

# Designing for the Web

**Information Architecture and Visual Design** 

Luigi De Russis

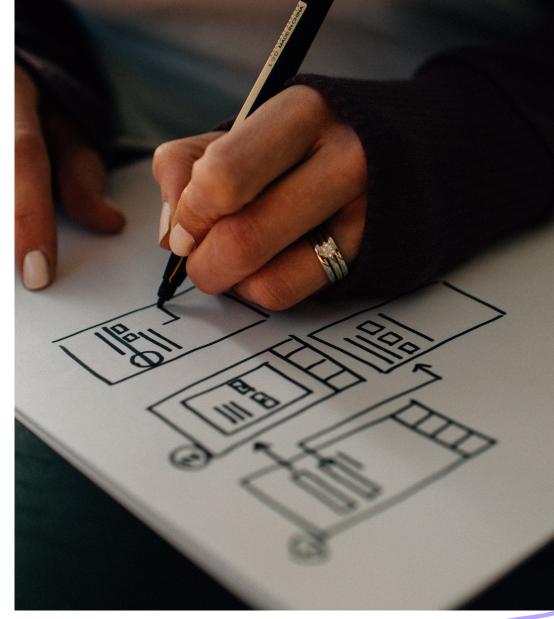


Photo by Kelly Sikkema on Unsplash





## Goal

- To introduce the main concept behind
  - Information Architecture
  - Visual Design
- To design effective web applications



## INFORMATION ARCHITECTURE



## Information Architecture

- "The structural design of shared information environments"
- The combination of organisation, labelling, search, and navigation systems within web sites and applications
- A discipline focused on making information findable and understandable



## Information

- Information architecture is not data and knowledge management
- Data is facts and figures
  - Relational databases are highly structured and produce specific answers to specific questions
- Knowledge is the "stuff in people's heads"
  - Knowledge managers develop tools, processes, and incentives to encourage people to share that stuff
- Information is in the middle
  - With information systems, there is often no single "right" answer to a given question
  - Information can be of all shapes and sizes: websites, documents, software applications, images, and more
  - Metadata: terms used to describe and represent content objects such as documents, people, processes, and organizations

## Users, Context, and Content

#### Users

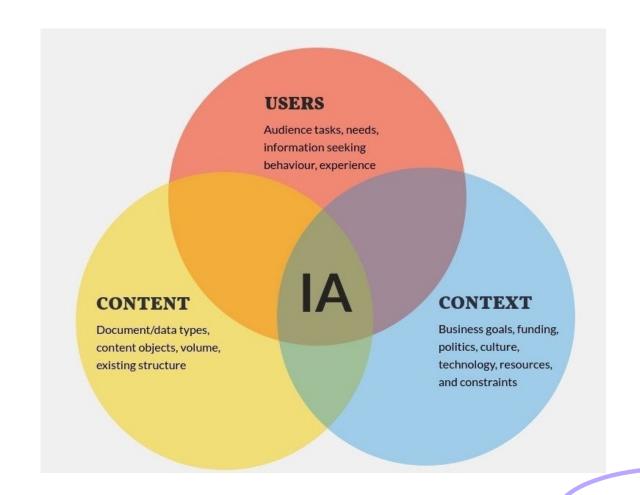
 Do you know who is using your system? Do you know how they are using it? Do you know what information they look for on your system?

#### Content

 The documents, links, media, ... that people need to use or find in the system

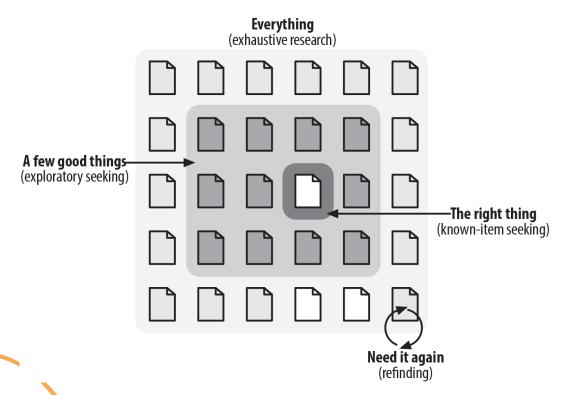
#### Context

All digital system exist within a particular business or organizational context



# Finding and Understanding

Information architecture is focused on making information **findable** and **understandable** 

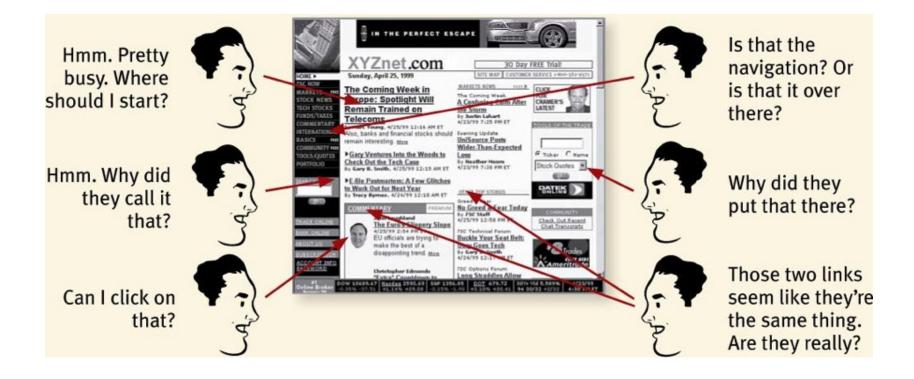


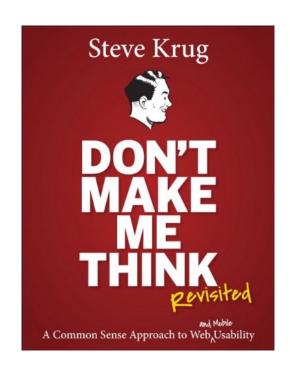
We only *understand* things in relationship to something else

e.g., most bank/university/...
 buildings are similar; their websites
 are similar as well



