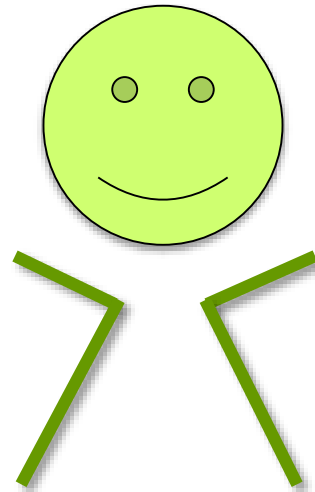




# Human-Computer Interaction

## an overview



“Design, v.: What you regret not doing later on.”

***/usr/games/fortune***

How about the interaction(s)  
between user(s) and software?



# Human

a person who tries to accomplish a goal



# Computer

runs applications (software)

# Computer

runs applications (software)

locally *versus* remotely



first game developed on PDP (1960s)













28 eggs  
3:47 pm

11 eggs  
3:48 pm

24 egg  
3:48 pm





28 eggs  
3:47 pm

# Interaction

“dialogue” between humans and computers

# interaction

/ɪntər'ækʃ(ə)n/ 

*noun*

noun: **interaction**; plural noun: **interactions**

reciprocal action or influence.

"ongoing interaction between the two languages"

- **PHYSICS**

a particular way in which matter, fields, and atomic and subatomic particles affect one another, e.g. through gravitation or electromagnetism.

---

Translate interaction to



*noun*

1. interacțiune
2. acțiune reciprocă
3. influență reciprocă



The interaction between user(s) and application(s)  
is achieved via an interface – **user interface**

The interaction between user(s) and application(s) is achieved via an interface – **user interface**

API (Application Programming Interface)  
*versus*  
UI (User Interface)

# Types of user interfaces:

**conventional (classical) UI** – *e.g.*, desktop



**Graficon (Douglas Engelbart, 1963)**

## Types of user interfaces:

**conventional (classical) UI** – *e.g.*, desktop

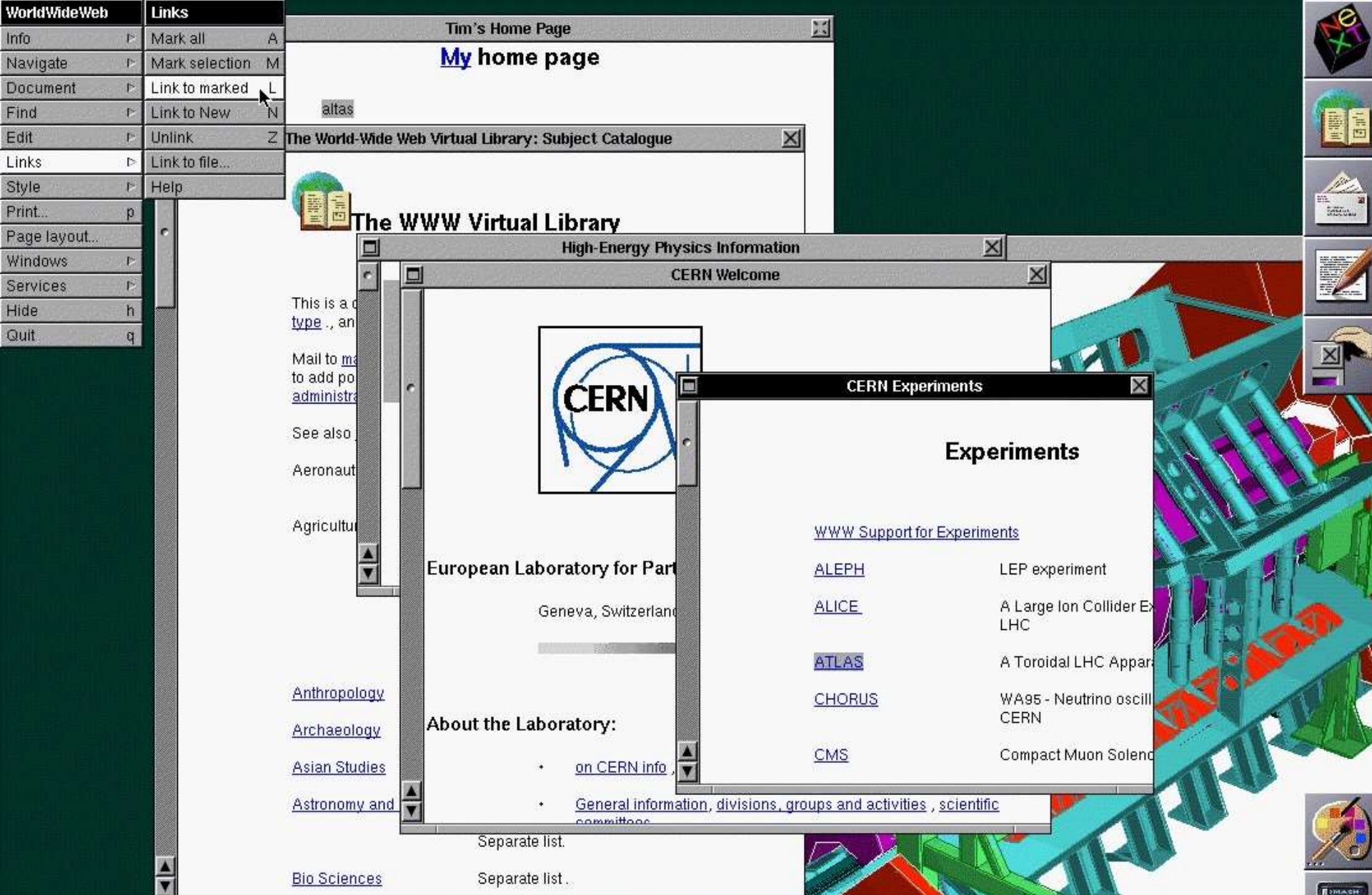
WIMP (Window Icon Menu Pointer) paradigm  
interaction via keyboard & mouse + additional devices  
graphical representations (bitmap *vs.* vectors)  
support provided by the OS kernel *vs.* a desktop system  
multi-tasking



**Bryce (Kai Krause, 1997)**

# Types of user interfaces:

**Web interface**



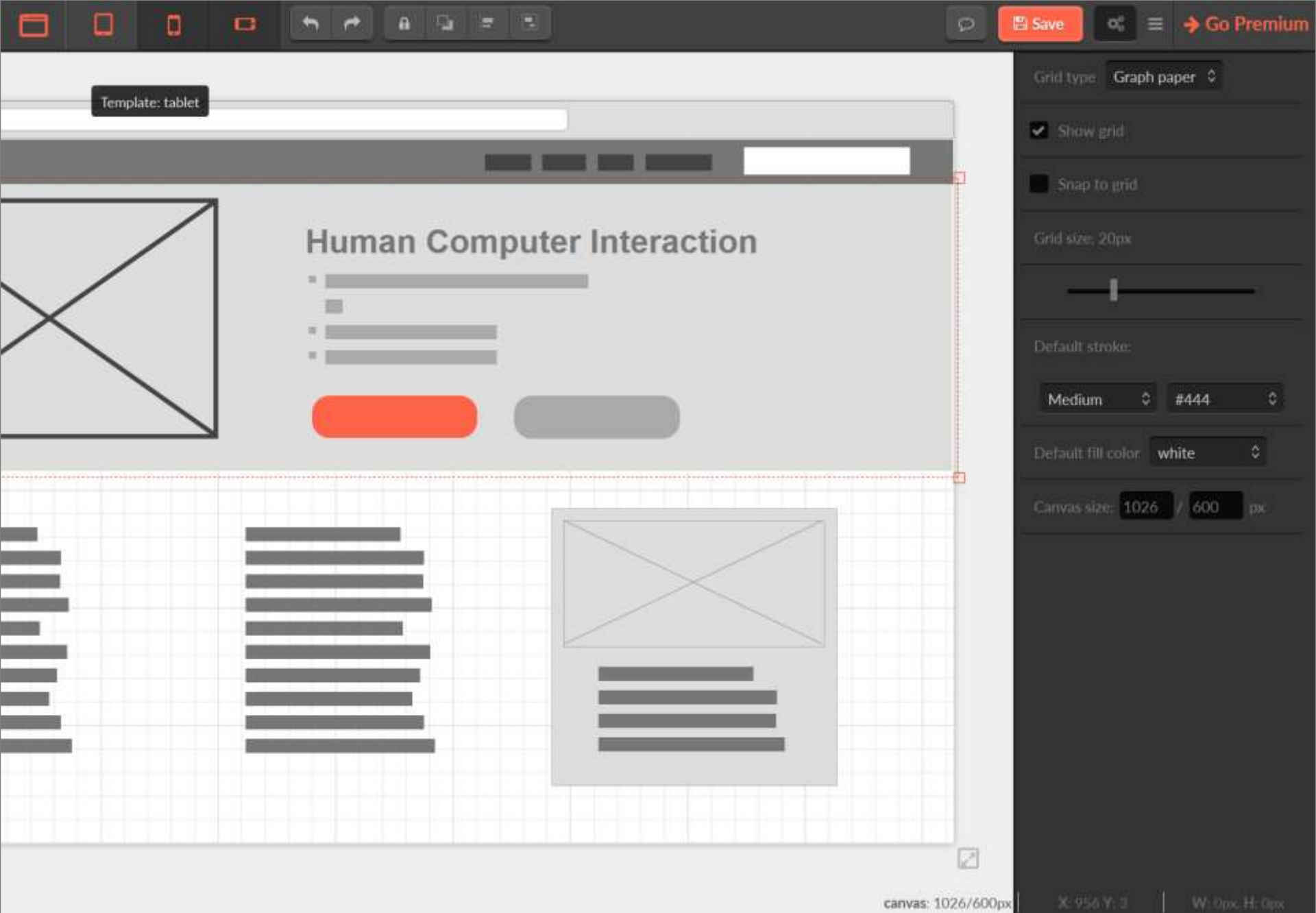
**WorldWideWeb** system (Tim Berners-Lee, ~1990)  
25 years of Web – [www.slideshare.net/busaco/25-de-ani-de-web](http://www.slideshare.net/busaco/25-de-ani-de-web)



# Types of user interfaces:

## Web interface

browser – limited controls provided by (X)HTML  
hypertext/hypermedia  
RIA (Rich Internet Applications)  
(a)synchronous interaction  
based on open standards  
availability – world-wide audience



wireframe.cc (2015)

Types of user interfaces:

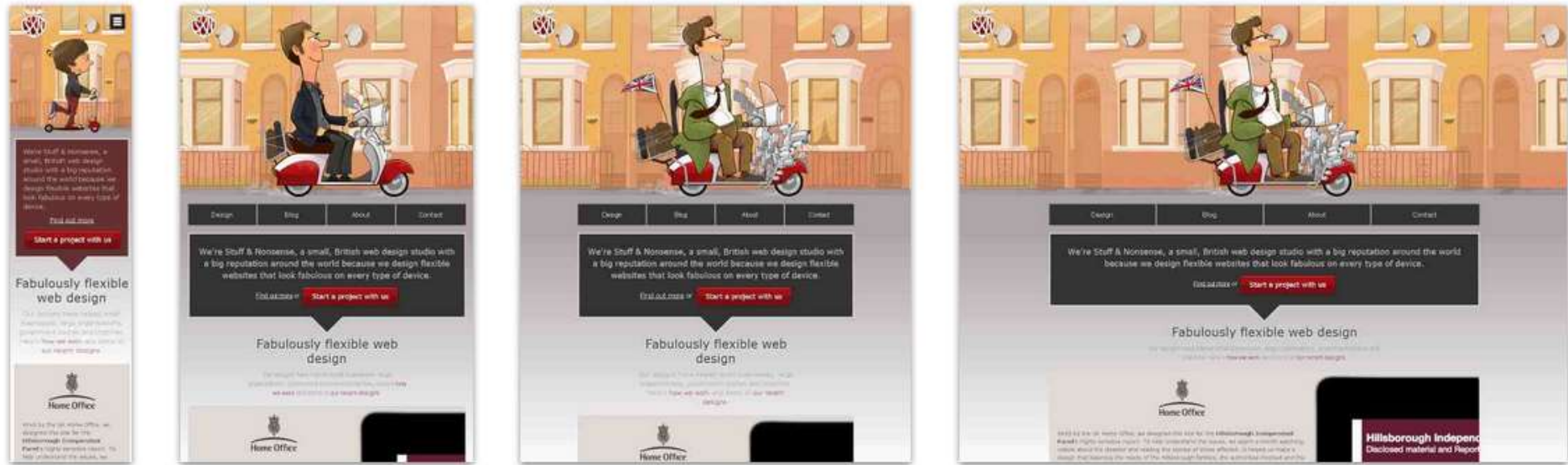
**mobile user interface**

# Types of user interfaces:

## **mobile user interface**

limited resources/features:

display resolution, memory, I/O, power etc.,  
one task vs. multi-tasking, off-line vs. on-line,  
context awareness services,  
different business models ▶ *app stores*



challenge:

interaction design in the context of multi-device UI  
► responsive design

see also [www.punchcut.com/perspectives/](http://www.punchcut.com/perspectives/)

# Types of user interfaces:

**natural UI**

# Types of user interfaces:

## natural UI

new interaction paradigms + new expectations,  
haptic, gesture, locomotion, auditory & voice, tangible UI,  
augmented and virtual reality,  
physical computing, ambient intelligence (AmI),  
emotion & persuasion,...



get blindsided  
beloved backers  
tech support

INDIE  
2012

**BLINDSIDE**

Like Share 215

What if the things in the night didn't just go bump? *BlindSide* is a terrifying new **audio-only adventure game**, set in a fully-immersive 3D world you'll never see. Put on your headphones, close your eyes, and explore the darkness. Listen as the world rotates around you!

