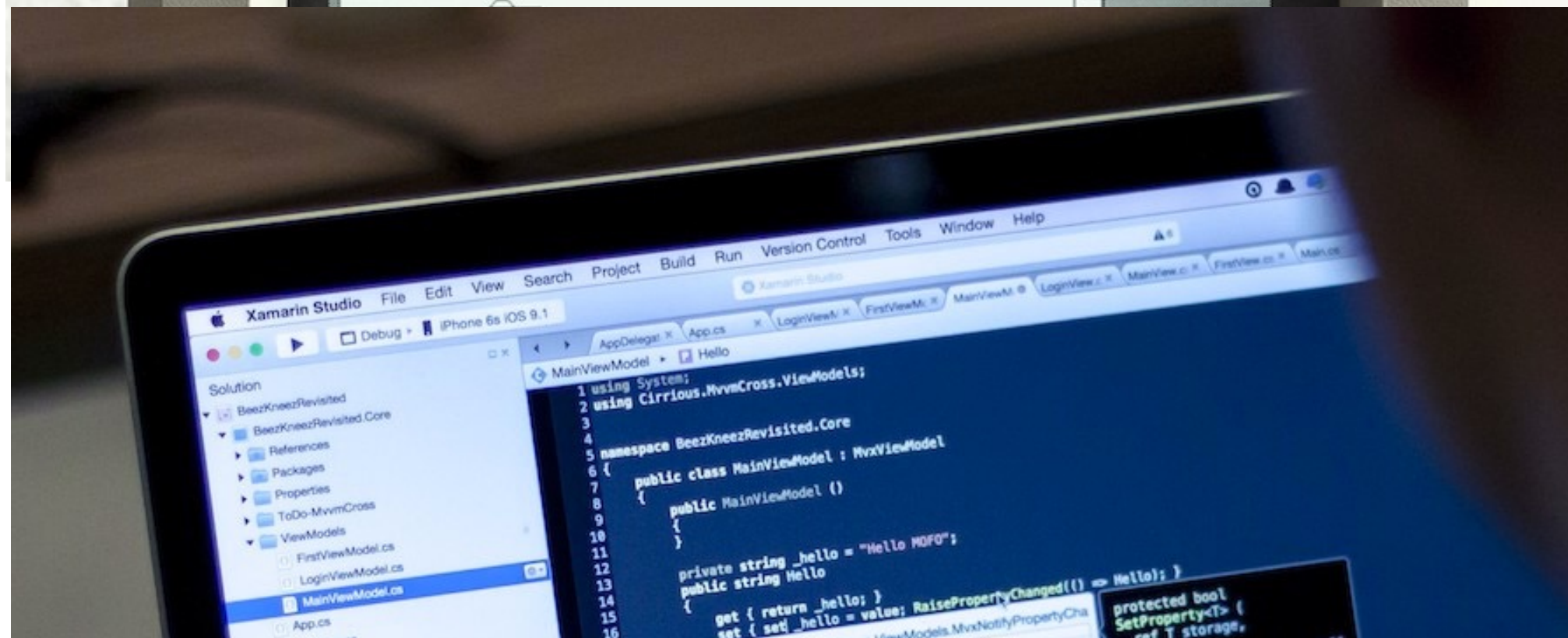
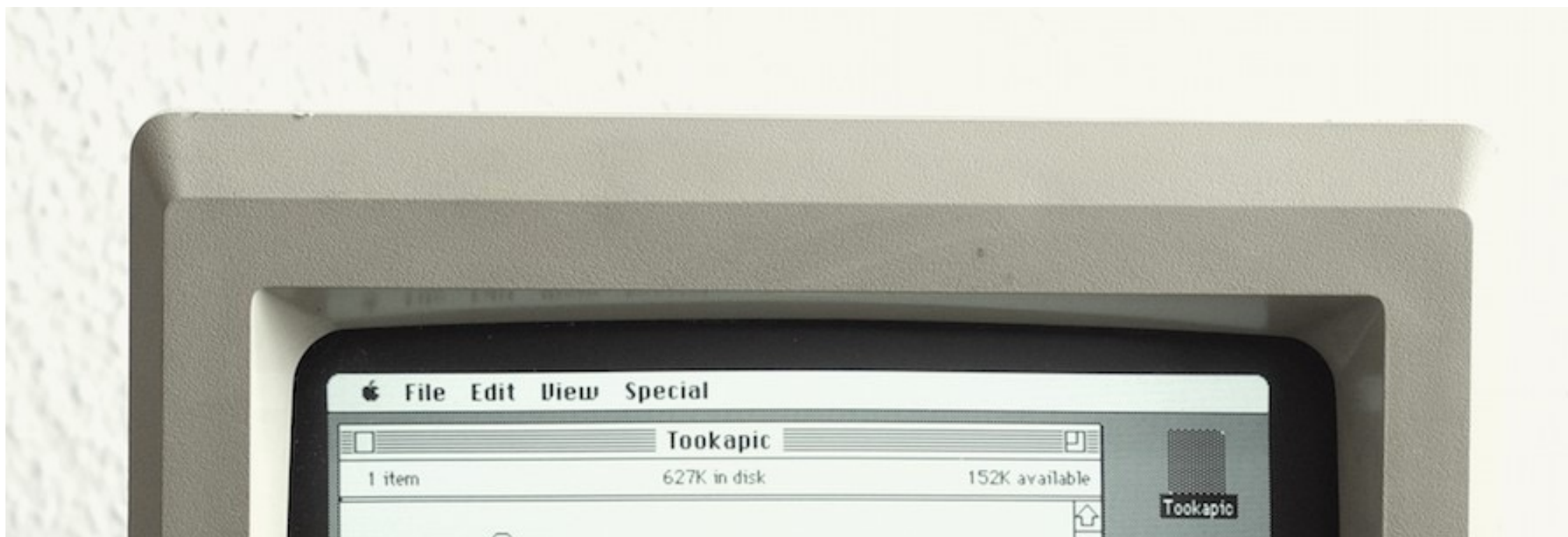
# 1. Strive for consistency