## Don't Make Me Think



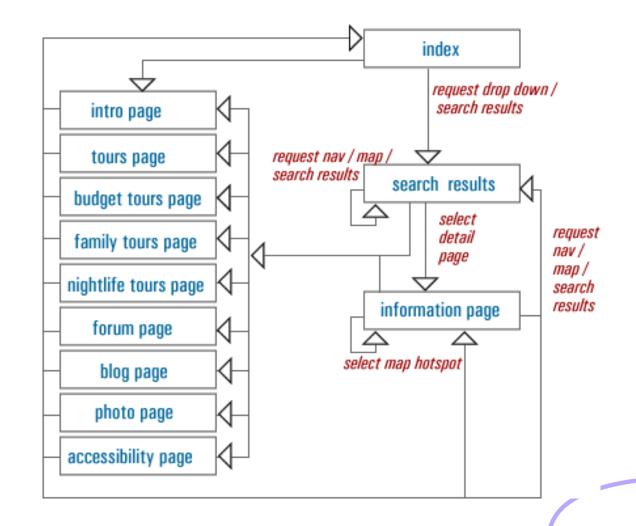


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## Sitemaps

- Show the relationships between information elements
- Can be used to portray organization, navigation, and labeling systems



## **VISUAL DESIGN**



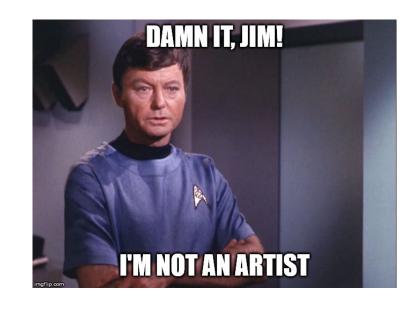
## Visual Design

- **Guiding**: conveying structure, relative importance, relationships
- Pacing: drawing people into your app, orienting them, and showing where to go, providing hooks to dive deeper
- Messaging: expressing meaning and style, breathing life into your content
- Both at the conscious and sub-conscious levels

- And also...
  - Making everything look aesthetically beautiful (but this is not the goal)

## Visual Design vs. Art and Artistic Skills

- A.k.a. «Help, I'm not an artist!»
- Artistic skills help a bit but are neither necessary nor sufficient
- Art does not need to <u>be practical</u>; design does
- Real design skills take years to master
- Widely-accepted heuristics are a good and easy start



## The Basic of VisualDesign

Basic visual design involves text, layout, and colors. First let's start with text. Gracefully using whitespace helps separate out logical chunks of content. Next, font size and style differences convey hierarchy. Finally, alignment is crucial for helping readers scan quickly.

## Whitespace

Basic visual design involves text, layout, and colors. First let's start with text.

Gracefully using whitespace helps separate out logical chunks of content.

Next, font size and style differences convey hierarchy.

Finally, alignment is crucial for helping readers scan quickly.



## Hierarchy

Basic visual design involves ...

#### **Text**

Gracefully using whitespace helps separate out logical chunks of content.

Next, font size and style differences convey hierarchy.

Finally, alignment is crucial for helping readers scan quickly.

#### Layout

**Colors** 



## Alignment

**BASIC VISUAL DESIGN** 

#### **Text**

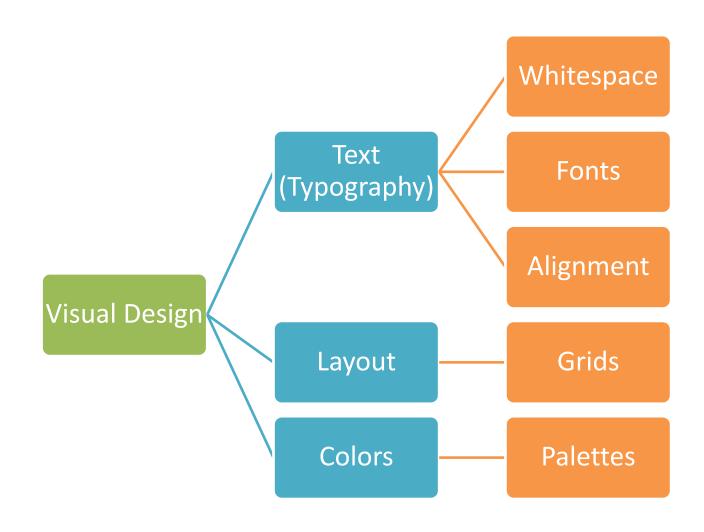
- Whitespace: helps separate out logical chunks of content
- **Font**: size and style differences convey hierarchy
- Alignment: crucial for helping readers scan quickly

Layout

**Colors** 



# Key Ingredients



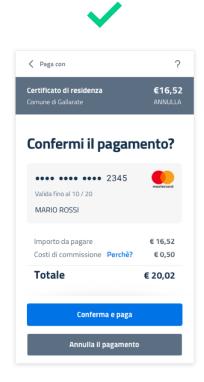
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#### Text

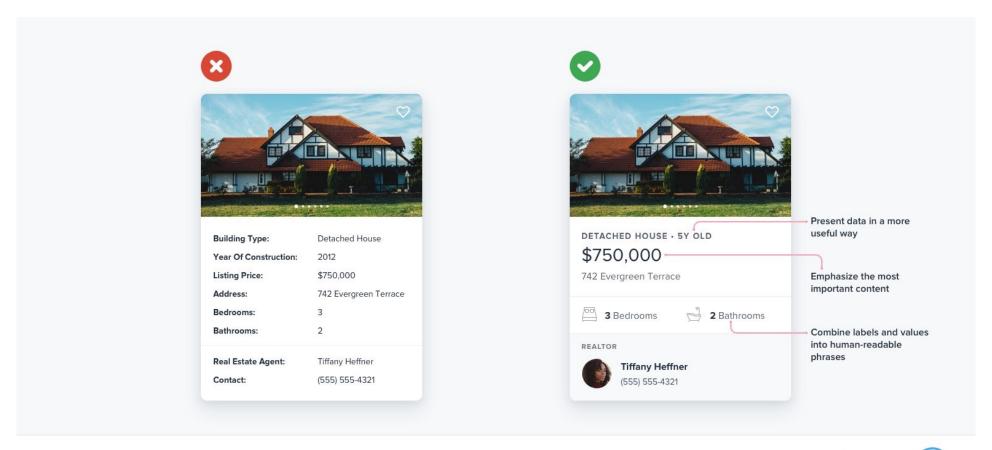
- Font size, color and spacing define a hierarchy of visibility and attention
- The visual hierarchy should match the relative importance of the information content