You play as Case, an assistant professor who wakes up blind, to find his city destroyed and **mysterious creatures devouring people**. Will you and your girlfriend be able to find your way without sight? How will you escape? Run for your life, navigate the darkness, and uncover the mystery of the apocalypse--all in the dark!

*BlindSide* was inspired by co-creator Aaron Rasmussen's temporary blindness as a result of an explosion in high school chemistry.

Available on the App Store






vimeo.com/64149547







37,6 fps

Press  to edit.



## Shok Sage Gamplay + Makey Makey Controls

from **blankdots** 9 months ago /     NOT YET RATED

Short Kodu Shooter Adventure GameE (ShoK SAGE).

It was a fun experiment (considering the visual programming language) to work with Kodu Game Lab.

The overall map is a modified version of the kodu and Golden Apple Lesson.

Best experience when played with Makey Makey & modeling clay controls.

The visual programming language utilized by Kodu, was interesting but it is definitely addressed to beginners who haven't programmed before. Having some knowledge about programming did come in handy, but at the same time made the visual programming language a bit confusing.

## User – desktop, Web, mobile,... – interface

part of a program/application

- at the desktop, Web, mobile/wearable device,... level – which permits users to expose their intentions (goals) with respect to the actual software and to interpret the results of certain actions performed by the machine

**User – desktop, Web, mobile,... – interface**

perceived by the user not only as a visual part  
of a certain software application

# User – desktop, Web, mobile,... – interface

from the point of view of an user,  
it represents the entire system

the application *per se*

# UI quality attributes

(Jakob Nielsen, 2012)

**utility**

provides the **features users need**

# UI quality attributes (Jakob Nielsen, 2012)

## usability

how **easy & pleasant** the features are to be used

# UI quality attributes

(Jakob Nielsen, 2012)

**useful**

**usability + utility**

Everyone who uses a (software) tool  
is conducted by a **motivation**



**SORT BY**

- Distance
- Alphabetical
- Rating

**FILTER**

**Price**

Any

**Distance**

0.25 1 5 10 20

**Special Offers (all)**

				
Cappuccino	Espresso	Green Tea	Iced Coffee	Beans
				
Caramels	Ethiopia Drip	Macchiato	Shared Chemex	Sumatra Drip

**BROWSE BY DECADE**

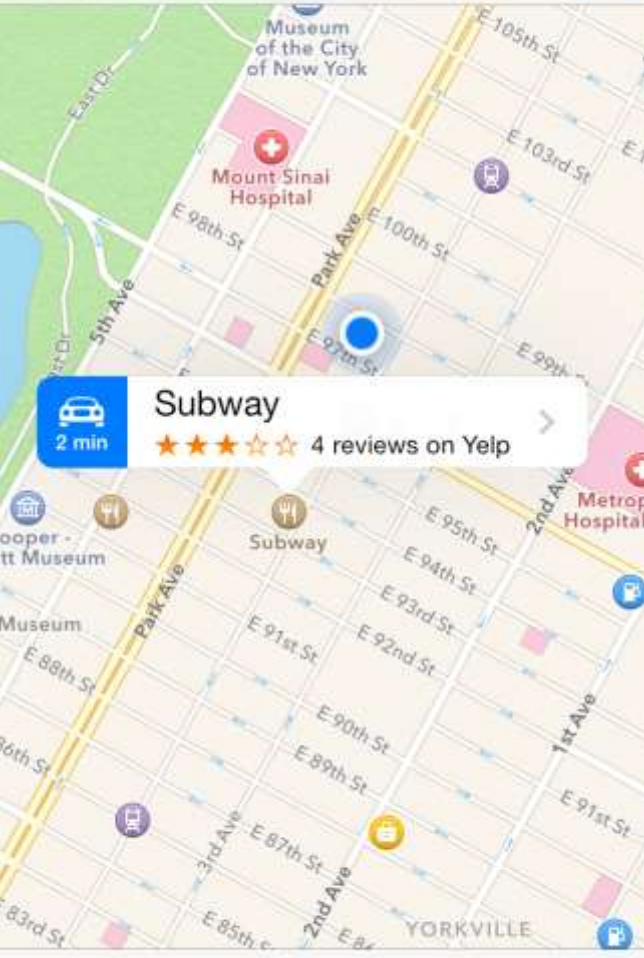
1800s | 1900s | 1910s | 1920s | 1930s | 1940s | 1950s | 1960s | 1970s | 1980s | 1990s | WWI | WWII

**BROWSE BY POPULAR TAGS**

ads animals architecture automobiles aviation behind the scenes bikes children criminal event famous people fashion festival funny girls history landscape **life** magazine movies

Verizon 11:33 PM 60%

Search or enter an address



**Subway**

2 min

★★★★☆ 4 reviews on Yelp

finding an entity: information, object, user, etc.

Explore Our Questions

website-design usability forms gui-design mobile interaction-design navigation user-behavior web-app

buttons more tags

3 votes 1 answer 74 views **What is the most intuitive way to rotate an object in 3D space** interaction-design editor 8h ago zoidbergi 118

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2 votes 3 answers 113 views **Responsive website or not?** mobile interaction-design responsive-design 1d ago oopsi 101

(self)learning and/or instruction

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FlowingData 8

1 more source

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Codrops 1

Planet RDF 2

programming is terrible 1

Scott Hanselman 1

WebAppers 3

14 more sources

Recently Read

FlowingData 8 unread articles — 45K readers — #infography #data #design



**Audio landscape**  
Audio Landscape is a novel music visualizer that constructs a landscape based on the MP3 that you give it. As 41 by Nathan Yau / 3d



**Not just one chart**  
There is no more reason to expect one graph to "tell all" than to expect one number to do the same. —John Tukey, 9 by Nathan Yau / 3d

FEB 12



**Algorithm-generated song, based on income data**



12:28

# PayPal account

**Maria Lee**  
Balance \$86.88 USD  
Available \$51.19 USD

### RECENT ACTIVITY

Kara's Cupcakes	-\$8.20 USD
Completed	6/16/2014
Rare Device	-\$4.20 USD
Completed	6/16/2014
Michael Solomon	-\$5.00 USD
Completed	6/15/2014
Mari's Coffee Cart	-\$5.00 USD
Completed	6/15/2014

12:46

# PayPal SEND MONEY

To: Erin Hagen

Amount: \$25.00 USD

Message: Thanks for dinner last night!

What's this payment for?

- Friends or Family
- Goods or Services

No fee for you. The seller pays the fee. Plus, you may be covered by PayPal Purchase Protection.

12:34

# PayPal MERCHANT

Mirabelli's Grocery 0.2 miles  
2180 O'Nel Drive  
San Jose  
CA 95131

performing a process – e.g., a (business) transaction



social interactions – at a real and/or virtual level



# Alecsandru Grigoriu PRO

📍 Iași, Romania    🐦 alecsandru

**21** Followers    **26** Following

**Shots** Projects Likes Tags Bucket

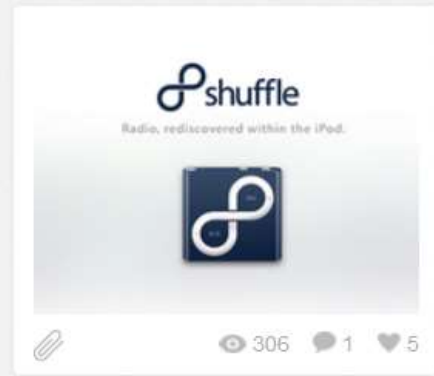
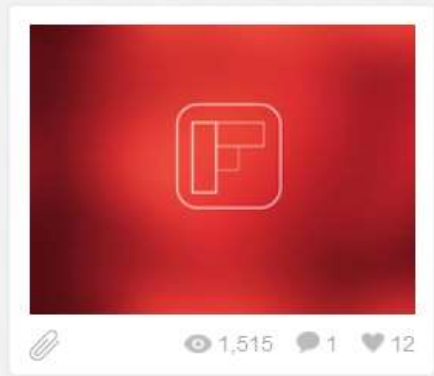
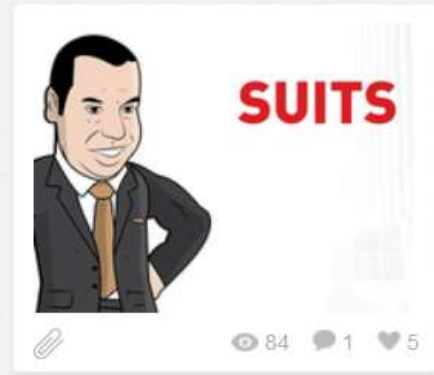
## About Alecsandru Grigoriu

Computer Science Graduate (both BSc and MSc) working as User Experience Designer. I like to draw characters and listen to The Killers.

- user experience design
- user interface design
- character design
- illustration
- game design
- wireframes
- sketching
- web design
- paper prototyping

## Projects 6

- Microsoft Surface Ring**  
1 shot • 1 attachment  
updated 26 days ago
- Project CoCo**  
1 shot  
updated about 1 month ago



creating an artifact:  
(micro)blog note, picture, article, source-code,...



entertainment – individual vs. community

# UX – User Experience

Defining the perception of a product/service from the point of view of person(s) who use it and the apparent pleasure/satisfaction



Designing the Experience

Architecting the Technology

Delivering the Experience

Defining the Problem

Managing the Project



# UX – User Experience

“Every product that is used by someone has a user experience: newspapers, ketchup bottles, reclining armchairs, cardigan sweaters.”

James Jesse Garrett, 2003

# UX – User Experience

Cannot design a user experience,  
only design **for** a user experience

# UX – User Experience

**experience** = **expectation** ▶ user is satisfied

75

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81

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83 &lt;li&gt;

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http://

free s

85 &lt;/li&gt;

86

87 &lt;li&gt;

88 &lt;p&gt;Plea

under t

creativ

Creativ

license

89 &lt;/li&gt;

90 &lt;/ul&gt;

91

cp

**CSS Primer**

Converts HTML classes and IDs into CSS

install v2013.12.05.23.07.08; github.com/vaicine/sublimetext-css-primer

**ChordPro**

Adds ChordPro support to SublimeText2

install v2012.09.22.07.58.20; github.com/kudanai/sublime-chordpro

**ColorPicker**

A multi-platform color picker plugin

install v1.8.1; weslly.github.io/ColorPicker/

**CakePHP (tmbundle)**

Official CakePHP TextMate Bundle Git Repository

install v2012.01.06.01.56.51; cakephp.org

**CakePHP (Native)**

Native Sublime Text 2 CakePHP Package

install v2013.03.31.11.31.32; github.com/josegonzalez/sublimetext-cakephp

f="ader"&gt;

s"&gt;

# UX – User Experience

**experience** > **expectation** ▶ user is delighted



node.js socket



More ▾

### Does Node.js new Socket create a Unix file socket

Well when you connect a **socket**, `socket.fd` is not null, at least in my example case please.