**Standardizing** the way information is conveyed ensures users are able **to apply knowledge** from one click to another; without the need to learn **new representations** for the same actions.

- e consistent **sequences of actions** in similar situations
- e **identical terminology** in prompts, menus and help screens
- e **consistent** color, layout, capitalization, fonts, . . .
- e **exceptions** should be **comprehensible** and **limited** in number

In the WWW it gets pretty hard:

- e No real guidelines and no authority
- e How are links represented?
- e Where is the navigation?
- e Styles and 'fashion' change quickly



## 2. Enable frequent users to use shortcuts

With **increased use** comes the demand for **quicker methods** of **completing tasks**.

**Recognize** the **needs** of **diverse users** and design for **both novices** and **experts**; different age ranges and background knowledge; technological diversity. **Cater to universal usability**

Example: shortcuts on different levels

- e Access to single commands, e.g. keyboard shortcuts (CTRL+S) or toolbar
- e Customizing of commands and environments, e.g. printer presets (duplex, A4, color or greyscale)
- e Reusing actions performed, e.g. history in command lines, macro functionality





### 3. Offer informative feedback

The user should know **where they are** at and **what is going on at all times**. For every action there should be appropriate, human-readable **feedback** within a reasonable amount of time.

- e For **every user action**, there should be **system feedback**
- e For **frequent** and **minor** actions, the **response can be modest**



Finder

File

Edit

View

Go

Window

Help



Learning



My Photos

photo1.jpg



photo1.jpg



Projects



## 4. Design dialogs to yield closure

Don't keep your **users guessing**. Tell them **what their action has led them to**.

- Sequences of actions should be **organized** into **groups** with a **beginning, middle** and **end**
- **Informative feedback** at the completion of **a group of actions** informs users about the accomplishment of a task
- For example: e-commerce sites move users to the checkout, ending with a clear confirmation page that completes the transaction

[Home](#)[Browse Our Products](#)[Special Offers](#)[PRE-OWNED](#)Search for: [Advanced search](#)In: [All](#)[Home](#) > [Checkout](#) > **Basket**

## 5. Offer simple error handling

Systems should be designed to be as **fool-proof as possible**, but when unavoidable errors occur, **ensure users are provided with simple, intuitive step-by-step instructions** to solve the problem as quickly and painlessly as possible

- e Design the system such that users cannot make serious errors
- e If a user makes an error, the interface should offer constructive and specific instructions for recovery