## Text and Layout Convey Meaning



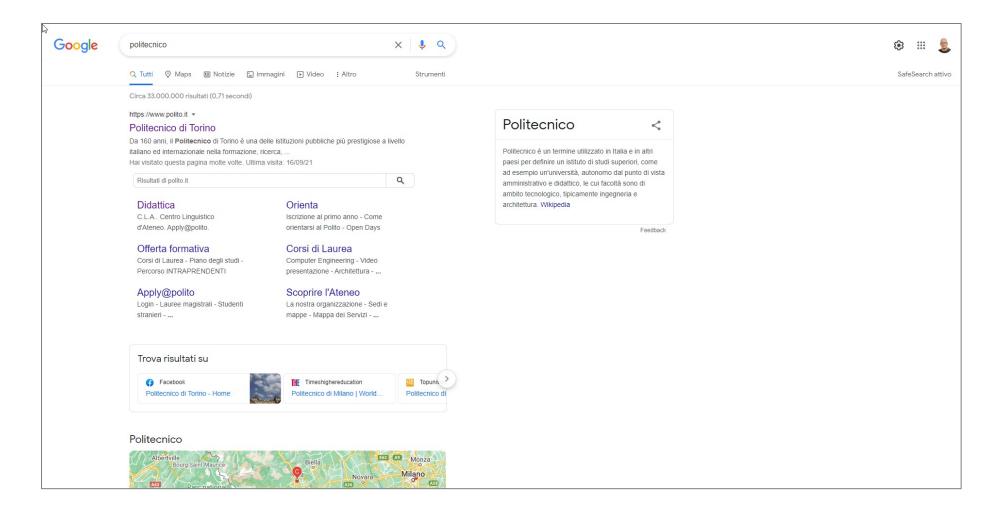
www.refactoringui.com



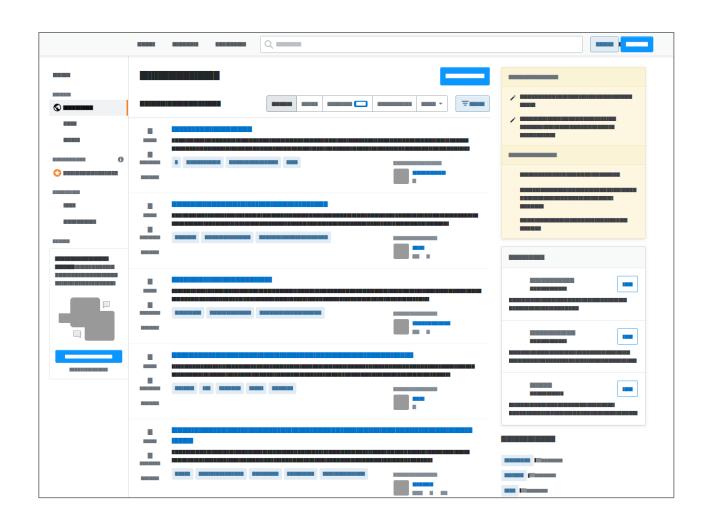
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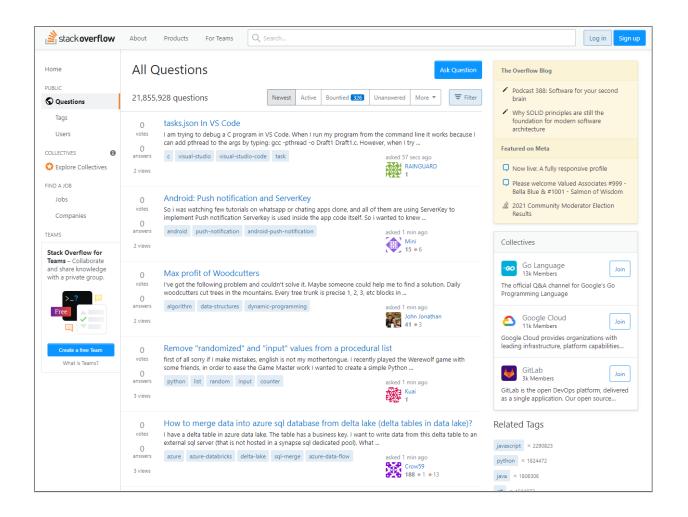
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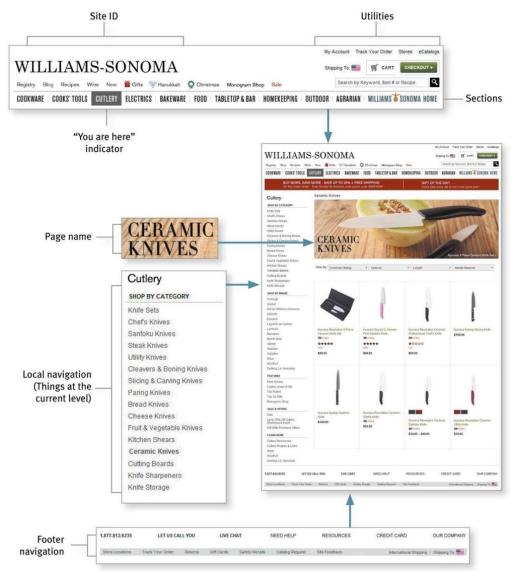