Note that you can also specify existing file descriptor at `socket`

[PHP Socket Server vs node.js Web Chat](#)

[Should I connect directly to CouchDB's socket and pass HTTP proxy](#)

### net Node.js v0.10.25 Manual & Documentation

The `handle` object can be set to either a server or **socket** (and a `{fd: <n>}` object. This will cause the server to accept connections presumed that the file descriptor or handle has already been opened. [nodejs.org/api/net.html](http://nodejs.org/api/net.html) More from [nodejs.org](http://nodejs.org) ▶

### Socket.IO: the cross-browser WebSocket for realtime apps.

**Socket.IO** aims to make realtime apps possible in every browser and mobile device, blurring the differences between the different transport mechanisms [socket.io](http://socket.io) More from [socket.io](http://socket.io) ▶

### TCP Socket Programming in Node.js - Hack Sparrow

Programming TCP **Sockets** in **Node.js** Eager to know how **sockets** are programmed in Node? There are three variants of **sockets** in Node - i. TCP, ii. UDP, iii. UNIX [hacksparrow.com/tcp-socket-programming-in-node-js.html](http://hacksparrow.com/tcp-socket-programming-in-node-js.html) More from [hacksparrow.com](http://hacksparrow.com) ▶

### Node.js- Socket Programming with C# and Javascript - Bruno ...

SPECIAL

Sort by date

I'm feeling ducky

TRY SEARCH ON...

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Images - Bing (!bi)

Images - Google (!gi)

Map (!m)

News (!n)

Wikipedia (!w)

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SHOW ALL

By category (!bang)

Alphabetically

+ Add to Browser

Give feedback

Try this search on:

node.js docs

StackOverflow

Nettuts+

SlideShare

Heroku Devcenter

Anonymous adblock user, [X]

We respect your use of adblock. Some of us use it too. Will you please [make an exception](#) for our one ad?

# UX – User Experience

**experience** < **expectation** ▶ user is dissatisfied

Your session has expired. Please sign in again

Close

[www.buigallery.com](http://www.buigallery.com)



# case study

UX and interaction  
between users and mobile devices

**Task oriented**

Help others

Take care of personal administrative tasks

Plan my time effectively

Always be available to others

Educate myself

Have access to information

Get to know new people

Stay in touch with loved ones

Archive my media and documents

**With others**

**By myself**

Share my experiences

Let others know how I am feeling

Know what's going on

Shopping

Plan social gatherings

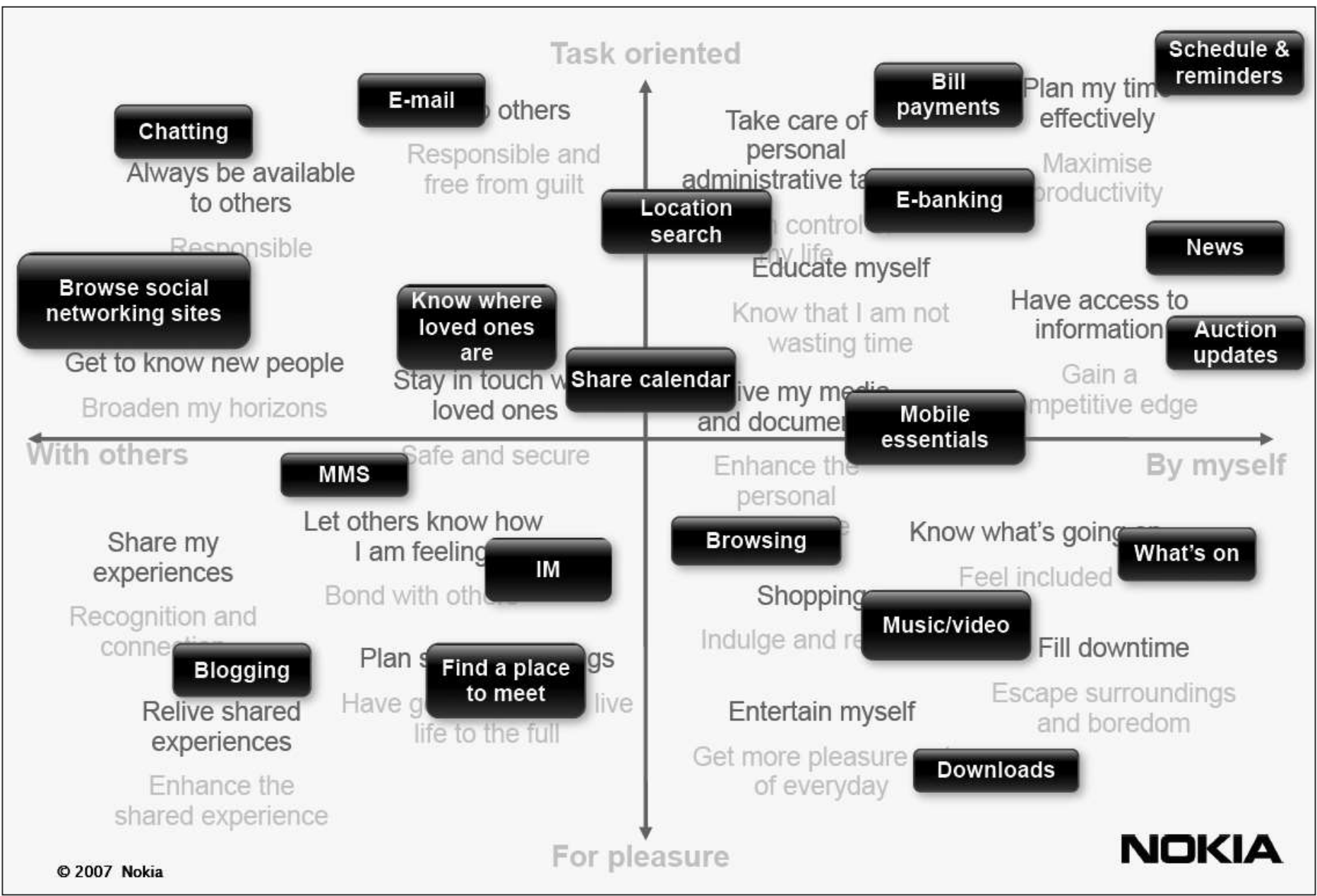
Fill downtime

Relive shared experiences

Entertain myself

**For pleasure**

**NOKIA**



# Main categories of interactions (in the mobile/wearable device context)

Application Centric  
Activity Centric  
Timeline Centric  
Context (Location) Centric  
Process/Task Centric  
Emotion Centric  
People/Identity Centric

<http://johnnyholland.org/2010/05/archetypes-and-their-use-in-mobile-ux/>

# IA – Information Architecture

The necessity of organizing the information  
desired by the users

# IA – Information Architecture

The solutions of presenting the content regard the **IA – Information Architecture**

# Sabin Buraga



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REST and some Python (or 'Pyt...

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HCI 2014 (1 of 10): Overview

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HCI 2014 (2 of 10): Human Fac...

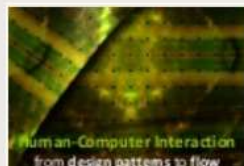
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199 views  
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HCI 2014 (3 of 10): Design Mo...



HCI 2014 (4 of 10): From Info...



abandoned  
 abused  
 abiding  
 abdominal  
 abstracted  
 abhorrent  
 abiding  
 abject  
 able  
 abnormal  
 abrasive  
 abroad  
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 60s  
 70s  
 80s





# IA – Information Architecture

We can adopt different techniques regarding  
**data visualization**

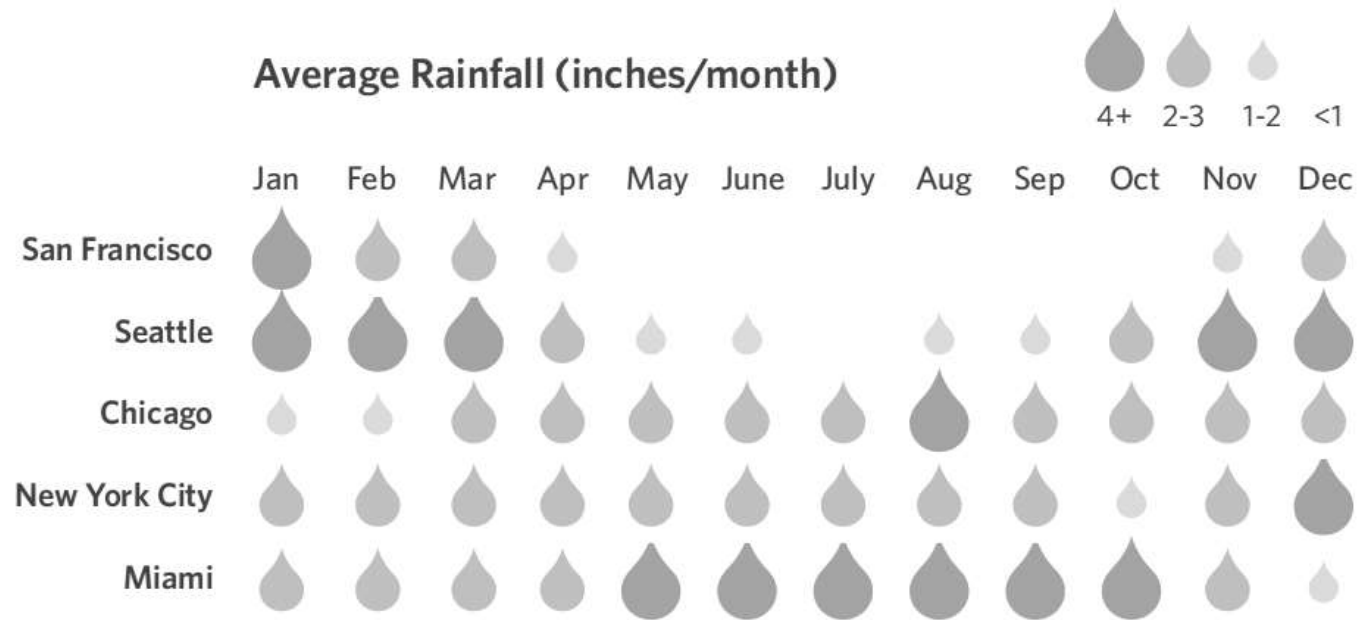
4.35 3.17 3.06 1.37 0.19 0.11 0.03 0.05 0.20 1.22 2.86 3.09  
5.35 4.03 3.77 2.51 1.84 1.59 0.85 1.22 1.94 3.25 5.65 6.00  
1.53 1.36 2.69 3.64 3.32 3.78 3.66 4.22 3.82 2.41 2.92 2.47  
3.17 3.02 3.59 3.90 3.80 3.65 3.80 3.41 3.30 2.88 3.65 3.42  
2.01 2.08 2.39 2.85 6.21 9.33 5.70 7.58 7.63 5.64 2.66 1.83

from raw data to knowledge

### Average Rainfall (inches/month)

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
San Francisco	4.35	3.17	3.06	1.37	0.19	0.03	0.06	0.05	0.20	1.22	2.86	3.09
Seattle	5.35	4.03	3.77	2.51	1.84	1.59	0.85	1.22	1.94	3.25	5.65	6.00
Chicago	1.53	1.36	2.69	3.64	3.32	3.78	3.66	4.22	3.82	2.41	2.92	2.47
New York	3.17	3.02	3.59	3.90	3.80	3.65	3.80	3.41	3.30	2.88	3.65	4.42
Miami	2.01	2.08	2.39	2.85	6.21	9.33	5.70	7.58	7.63	5.64	2.66	1.83