The screenshot shows a web form for creating a new Yahoo! ID. The form is titled "ID and password" in purple. The "ID and Email" section has a text input field containing "brujo", a dropdown menu showing "@ yahoo.com", and a "Check" button. To the right of the "Check" button, a red arrow points left with the text "This ID is not available". Below this, a yellow box with a speech bubble icon contains suggestions: "Here are some suggestions..." followed by a list: "1. brujo51@yahoo.com", "2. brujo757@yahoo.com", and "3. brujo451@yahoo.com". Below the suggestions, it says "New Yahoo IDs" followed by a list: "1. brujo36@rocketmail.com" and "2. brujo14@ymail.com". The "Password" section has a text input field with a red triangle icon and the word "Password" in red. To the right of the password field, a red arrow points left with the text "Use 6 to 32 characters". Below the password field, there is a "Too short" label and a progress bar with four segments, the first of which is red. At the bottom, a note says "Capitalization matters. Use 6 to 32 characters, and don't use your name or".

ID and password

! ID and Email brujo @ yahoo.com Check This ID is not available

Here are some suggestions...

1. brujo51@yahoo.com
2. brujo757@yahoo.com
3. brujo451@yahoo.com

New Yahoo IDs

1. brujo36@rocketmail.com
2. brujo14@ymail.com

! Password Too short Use 6 to 32 characters

Capitalization matters. Use 6 to 32 characters, and don't use your name or

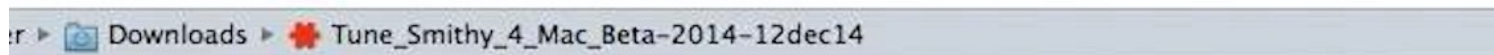
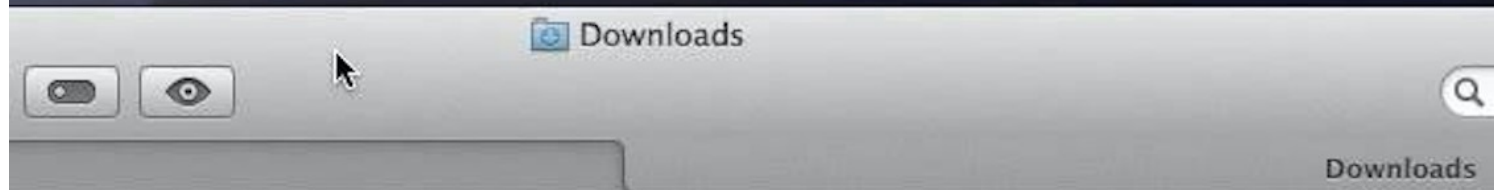
## Windows

A fatal exception 0E has occurred at 0028:C0011E36 in UXD UMM(01) + 00010E36. The current application will be terminated.

- \* Press any key to terminate the current application.
- \* Press CTRL+ALT+DEL again to restart your computer. You will lose any unsaved information in all applications.

