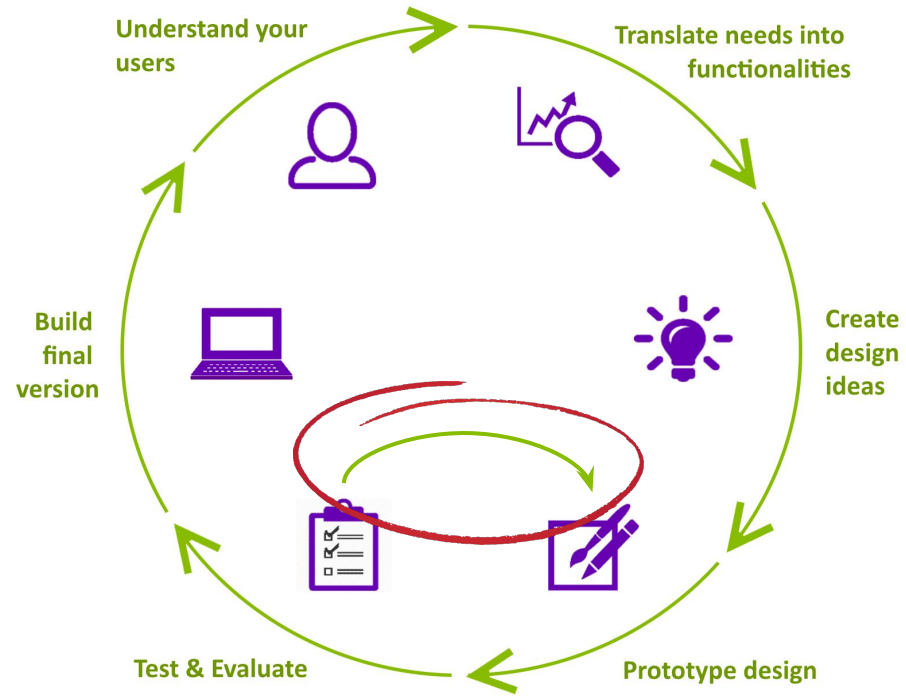


CS449/649: Human-Computer Interaction

Spring 2017

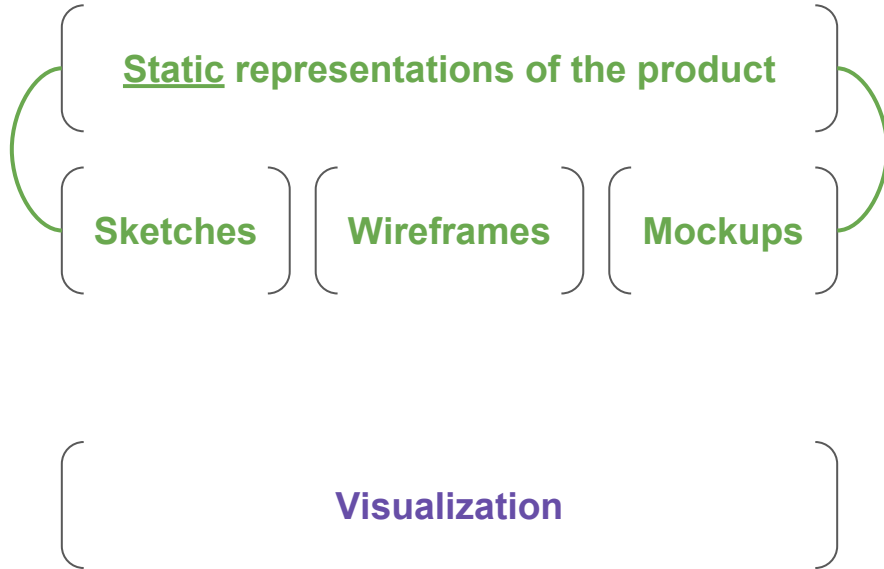
Lecture XI

Anastasia Kuzminykh

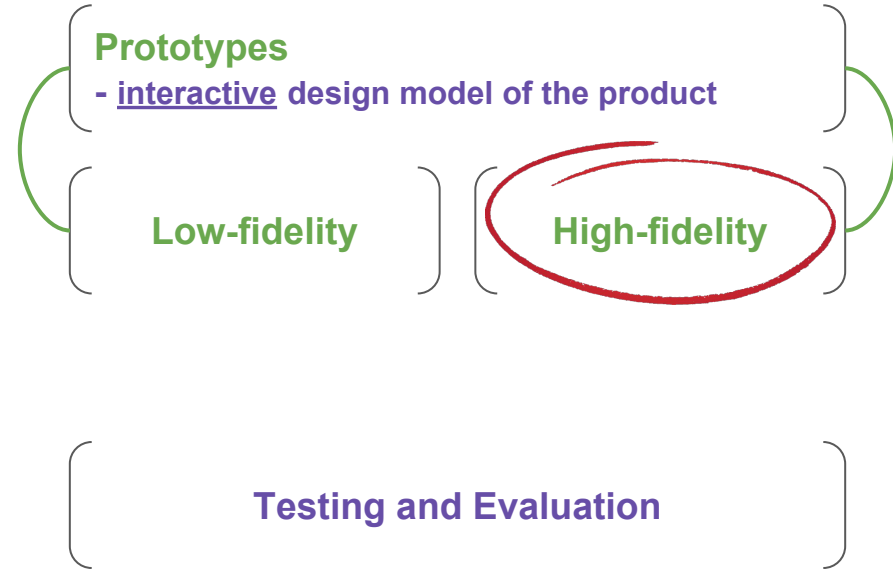




Create Design Ideas

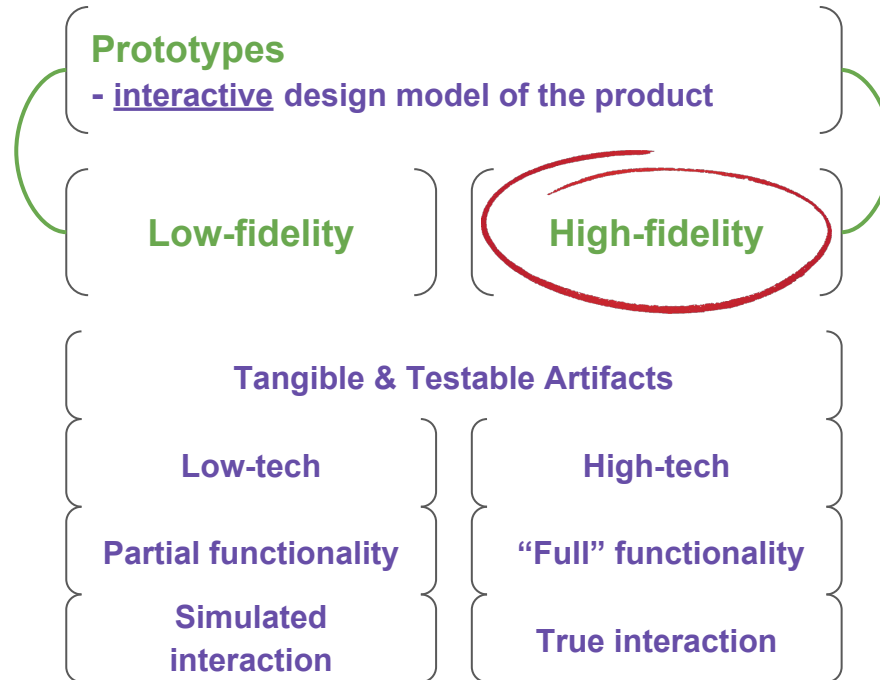


Prototype Design





Prototype Design





EatBellevue mobile app prototype designed by Daniel I Kim



iPhone RewardSnap app high-fidelity prototypes designed by Studio Science



Prototype Design

High Fidelity Prototyping Tools

Interactive

**Realistic system
response**

**Content and
workflow details**

**(Almost) Full
fidelities**

**Less human
errors**

**Allows usability
testing**



Prototype Design

High Fidelity Prototyping Tools

Implement by hand

Prototyping Software



Prototype Design

High Fidelity Prototyping Tools

Implement by hand

Prototyping Software

Whatever suits your purposes and platforms:

- jQuery, Bootstrap, AngularJS, etc.

- Android Studio, Xcode, IntelliJ IDEA, Apache Cordova, React Native, etc.

More control

More options

Takes longer

Buggy



Prototype Design

High Fidelity Prototyping Tools

Implement by hand

Whatever suits your purposes and platforms:

- jQuery, Bootstrap, AngularJS, etc.
- Android Studio, Xcode, IntelliJ IDEA, Apache Cordova, React Native, etc.

Prototyping Software

- InVision (good with mockups)
- JustInMind (has widgets)
- Axure (not mobile friendly)
- Mockplus (pre-designed interaction components)