from raw data to knowledge



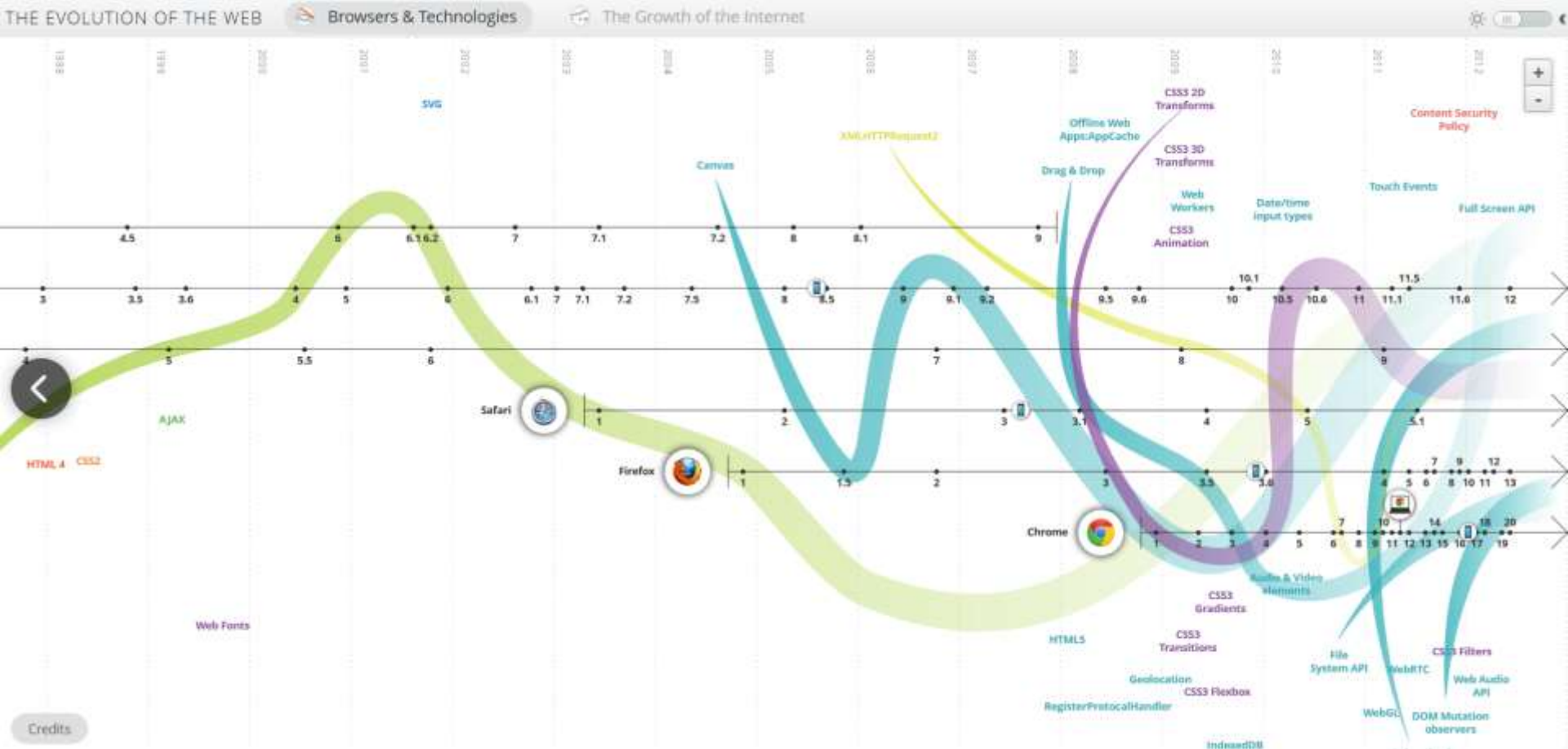
from raw data to knowledge

# IA – Information Architecture

We can adopt different techniques regarding  
**data visualization**

**visual design**

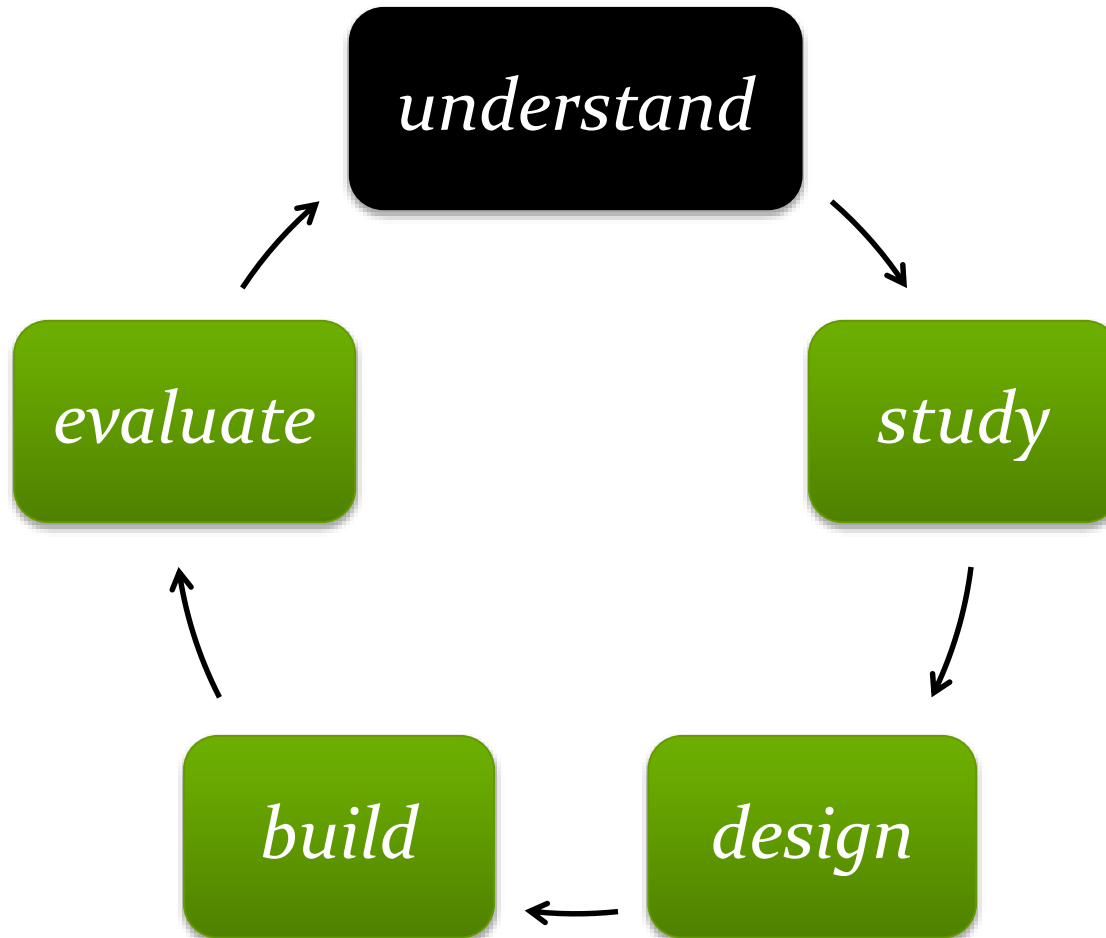
visual representation  
infographics



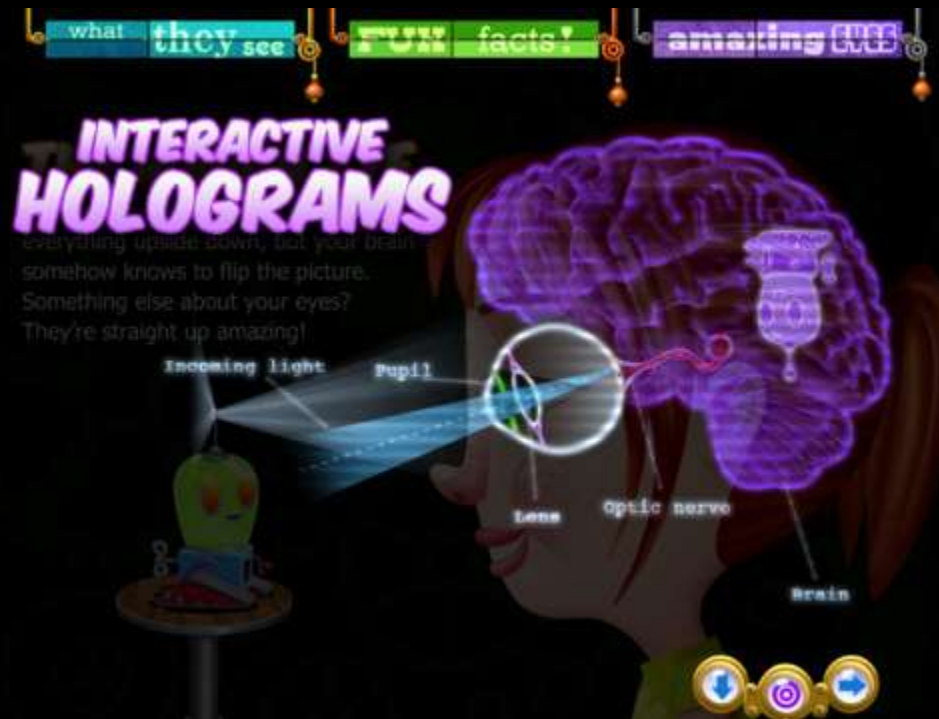
example: *The Evolution of the Web*  
[evolutionofweb.appspot.com](http://evolutionofweb.appspot.com)

for details, consult [www.informationisbeautiful.net](http://www.informationisbeautiful.net)

# HCI: process



Microsoft, 2008



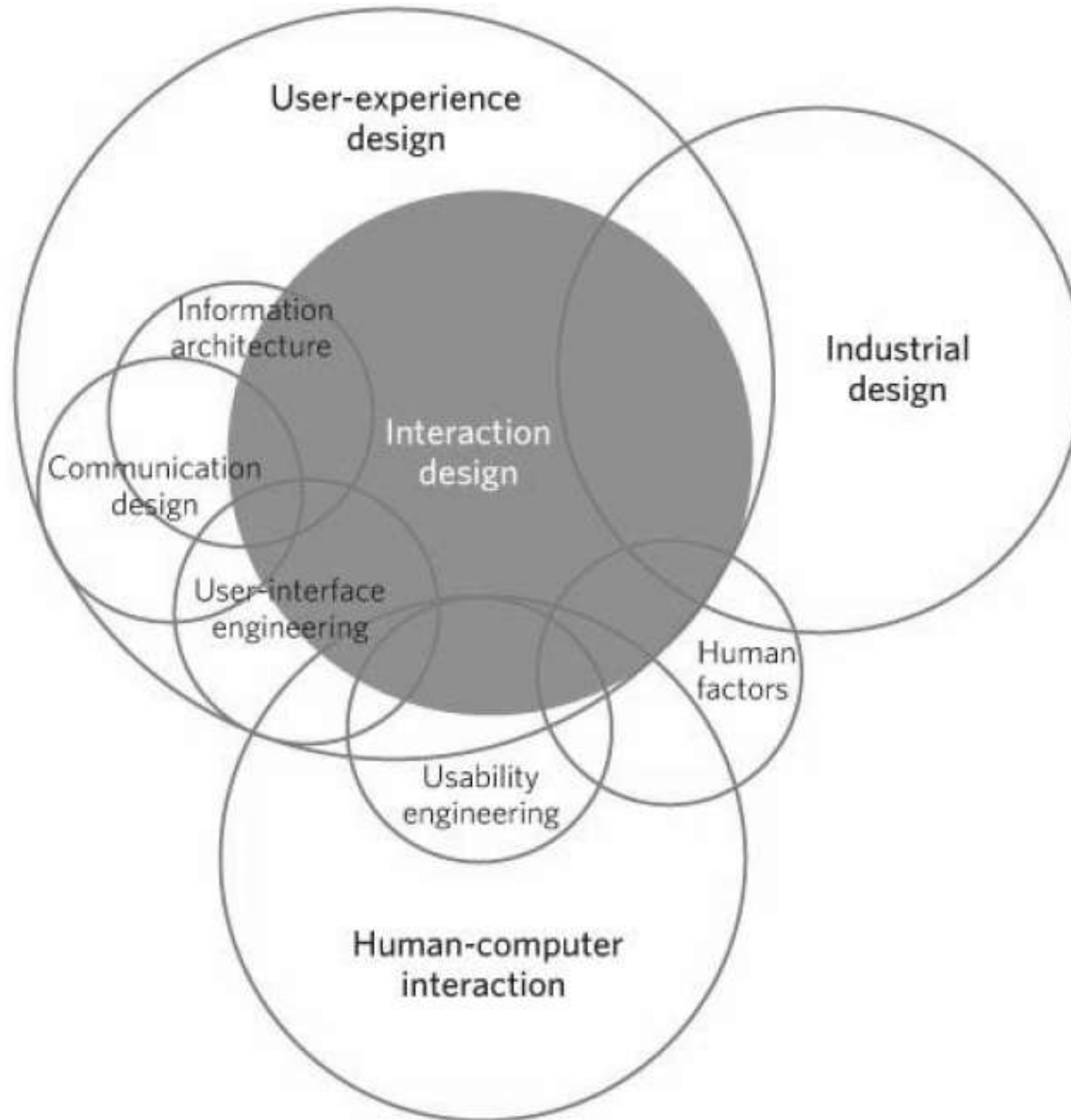
The most important aspects regarding the UI design?