## Conventions Help Recogniting Structure



## 'GESTALT' PRINCIPLES



# 'Gestalt' principles

- Laws from 1920s' psychology: how humans typically see objects by grouping similar elements, recognizing patterns and simplifying complex images
- Designers use these to engage users via powerful -yet natural- "tricks" of perspective and best practice design standards



## Some Gestalt Principles

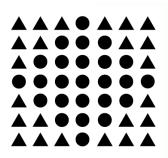
- **Figure/Ground**: Disliking uncertainty, we look for solid, stable items. Foreground catches the eye first
- Closure: Preferring complete shapes, we automatically fill in gaps to perceive a complete image; we see the whole first
- Common Region: We group elements that are in the same closed region
- Element Connectedness: We group elements linked by other elements
- Continuation: We follow and "flow with" lines
- Proximity (Emergence): We group closer-together elements, separating them from those farther apart.
- Good Form: We differentiate elements that are similar in color, form, pattern, etc. and cluster them together

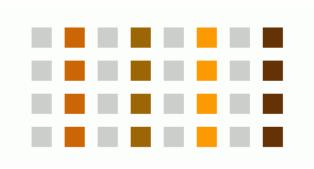
- Meaningfulness (Familiarity): We group elements if they form a meaningful or personally relevant image.
- Prägnanz: We perceive complex images as simple ones.
- Convexity: We perceive convex shapes ahead of concave ones
- Regularity: Sorting items, we tend to group some into larger shapes, and connect elements that form a pattern.
- **Similarity (Invariance)**: We seek differences and similarities in an image and link similar elements.
- Symmetry: We seek balance and order in designs, struggling to do so if they aren't readily apparent.
- **Common Fate**: We group elements that move in the same direction
- **Synchrony**: We group static visual elements that appear at the same time.

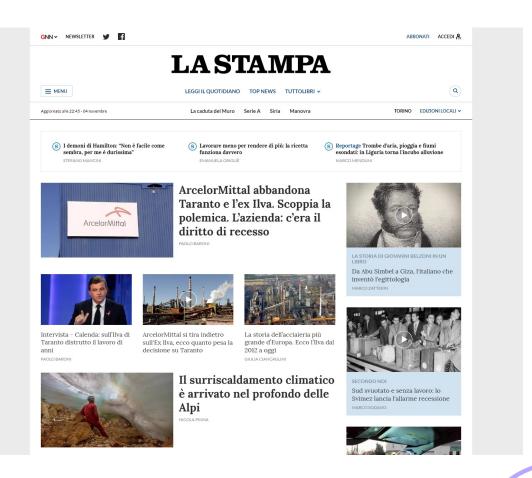


## Examples: Similarity



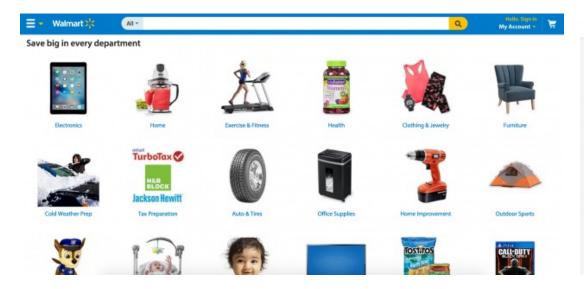


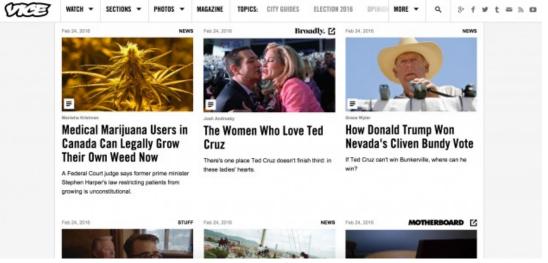




## Example: Proximity









## Example: Continuity



#### Customers Who Bought This Item Also Bought





The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to > Eric Rice 1,062 Hardoover

\$16.66 - Prime



The Innovator's Dilemma: The Revolutionary Book That Will Change the Way • Clayton M. Christensen • Clayton M. Christensen • Clayton M. Christensen • Clayton M. Christensen • Clayton M. Christensen



The Innovator's Solution: Creating and Sustaining Successful Growth Clayton M. Christensen

\$18.33 Prime

How Will You Measure
Your Life?

CLATTON R.
CHARTENERS

How Will You Measure
Your Life?

Clayton M. Christensen

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Step 1

Choose your meals, drinks and treats from our daily rotating menu.



Our friendly servers organize your food for delivery - hot and ready to eat!



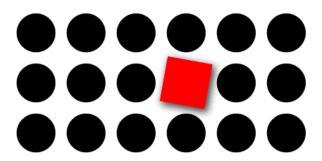
Your meal arrives in around 20 minutes - like a home-cooked meal without the effort!

Step 3

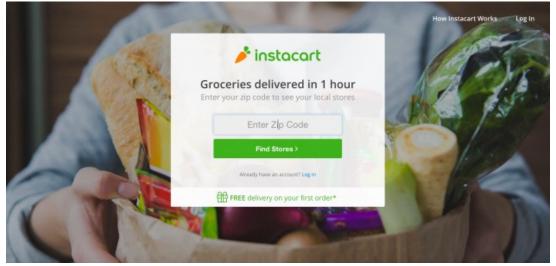
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## Example: Focal Point