Press any key to continue \_



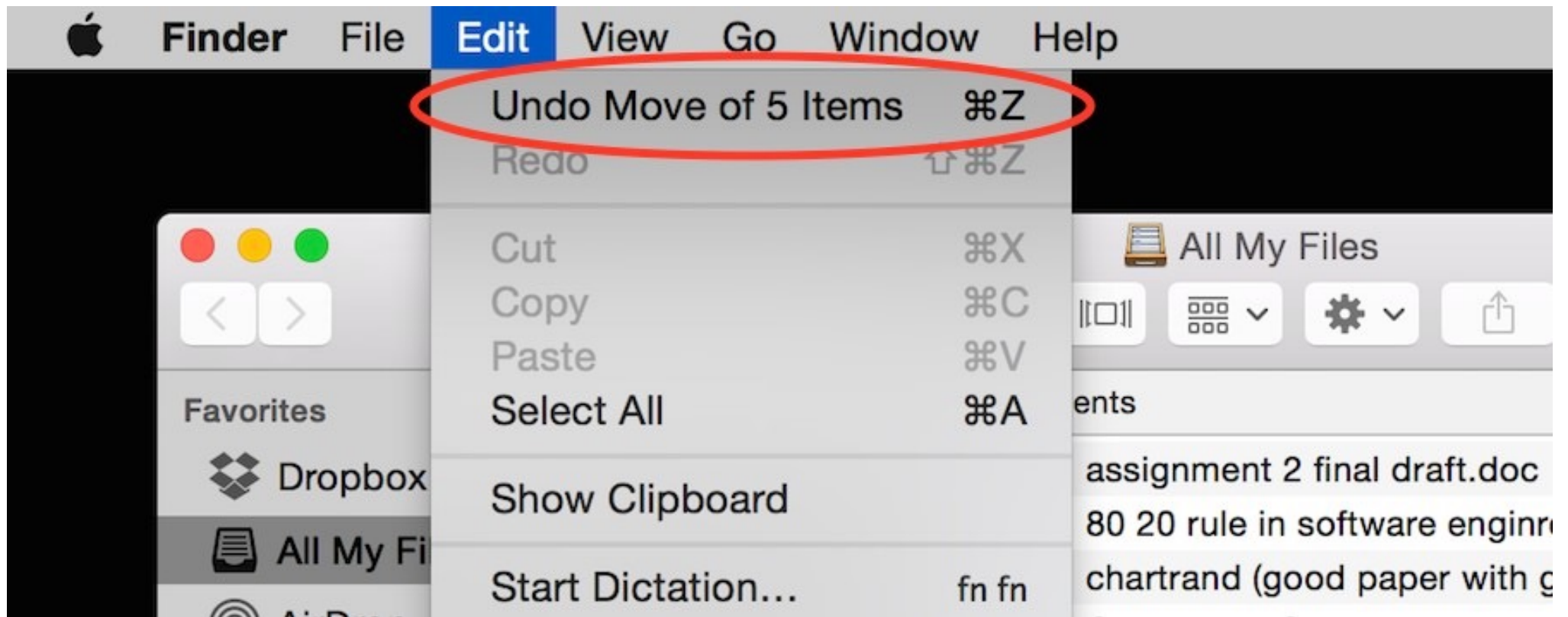




## 6. Permit easy reversal of actions

Designers should aim to offer users **obvious ways to reverse their actions**. These reversals should be permitted at **various points whether it occurs** after a single action, a data entry or a whole sequence of actions.

The units of reversibility may be a single action, a data-entry task, or a complete group of actions.



## 7. Support internal locus of control

Allow your **users to be the initiators of actions**. Give users the sense that they are in **full control of events** occurring in the digital space. Earn their trust as you design the system to **behave as they expect**.

Users strongly desire to be in control of the interface. They do not want surprises or changes in familiar behavior.

This is an important lesson learned by the designers of Microsoft, who introduced **personalized menus** in Office 2003.

The problem with these menus was that they changed continuously and that users needed to read each single item (instead of picking item 5 or something).

After massive criticism, Microsoft disabled the personalized menus in the default settings.

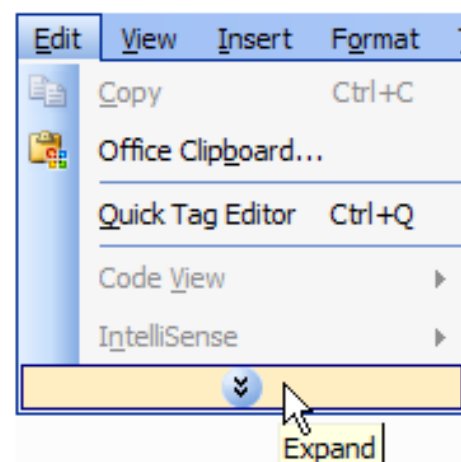
This means that, at least for the time being, menus and toolbars are still alive as a part of many important programs, such as Publisher, Project, Visio, and several others.

The good news for fans of usability worldwide is that an historical moment is upon us. As of Tuesday, we have officially flipped the switch to turn off Personalized Menus by default for all apps in all future builds of Office 12. *(New UI programs based on the Ribbon, of course, were designed without Personalized Menus from the beginning.)*

Don't know what Personalized Menus are? You can [read all about them in Part 3 of the "Why The UI?" series](#), including my take about why they weren't a good idea.

The option isn't going away, so if you do love this feature for some reason, you can still manually turn it on in Office 12. But the default setting for "Always show full menus" will be set to on, reversing the default first introduced in Office 2000.

A small but significant victory for humankind.



*Fare thee well, Personalized Menus, an experiment whose time has passed...*

## 8. Reduce short-term memory load

Human attention is **limited** and we are only capable of maintaining around **seven items in our short-term memory at one time**.

Therefore, interfaces should be as simple as possible with proper information hierarchy, and **choosing recognition over recall**.

Recognizing something is always easier than recall because recognition involves perceiving cues that help us reach into our vast memory and allowing relevant information to surface (Recognition over recall is one of Nielsen's ten usability heuristics for interface design).

Avoid interfaces in which users must remember information from one screen and then use that information on another screen.



# ios 4