# interaction design

“Designing interactive products to support the way people communicate and interact in their everyday and working lives.”

Sharp, Rogers & Preece, 2007



related domains (Dan Saffer, 2006)

# interaction design: issues

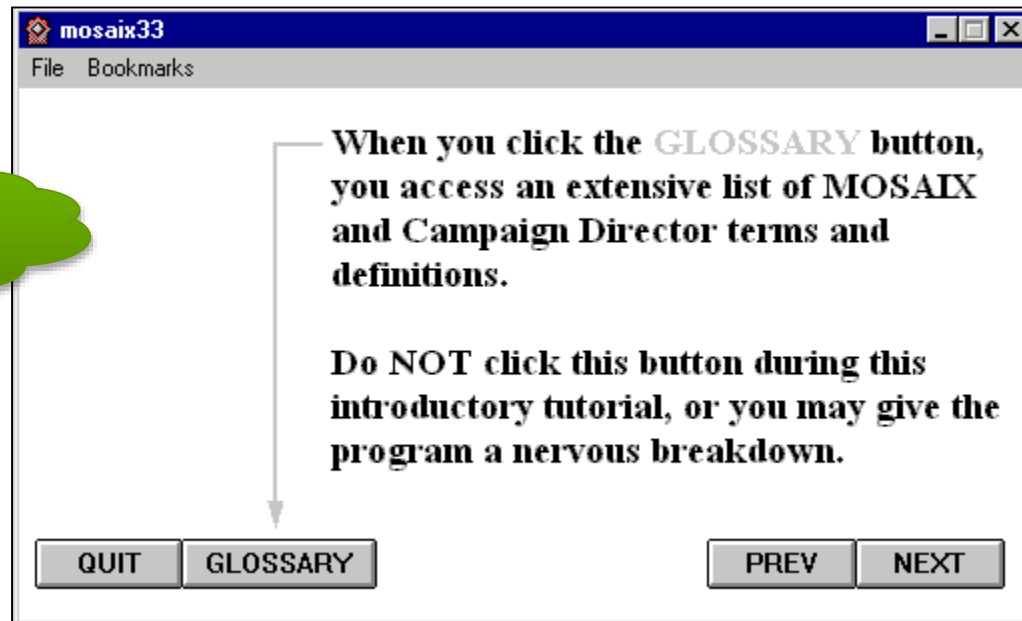
*“Digital products are rude.”*

Alan Cooper *et al.*, 2007

# interaction design: issues

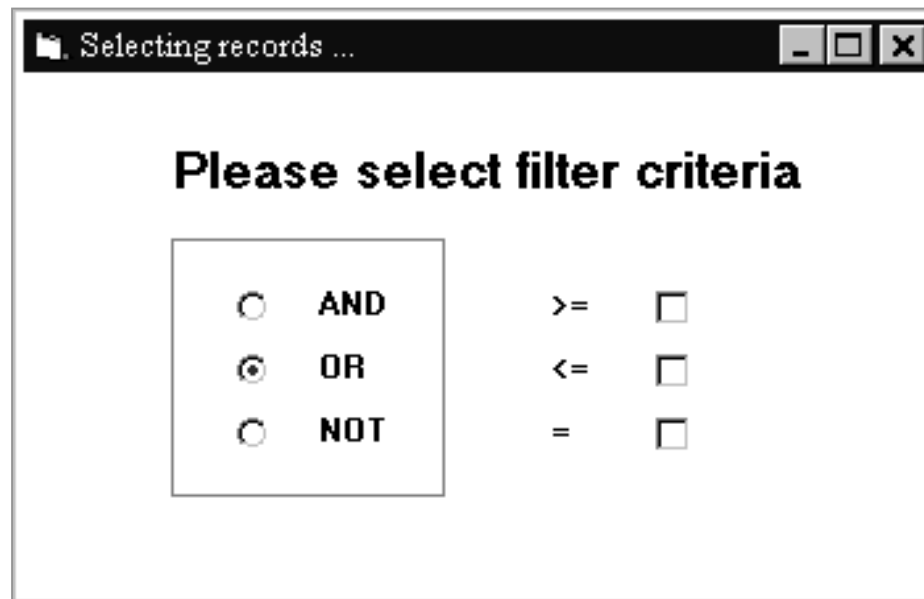
The user is in charge with the application  
(developer) mistakes

stupidity?



# interaction design: issues

Users must think as computers  
...they don't want to learn the "Boolean" language



Selecting records ...

**Please select filter criteria**

<input type="radio"/> AND	>=	<input type="checkbox"/>
<input checked="" type="radio"/> OR	<=	<input type="checkbox"/>
<input type="radio"/> NOT	=	<input type="checkbox"/>

# interaction design: issues

Usually, applications do not help people

The screenshot shows a web form titled "Post a comment" with three steps:

- Step 1: Select account**
  - ImageShack user
  - Twitter user
  - Remember me
  - [Sign in with Twitter](#)
- Step 2: Add comment and/or images**
  - A text input field with a "no photo" icon on the left.
  - Text: "You could use following HTML tags in your comments: <a>, <i>, <b>"
  - Upload image/video
  - Upload URL
  - A text input field with a "Browse..." button.
  - Text: "allowed formats: jpg jpeg png gif bmp tiff swf < 1.5 megabytes."
- Step 3: Type the text below to avoid spam**
  - A text input field with a "Type the text:" label and a red arrow icon.

At the bottom are "Post" and "Cancel" buttons.

A modal dialog box is overlaid on the form, titled "The page at http://img530.yfrog.com says:". It contains a yellow warning icon and the text "Please, enter captcha text", with an "OK" button at the bottom.

# Sign Up!

The easiest way to post anything online.

**Oops. We ran into 9 problems!**

Try to fix these issues and try again.

**Password can't be blank**

**Password is too short (minimum is 5 characters)**

**Sitename can't be blank**

**Sitename must begin and end with a letter or number**

**Sitename can't match your password**

**Sitename has already been taken**

**Email can't be blank**

**Email must be in a valid format**

**Email has been taken by another user. Did you sign up with another account?**

**Login instead. If you think this is in error, email us at [help@posterous.com](mailto:help@posterous.com)**

Email is invalid.

Password can't be blank.

Why digital products are so “nasty”?

# interaction design

Ignoring reality aka the target public  
(the common user)

we tend exclusively to develop software for the “elite”

see <http://developerexperience.org/>



# interaction design

Conflicts of interests:

developers

*versus*

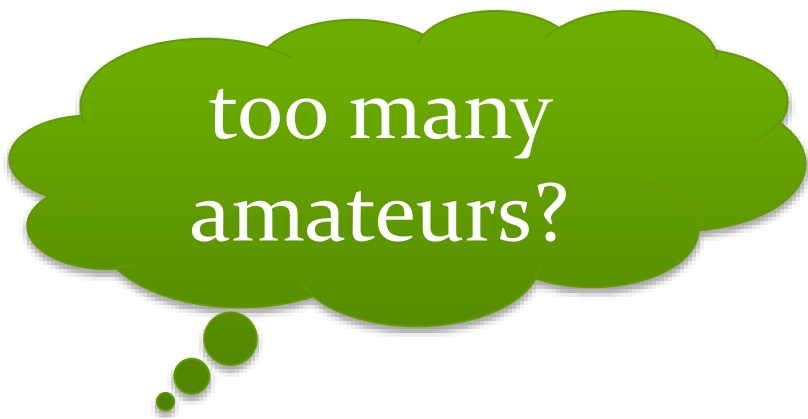
business

# interaction design

The lack of a coherent process regarding the developing of the common software

# interaction design

The lack of a coherent process regarding the developing of the common software



too many  
amateurs?

# interaction design

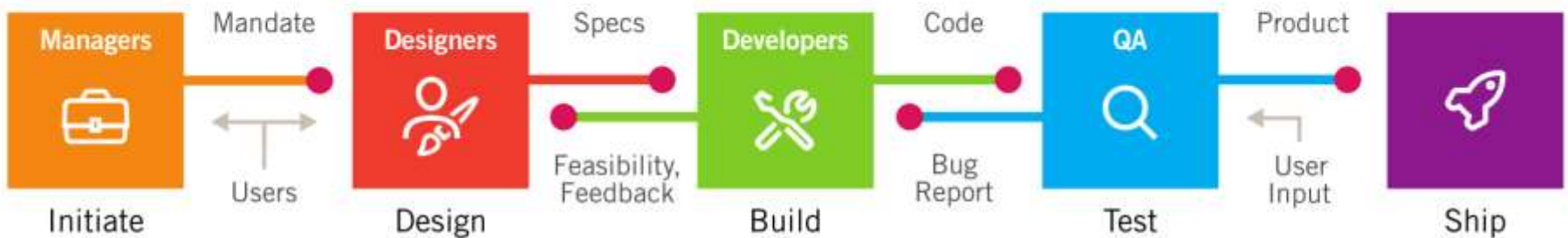
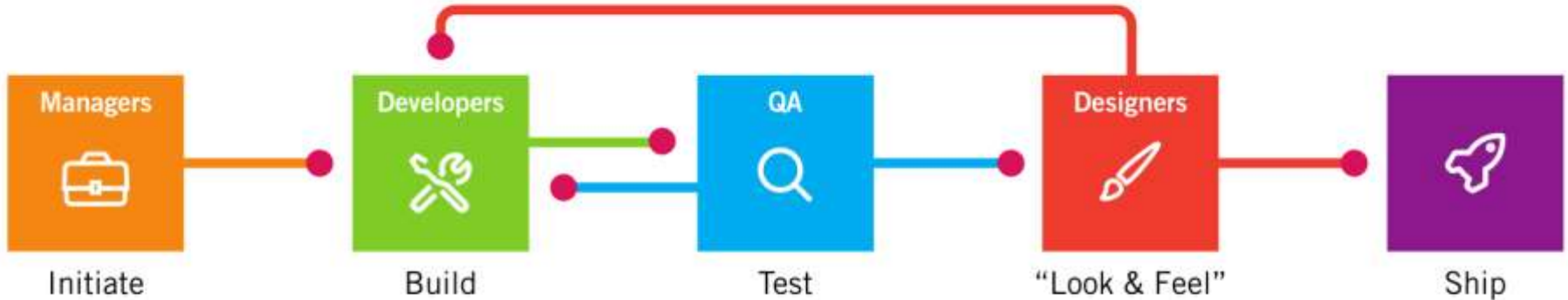
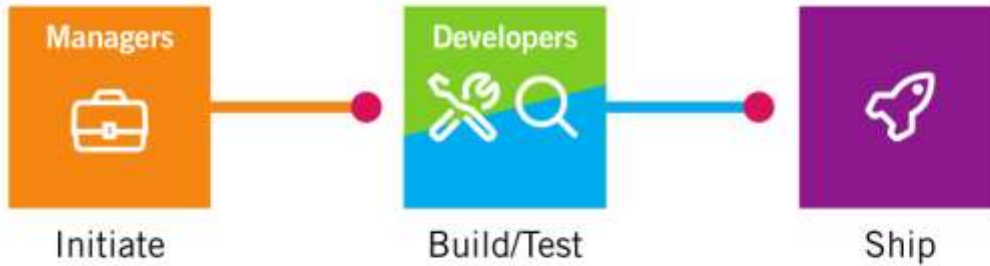
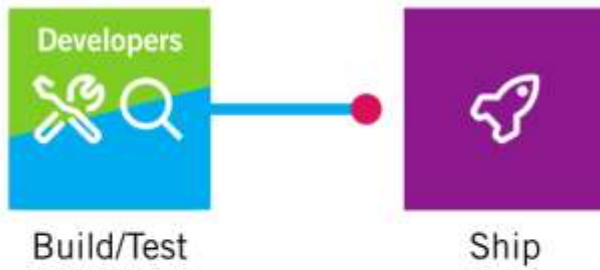
The lack of a coherent process regarding the developing of the common software