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#### **GRID AND ALIGNMENT**

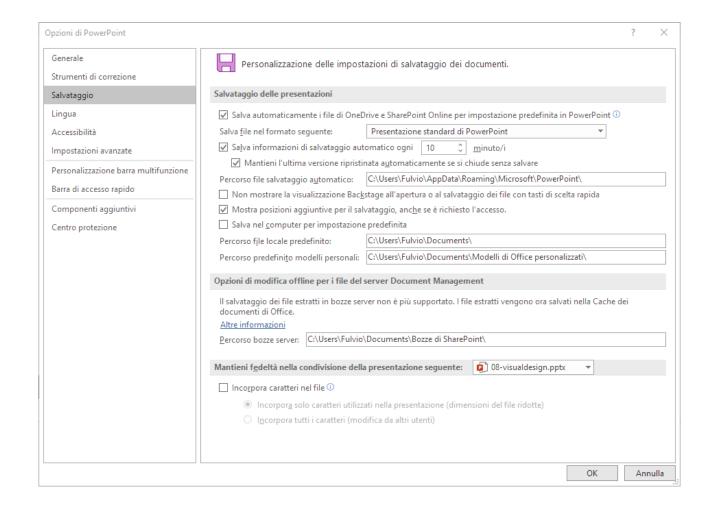


# Alignment

- Invisible lines that run through the interface and "attract" the left- or right-edge of a widget control
  - Vertical
  - Horizontal



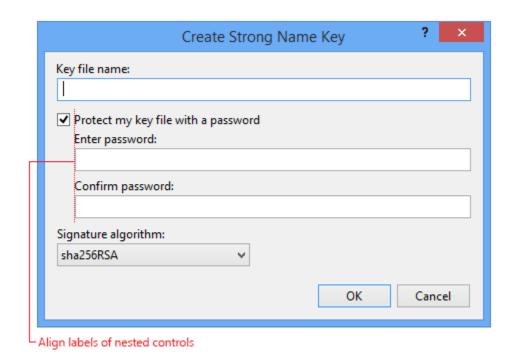
## Example

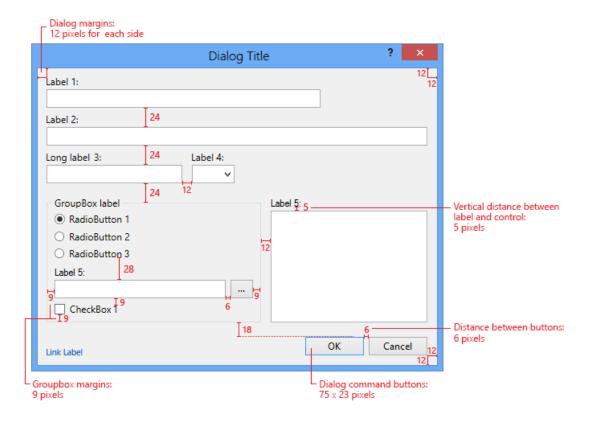


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# Example





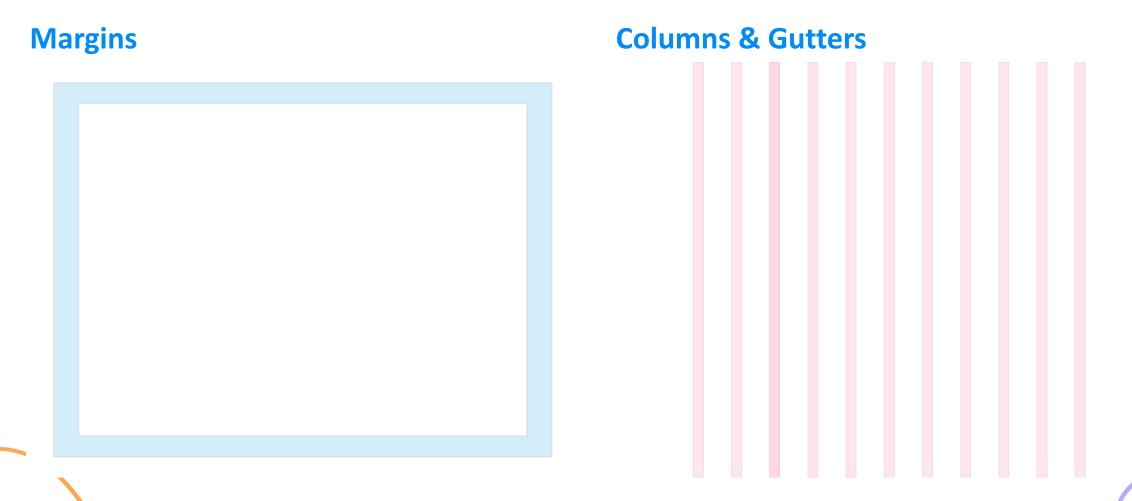
https://docs.microsoft.com/en-us/visualstudio/extensibility/ux-guidelines/layout-for-visual-studio?view=vs-2019

## Grid Layout Ingredients

- Guides: The edge which you choose to align content with
- Column: A vertical division of content
- Row: A horizontal division of content
- Margins: The area surrounding your content
- Gutters: The margins between columns
- Hang-line: A horizontal guide to align content to hang off of
- Baseline: The horizontal guide for an element to sit on top of
- **Rhythm**: Proportion systems that can help define the sizing frequency and spacing of each of the above elements.