typical example:  
Web development

# The evolution of the software development process

Alan Cooper *et al.*, 2014



# interaction design

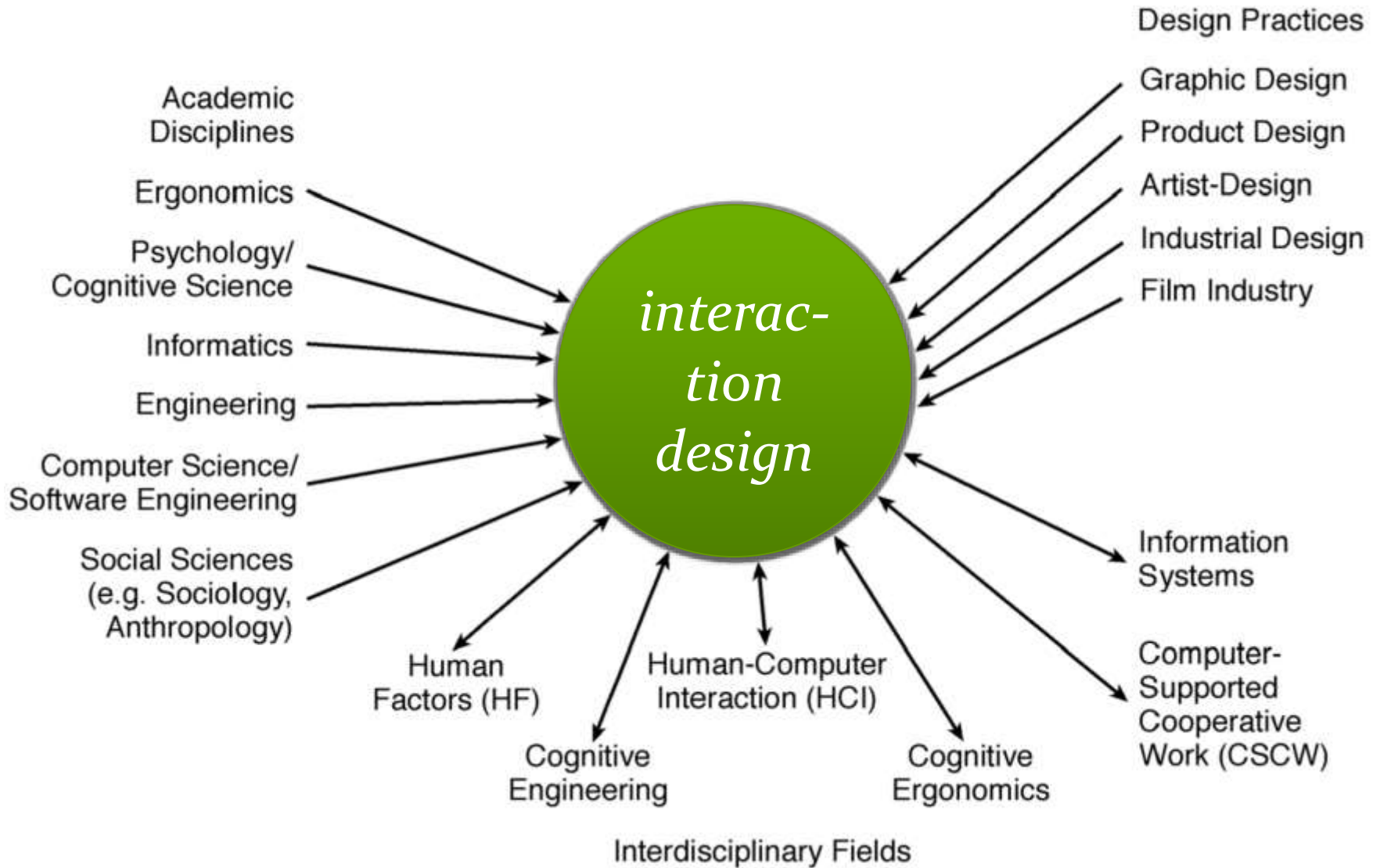
The complexity of software applications is greater than the one of the tangible products

“If your UI even vaguely resembles an airplane cockpit, you’re doing it wrong.” – John Gruber

# interaction design

The process of interaction design is an inter-disciplinary one (Rogers, 2007)





research regarding interaction design (Yvonne Rogers, 2007)



# interaction design: questions

What we want to create (develop)?

# interaction design: questions

How about the premises?

# interaction design: questions

What are the final goals?

# interaction design: questions

We'll really obtain what we hope?

# interaction design: questions

If yes, how?

# interaction design: questions

How about the intrinsic difficulties?

# interaction design: questions

Can we (re)use an existing solution?

# interaction design

The design process must be performed with respect to the user requirements/goals

**user-centered interface design**



# interaction design

Users (clients) typically speak to you in terms of desired features and solutions, not of needs and problems.

Jenifer Tidwell, 2006

# interaction design: questions (II)

How the software will be used?

# interaction design: questions (II)

Who will use the developed application?

# interaction design: questions (II)

How often software will be used?

# interaction design: questions (II)

How long the user will interact  
to the application?

# interaction design: questions (II)

How about the easiness of using  
a given application?

# interaction design: questions (II)

Software will be portable?

# interaction design: questions (II)

How about the internationalization, localization, accessibility of the application?



# interaction design

Important aspect:  
understanding the problem to be solved

# interaction design

Important aspect:  
understanding the problem to be solved

in order to create the desired design (application)

# interaction design

## Aspects:

UI type(s): desktop, Web, mobile, TV screen,...

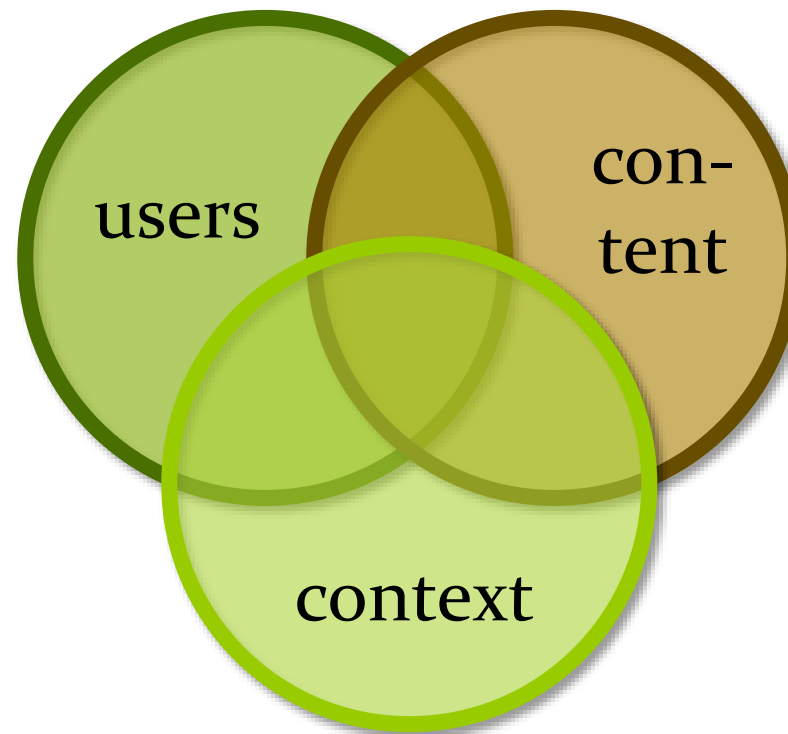
user expected behavior

functionalities

user categories: children, teens, special users, etc.

...

# interaction design





the interaction with a specific application is often driven by **context**: user goal(s) & attitude (e.g., emotional state), available time, location, (social/cultural) environment,...

T. Urff, *Deliver UX that converts on Web, Mobile and Apps* (2015)  
<http://optimizely.slides.com/tobyurff/deliver-ux-that-converts-on-web-mobile-and-apps>

# interaction design

Study: how a phone call differs regarding the means used to be performed?

using a classical phone unit

*versus*

via a mobile device: an old and/or last generation phone

*versus*

using a VoIP software – *e.g.*, FaceTime, Skype

# interaction design

We must consider:

(the categories of) involved users  
performed activities  
the context of using a specific device  
the environment

# interaction design

The need of a **conceptual model**

describes how the system is perceived by its users



# interaction design

The need of a **conceptual model**

software (implementation) model

user (mental) model

environment model

# interaction design

The need of a **conceptual model**

“A high level description of how a system is organized and it functions.”

Johnson & Henderson, 2002

# interaction design

Important issue:

**user model *versus* program model**

Alan Cooper *et al.*, 2007

# interaction design

Example: the spreadsheet conceptual model

analogy with concrete tables used by accountants

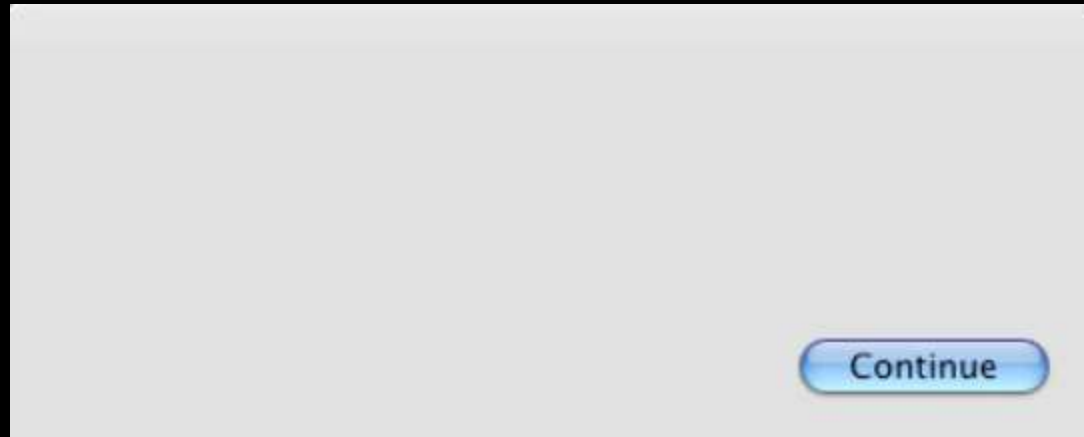
easy to understand

simple interaction

real-time computing of formulas

facilities for further extensions – *e.g.*, URLs as cell values

How about the interface usability?



# usability

**Usability** refers to the “proper” way the users can exploit the functionality of a given system

Jakob Nielsen

[www.useit.com/alertbox/20030825.html](http://www.useit.com/alertbox/20030825.html)

# usability

## *Learnability*

how easily a person can learn to use a system  
(its interface)

# The Dropbox Tour

## Table of Contents

What is Dropbox?	1
Be Anywhere	2
Simple Sharing	3
Always Safe	4
Surprise Yourself	5



[Download Dropbox](#)



When you take photos,  
Dropbox keeps them  
safe for you.



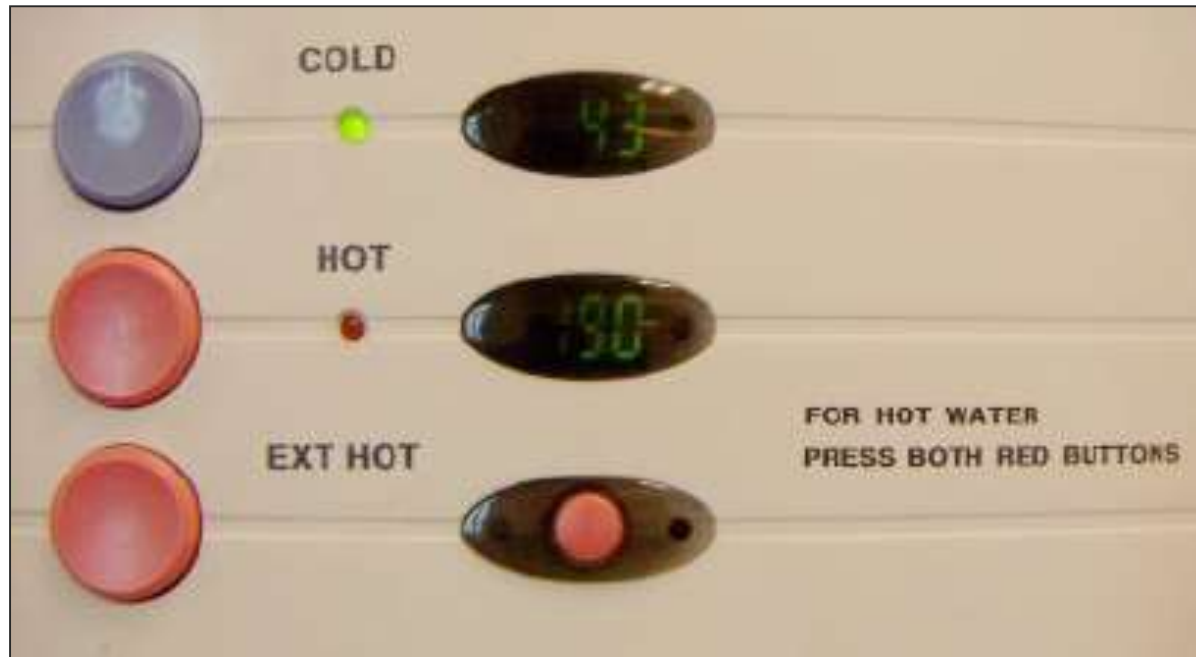


# usability

## *Efficiency*

after user learnt the interface,  
how can (s)he optimally use it?

# usability



# Open

Recent Presentations

OneDrive - Personal

Computer

## Recent Presentations



hci01-HumanComputerInteraction-Overview.pptx  
K » Working » Courses » HCI » 2015 » presentations-src



web01ArhitecturaWeb.pptx  
K » Working » Courses » Web » 2015 » presentations-src

pocket



ux

Newest



A Beginner's Guide to Understanding UX Design

conversioner.com

UX Recipe - a checklist where you discover, choose and estimate your next U

uxrecipe.github.io

UX Project Checklist

uxchecklist.github.io

UX Project Checklist

UX Design Patterns for Augmented Reality

## Recently Viewed



# *Memorability*

it is easy for the users to remember the interaction with the system?

# Two Factor Auth (2FA)

List of websites and whether or not they support 2FA.

Also see the list of [2FA providers](#) and the platforms they support.

Add your own favorite site by submitting a pull request on the [GitHub repo](#).

Backup and Sync	Docs	SMS	Phone Call	Email	Hardware Token	Software Implementation
AeroFS						✓
Backblaze				TELL THEM TO SUPPORT 2FA		
Bitcasa				TELL THEM TO SUPPORT 2FA		
Box		✓				
CloudApp				TELL THEM TO SUPPORT 2FA		
Copy				TELL THEM TO SUPPORT 2FA		
CrashPlan				TELL THEM TO SUPPORT 2FA		
Dropbox		✓				✓
Evernote		✓				✓
Frostbox						✓
Google Drive		✓	✓		✓	✓
iCloud		✓				✓
iDrive				TELL THEM TO SUPPORT 2FA		
JustCloud				TELL THEM TO SUPPORT 2FA		
OneDrive						✓

**Exceptions & Restrictions**

SMS only available on select providers.

## memorability *versus* security

“many authentication systems require users to memorize secrets that they should recall whenever they want to be authenticated by a system” (R. Kainda *et al.*) – [www.cs.ox.ac.uk/files/2859/ares\\_main.pdf](http://www.cs.ox.ac.uk/files/2859/ares_main.pdf)

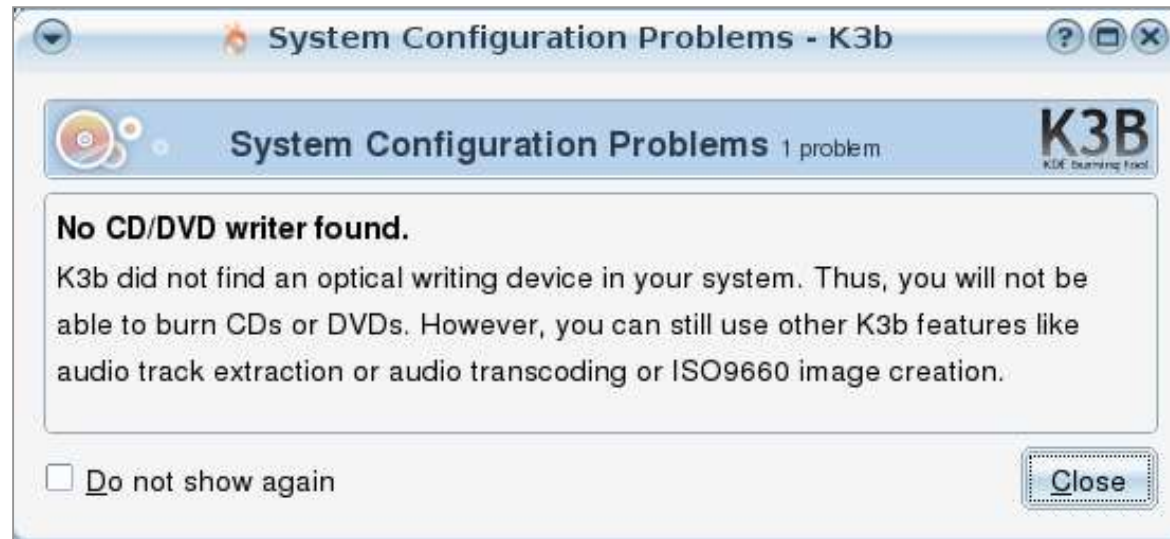
# usability

## *Errors*

the number of potential errors must be minimal

the user mistakes must be easily  
detected/corrected

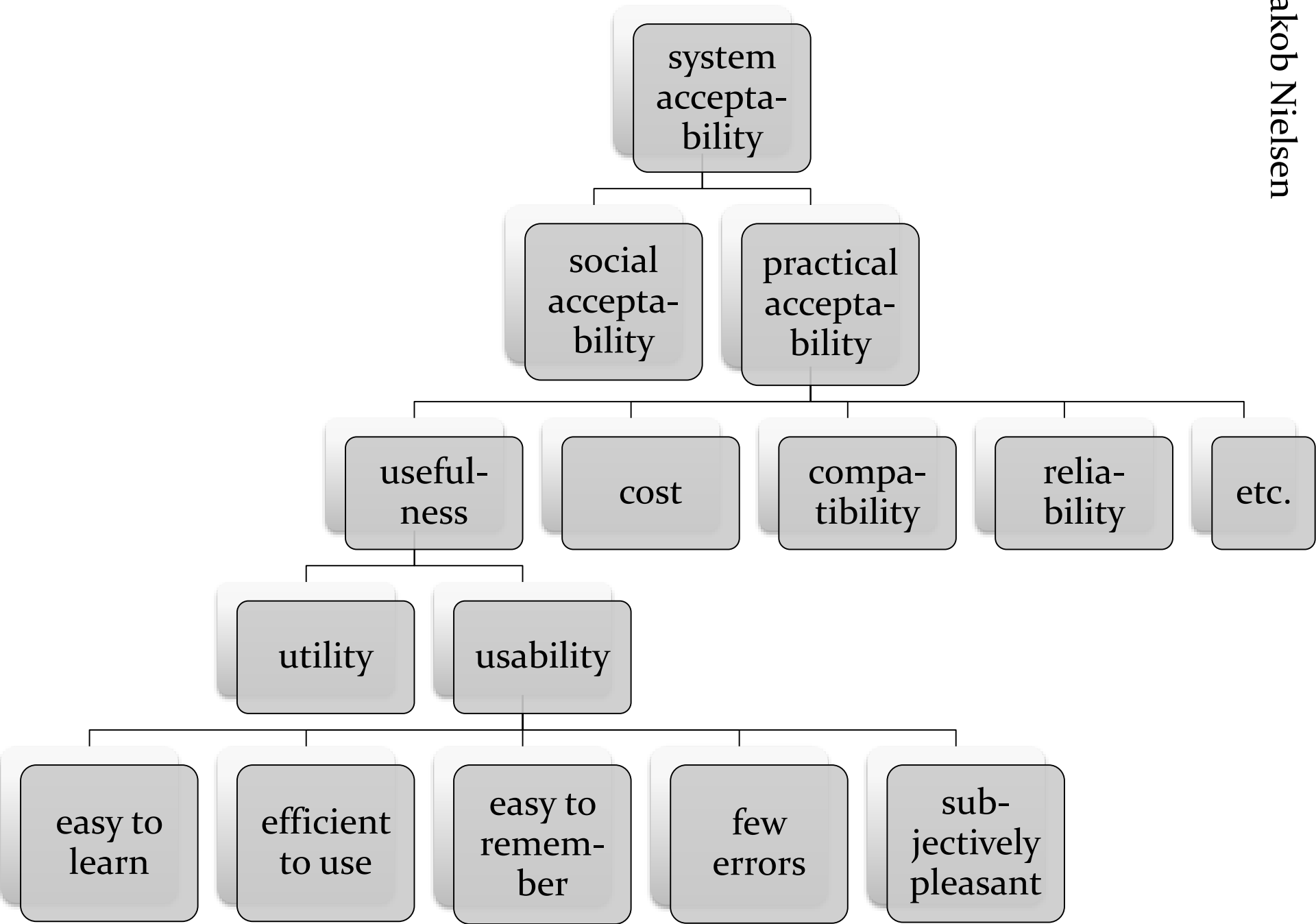
# usability



# usability

## *Satisfaction*

the user likes to use the application/service?





Math   Greek   Relations   Logic   Symbols   Arrows

$\tilde{a}b$   $\overleftarrow{ba}$   $\overline{ab}$   $\widehat{ab}$   $\sqrt{ab}$   $f'$   $x^k$   $\lim_{a \rightarrow b}$   $\begin{bmatrix} a \\ b \end{bmatrix}$   $(a)$   $f$   $\Sigma$   $\Pi$   $\cap$   $\cup$   $\otimes$

$\hat{a}b$   $\vec{ab}$   $\underline{ab}$   $\overbrace{ab}$   $\sqrt[n]{ab}$   $\frac{a}{b}$   $x_k$   $\frac{\partial^n}{\partial x^n}$   $x = \{ \{a\} \}$   $\phi$   $\sqcup$   $\amalg$   $\cup$   $\wedge$   $\oplus$

`\int_{0}^{\pi} \sin x \, dx = 2`

clear

Output

Text Color: Blue

Background Color: White

Font: Modern

Font Size: 24

Output Image: PNG

Convert

“The applications that are easy to use are designed to be familiar.”  
Jenifer Tidwell

Learn Latex   Quicky   Symbols   Book 1   Book 2   Book 3

**Sample Latex Equations** Select image thumbnail then click the **Orange** button. To preview a sample file, click the zoom icon.