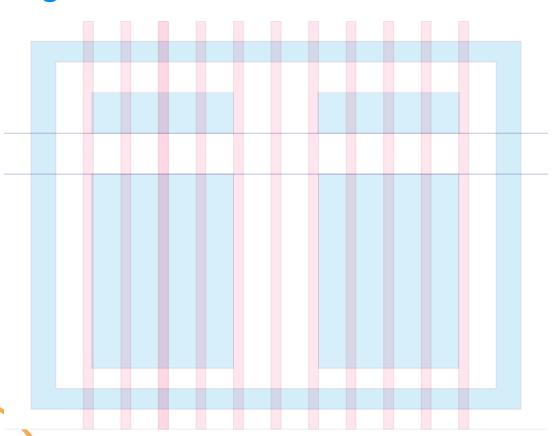


## Grid Layout Ingredients



## Grid Layout Ingredients

#### **Hanglines and Baselines**



#### **Baseline Grids**



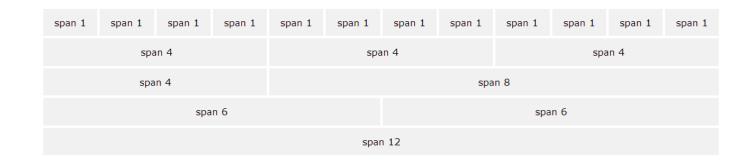
## Example of Grid-based Layout

- 1. Columns
- 2. Gutters
- 3. Margins



## Example: Bootstrap Grid

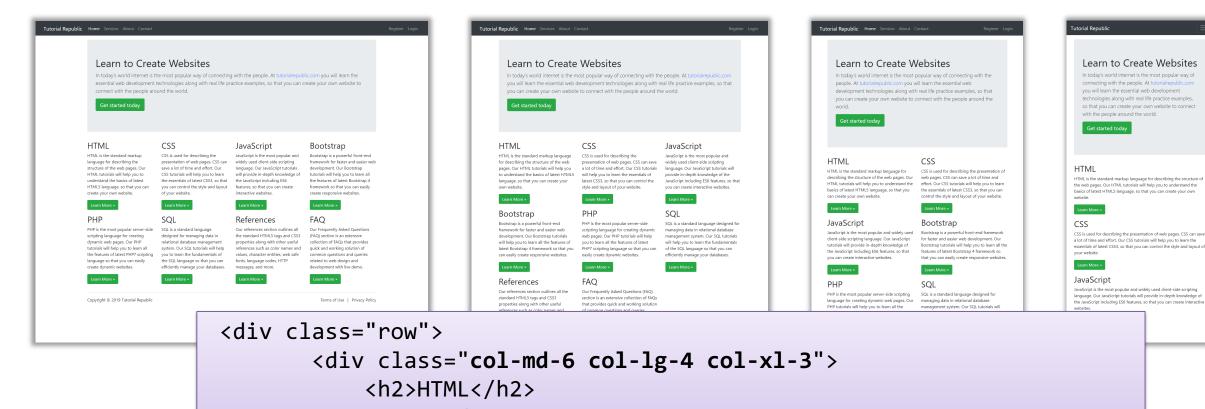
- Always 12 columns in total
- May choose to span a group of columns
- Each column is tagged according to the screen size:
  - xs (phones <768px)</li>
  - sm (tablets >=768px)
  - md (small laptops >=992px)
  - lg (laptops and desktops ->1200px)



## Example: Responsive Grid Layout

...

</div>



https://www.tutorialrepublic.com/twitter-bootstrap-tutorial/bootstrap-responsive-layout.php

<a href="..." class="btn btn-success">...</a>

### Grid Structure

Main body: Mix of 2x and 3x columns

Alternating row types



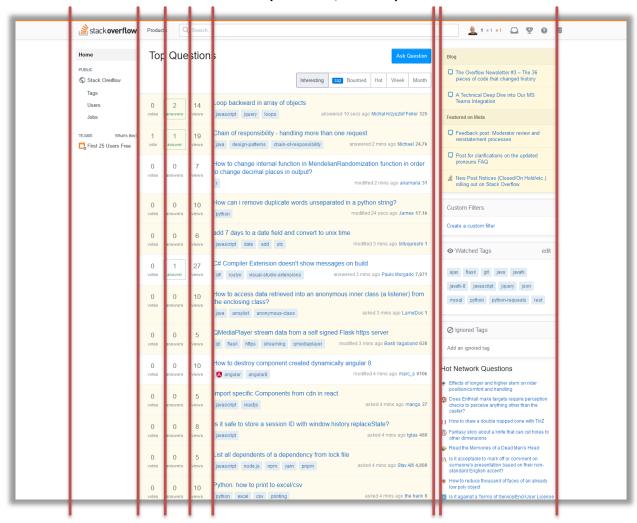
Title area outside the grid

Right column for other types of articles

### Grid Structure

## Main content (center, wide)

Navigation (left, smaller)



Related content (right, smaller)