$a_i^2 + \sum_{i=-1}^n x_i^2$   
 $\lim_{x \rightarrow a} \frac{f(x)}{g(x)}$   
 $\int_0^\pi \sin x$   
 $\frac{d}{d\theta} \sin$   
 $\binom{n}{k} =$   
 $\sqrt{\frac{x^2}{k+}}$   
 $= \begin{pmatrix} x_1 \\ x_4 \\ \dots \end{pmatrix}$   
 $\begin{pmatrix} x_{i,i+1}^2 \\ \lfloor \frac{i+3}{3} \rfloor \end{pmatrix}$

# iCloud for Pixelmator

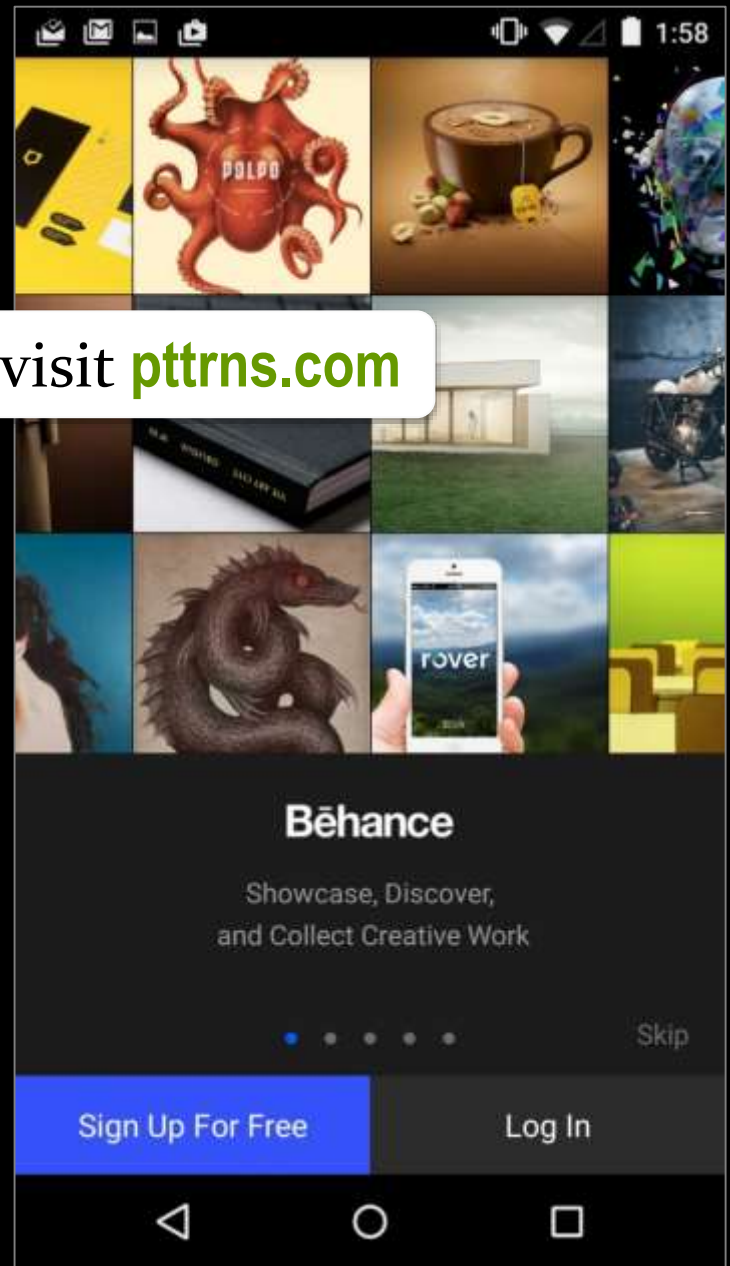
iCloud keeps your images up to date  
on all your devices

for more examples, visit [pptrns.com](http://pptrns.com)



Later

Use iCloud



“Attractive things work better.” – Donald Norman

# remember

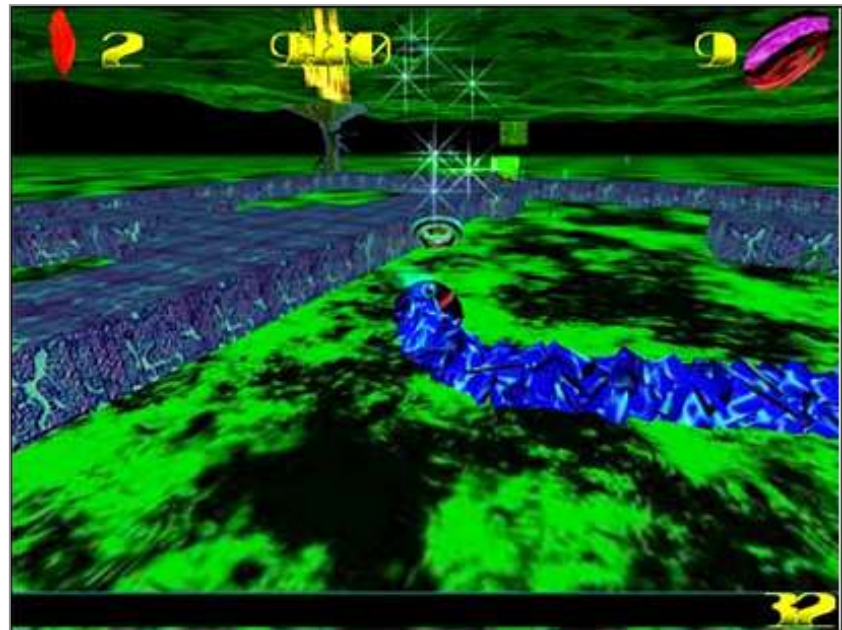
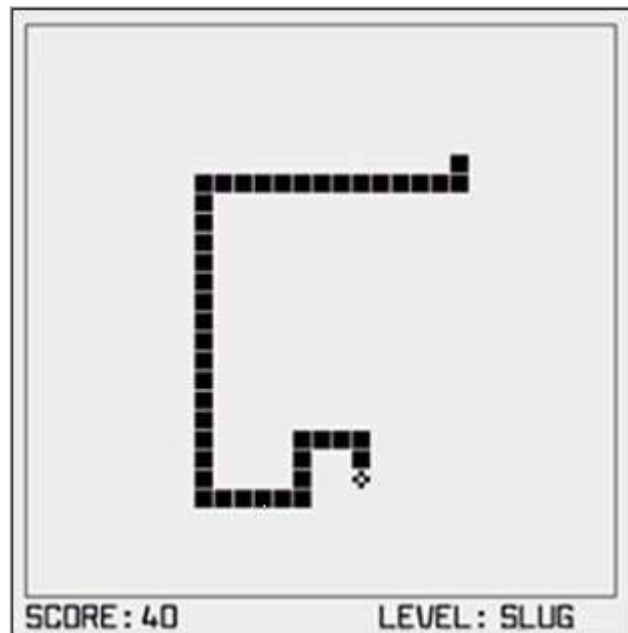
## Keep the Simple Simple

“No matter how complex the overall system,  
there is no excuse for not keeping  
simple tasks simple.”

Jef Raskin

# Keep the Simple Simple

...the most engaging interface of a game?



# remember

A user-interface is considered to be good if the application is behaving conform to the expectations of its users

# remember

A user-interface is considered to be good if the application is behaving conform to the expectations of its users

“The successful games companies are the ones that recognize that their business is **entertainment**, not software.”

Andrew Rollings & Dave Morris, 2004

## essential resources

A. Cooper, R. Reimann, D. Cronin,  
*About Face* (3<sup>rd</sup> Edition), Addison-Wesley, 2007

J. Raskin, *The Humane Interface*, Addison-Wesley, 2000

A. Sears, J. Jacko (Eds.), *The Human-Computer Interaction Handbook* (2<sup>nd</sup> Edition), Taylor & Francis Group, 2008

J. Tidwell, *Designing Interfaces*, O'Reilly, 2005

*HCI Bibliography*

<http://hcibib.org/>

*The Encyclopedia of Human-Computer Interaction*

<http://www.interaction-design.org/books/hci.html>

interaction, agent, IA, cognetics, markup, art, visual design, KISS, control, user testing, idiom, latency, mode, icon, GUI, Fitt's Law, event, human factors, infographics, RAD, metaphor, accessibility, privacy, skin, affordance, prompt, menu, pointer, risk, augmented reality, UX, animation, web, game, graceful degradation, query, tag, prototyping, ID, evaluation, task, design patterns, gesture, tabs, color, ergonomics, feedback, CLI, script, look & feel, AI, navigation, role, multimodal, audio, RAD, typography, window, voice, mouse, demographics, help, lion, shortcut, direct manipulation, efficiency, paradigm, usability, CADUI, experiment, VR, eye candy, 3D, effect, WYSIWYG, semiotics, i18n, RIA, style, tooltip, iterative, keyboard, pervasive, learnability, hypertext, anticipation, handheld, memory, social, natural language, methodology, ubiquitous computing, persona, dialogue, user, screen, wireframe, PUI, zoom, psychology, recommender system, brand, flow, storyboard, architecture, model, responsiveness, satisfaction, touch, undo, metrics, video, semantic



## User Flow Patterns

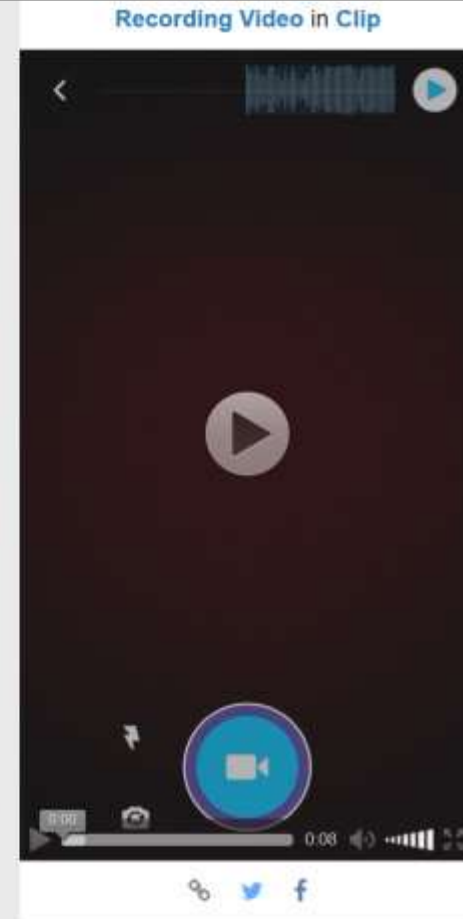
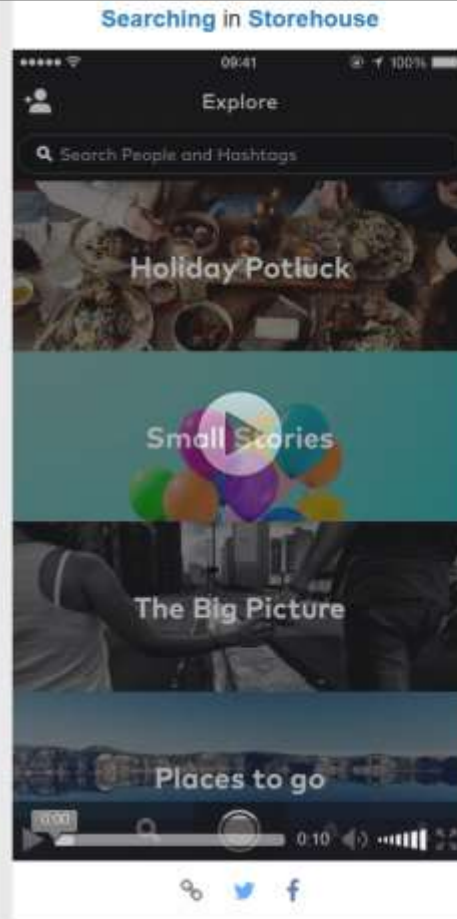
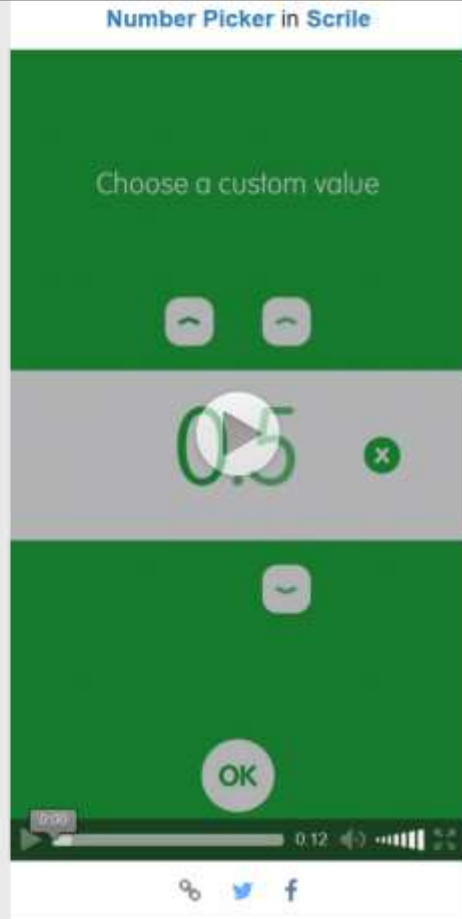
- Color Picker · 4
- Commenting · 1
- Exploring · 2
- Map Browsing · 1
- Navigation · 1
- Number Picker · 2
- Onboarding · 14
- Permissions · 1
- Pull To Refresh · 1
- Recording Video · 2
- Searching · 3
- Share Buttons · 3
- Start/Stop · 1
- Taking a Photo · 2

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- Inbox Pixels
- uiGIFs



next lecture: the human factor