# Example (2019)

<ul><li>Software</li></ul>							Тор
1° anno Periodo	Codice	Lingu	a Insegnamento	Crediti	Docente	Note	Vincoli
Periodo 1	01PDWOV			Crediti 6			VINCOII
1	OIPDWOV	STO	Information systems ING-INF/05 (6)		M. Morisio	$\mathbf{\otimes}$	
1	02GOLOV	100	Architetture dei sistemi di elaborazione	10	P. Bernardi	<b>∨</b>	
		- 11	ING-INF/05 (10)		E. Sanchez Sanchez		
			Oppure				
1	02LSEOV	27 PS	Computer architectures	10	P. Montuschi	$\otimes$	
		NAME OF THE OWNER, OF THE OWNER, OF THE OWNER, OF THE OWNER, OWNER, OWNER, OWNER, OWNER, OWNER, OWNER, OWNER,	ING-INF/05 (10)		0.01	0	
1	01SQJOV	200	Data Science and Database Technology ■	8	S. Chiusano	$\mathbf{\otimes}$	
			ING-INF/05 (8) Oppure				
1	01SQMOV	111	Data Science e Tecnologie per le Basi di Dati ■	8	E. Baralis	(V)	
			ING-INF/05 (8)				
1	010TWOV	50 (V)	Computer network technologies and services	6	M. Baldi	$\otimes$	
			ING-INF/05 (6)				
1	02KPNOV		Oppure	6	G. Marchetto	<b>(v)</b>	
1	UZKFNOV	•	Tecnologie e servizi di rete   ING-INF/05 (6)	0	G. Marchetto	•	
2	02JEUOV	2012	Formal languages and compilers	6	R. Sisto	<b>(</b>	
			ING-INF/05 (6)				
2	05BIDOV	111	Ingegneria del software	8	G. Bruno	$\odot$	
			ING-INF/05 (8)				
_			Oppure				
2	04GSPOV	50100	Software engineering	8	M. Morisio	$\odot$	
2	01UDFOV	11	ING-INF/05 (8) Applicazioni Web I ■	6	E. Masala	<b>(v)</b>	
-	0100.01	•	ING-INF/05 (6)		211100010		
			Oppure				
2	01TXYOV	2012	Web Applications I	6	F. Corno	$\odot$	
			ING-INF/05 (6)				
2	02GRSOV		Programmazione di sistema	10	G. Cabodi	$\otimes$	
			ING-INF/05 (10)				
2	01NYHOV	27 PM	Oppure System and device programming	10	S. Quer	<b>(</b>	
_		and	ING-INF/05 (10)				
2° anno							
Periodo	Codice	Lingu	a Insegnamento	Crediti	Docente	Note	Vincoli
1 1	01TYMOV	17171	Insegnamento a scelta 1	6 6		<b>(v)</b>	
1	UTITHOV	200	Information systems security ING-INF/05 (6)	0		•	
			Oppure Oppure				
1	01UDUOV	111	Sicurezza dei sistemi informativi	6		<b>⊗</b>	
			ING-INF/05 (6)				
1	01SQNOV	2010	Software Engineering II	6		$\mathbf{\otimes}$	
1.2			ING-INF/05 (6)	6			
1,2	29EBHOV		Crediti liberi Tesi	30			
2	ZJEDIIOV		Insegnamento a scelta 2	6			
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Periodo	Codice	Lingu		Crediti	Docente	Note	Vincoli
1	01TYDOV	2012	Cloud Computing	6		$\mathbf{\otimes}$	
1	01PDCOV	17171	ING-INF/05 (6)	6		(2)	
1	OTPDCOV	2012	<u>Digital control technologies and architectures</u> ING-INF/04 (6)	0		$\odot$	
1	01TXZOV	27195 50165	Distributed systems programming	6		<b>(</b>	Si
			ING-INF/05 (6)				
1	01NWPOV		Elaborazione dell'audio digitale	6		$\odot$	
			ING-INF/05 (6)				
1	01UDGOV	512	Energy management for IoT	6		$\mathbf{\otimes}$	Si
1	02JSKOV	27170 50170	ING-INF/05 (6)	6		A ~	
1	UZJSKUV	Sales	Human Computer Interaction ■ ING-INF/05 (6)	0		<b>%</b> 😢	
1	01SQIOV	2017) 2012	Machine Learning and Artificial Intelligence	6		<b>(</b>	
	_		ING-INF/05 (6)				
1	01PDXOV	2012	Modern design of control systems	6		$\mathbf{\otimes}$	
	0401	Name of the last	ING-INF/04 (6)				
1	010UVOV	212	Optimization methods and algorithms	6		$\odot$	
	DACETON		MAT/09 (6)	c		<u>~</u>	



# Example (same page in 2020)

<u>Software</u>								
1° anno 20	20/2021							
Periodo	Codice	SSD	Insegnamento	Lingua	Crediti	Docente	Note	Orario
1	01PDWOV	ING-INF/05 (6)	Information systems	#	6	M. Morisio (118 iscr.)		0
1	02GOLOV	ING-INF/05 (10)	Architetture dei sistemi di elaborazione	0	10	P. Bernardi (150 iscr.) E. Sanchez Sanchez (159 iscr.)		O
			oppure					
1	02LSEOV	ING-INF/05 (10)	Computer architectures	#	10	P. Montuschi (207 iscr.)		©.
1 01SQJOV	01SQJOV	ING-INF/05 (8)	Data Science and Database Technology	#	8	S. Chiusano (172 iscr.)		©
			oppure					
1	01SQMOV	ING-INF/05 (8)	Data Science e Tecnologie per le Basi di Dati	0	8	E. Baralis (254 iscr.)		©
1	01OTWOV	ING-INF/05 (6)	Computer network technologies and services	#	6	G. Marchetto (161 iscr.)		0
			oppure					
1	02KPNOV	ING-INF/05 (6)	Tecnologie e servizi di rete	0	6	G. Marchetto (253 iscr.)		©
2	02JEUOV	ING-INF/05 (6)	Formal languages and compilers	#	6	R. Sisto (60 iscr.)	<b>-</b>	<u>©</u>
2	05BIDOV	ING-INF/05 (8)	Ingegneria del software	0	8	G. Bruno (132 iscr.)		<b>©</b>
			oppure					
2	04GSPOV	ING-INF/05 (8)	Software engineering	#	8	M. Morisio (202 iscr.)		©.
2	01UDFOV	ING-INF/05 (6)	Applicazioni Web I	0	6	E. Masala (91 iscr.) L. De Russis (57 iscr.)		0
			oppure					
2	01TXYOV	ING-INF/05 (6)	Web Applications I	#	6	F. Corno (185 iscr.)		0
2 02	02GRSOV	ING-INF/05 (10)	Programmazione di sistema	0	10	G. Cabodi (100 iscr.) A. Savino (112 iscr.)	■ 🗐	0
			oppure					
2	01NYHOV	ING-INF/05 (10)	System and device programming	#	10	S. Quer (108 iscr.)		©
2° anno 20	24 (2022							
Periodo	Codice	SSD	Insegnamento	Lingua	Crediti	Docente	Note	Orario
1			Insegnamento a scelta 1		6			
1	01TYMOV	ING-INF/05 (6)	Information systems security	#	6			<u>©</u>
			oppure	•			_	
1	01UDUOV	ING-INF/05 (6)	Sicurezza dei sistemi informativi	0	6			<u>©</u>
1	01SQNOV	ING-INF/05 (6)	Software Engineering II	#	6			0
1,2			Crediti liberi	संस्	6			
1,2	29EBHOV		Tesi		30			
2			Insegnamento a scelta 2		6			

#### Some Guidelines

- When designing a template, start from the longest block of text
- Left-aligned text is (usually) faster to skim
- Alignment guides the eye and reduces clutter
  - Avoid slight misalignments
  - Patterns and deviations are "automatically" detected
    - Deviate form a pattern for strategic reasons
  - Use visual proximity and scale to convey semantic information



### **COLORS**



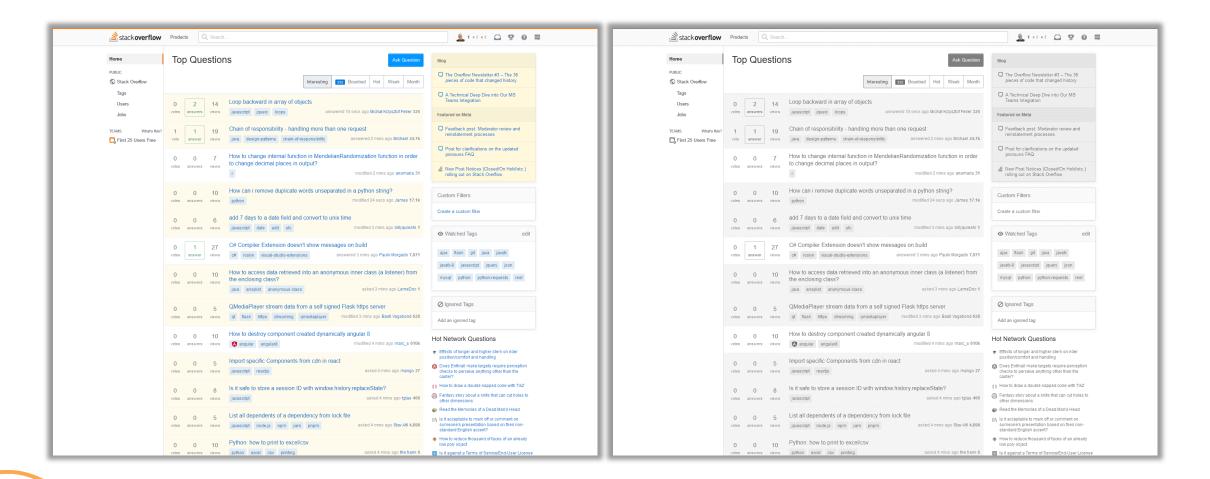


#### Colors

- Be careful, do not exaggerate
- Design in grayscale, first
  - Ensure information is conveyed by text and layout
- When adding colors, try to conserve the same luminance of the grayscale design
- Assign meaning to color
- Use a limited and consistent palette and use slight variations



## Example





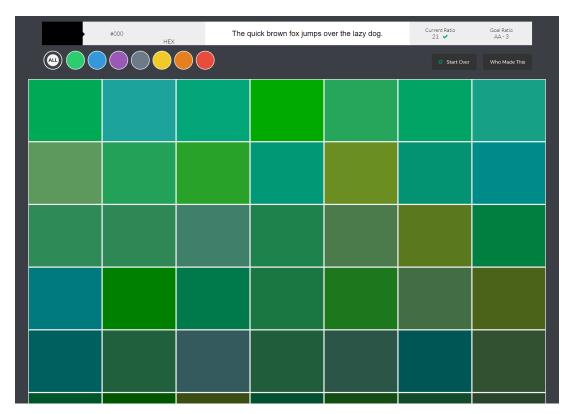
### Palettes

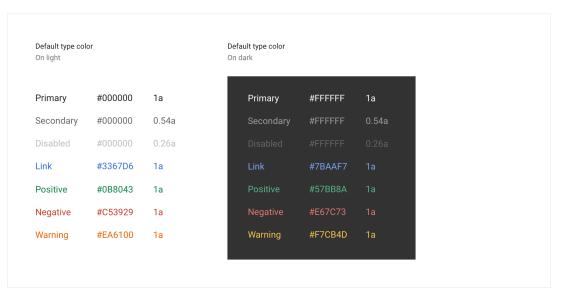




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### Color Contrast



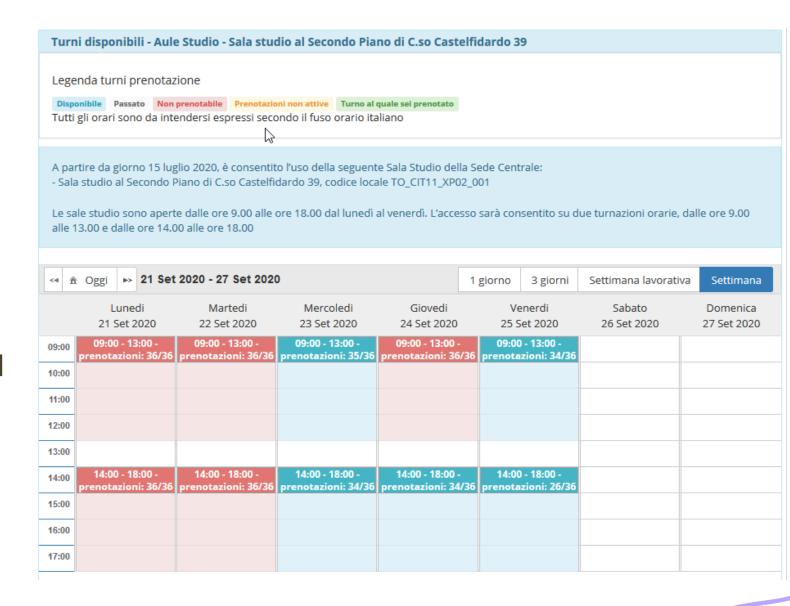


Google Chrome Palette

http://colorsafe.co/

## Example

- Colors needing an explanation legend
- Time intervals are shaded with 2 different colors
  - "why is the first hour filled with a different color?"
- No indication of the "fill level"







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