More control

More options

Takes longer

Buggy

Faster

Sharing & comments

Outside product

Limited options



Prototype Design

Designing User Interface

Elements &
characteristics

Elements
composition

Spatial
organisation

Information
processing

Interaction

Visual Design

“Cognitive” Design



Prototype Design

Designing User Interface

**Elements &
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**Elements
composition**

**Spatial
organisation**

**Information
processing**

Interaction

Color Perception

**The Von
Restorff effect**

Rule of Thirds

Dual-coding theory

Manipulation

Shape Perception

Gestalt Principles

Types of vision

Patterns matching

Locomotion

**Visceral Reaction
Triggers**

Fitt's Law

Free space

**Social & Emotional
info**

Conversation



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Social & Emotional info

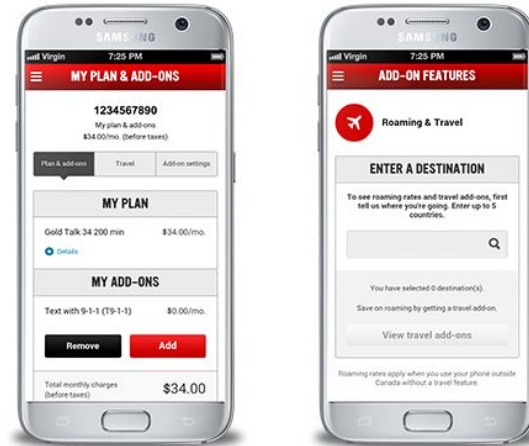
Manipulation

Locomotion

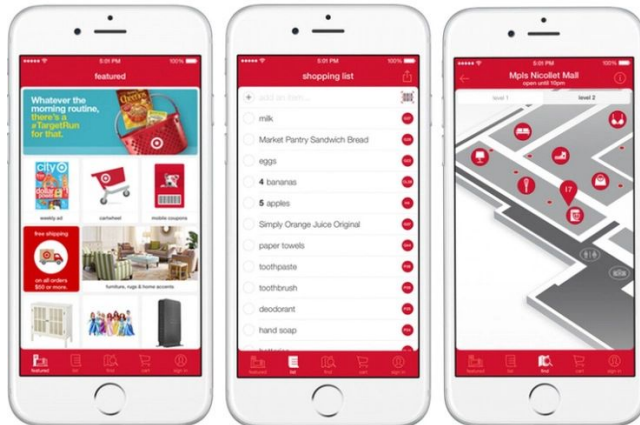
Conversation



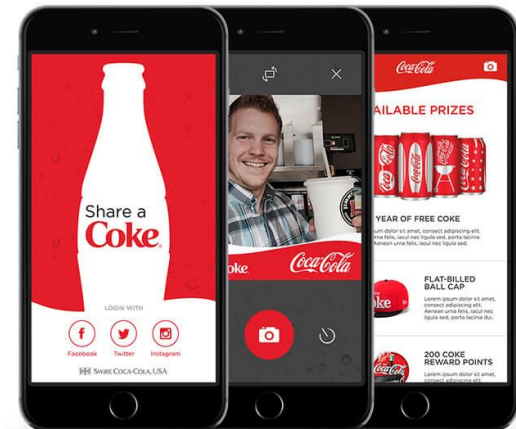
<http://lovelymobile.news/mcdonalds-to-trial-mobile-ordering-app-in-the-us/>



<http://www.virginmobile.ca/en/support/download-myaccount-app.html>



<https://techcrunch.com/2014/11/17/targets-mobile-app-gets-indoor-mapping-interactive-black-friday-maps/>



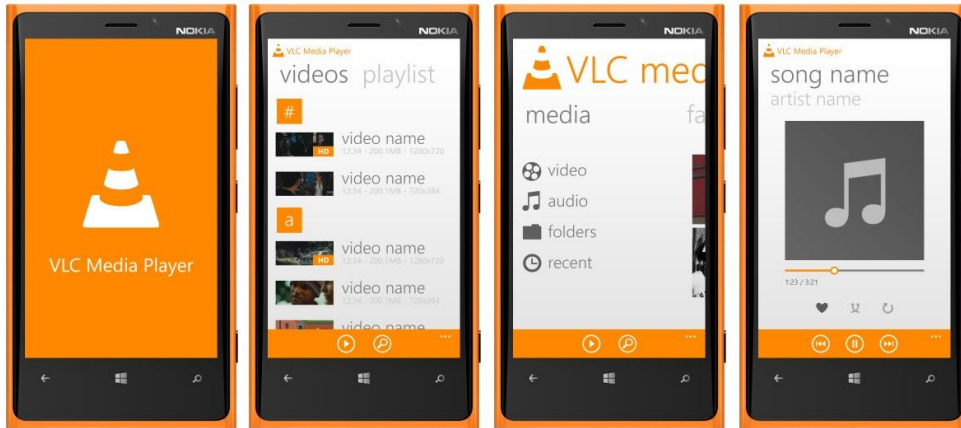
<https://www.redolive.com/cocacola>



<http://www.pierremaes.com/post/124569737015/fantaeurope>



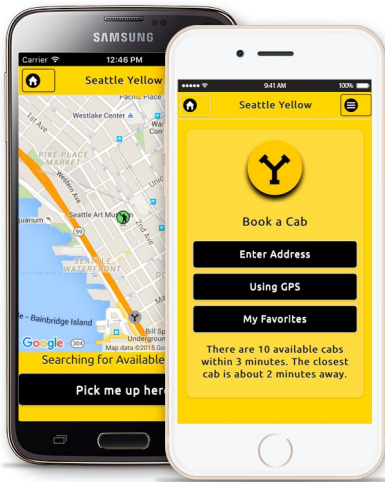
<http://www.equisense.com/en/motion.html>



<http://news.softpedia.com/news/VLC-for-Windows-Phone-Now-Available-for-Download-to-All-Beta-Testers-466616.shtml>



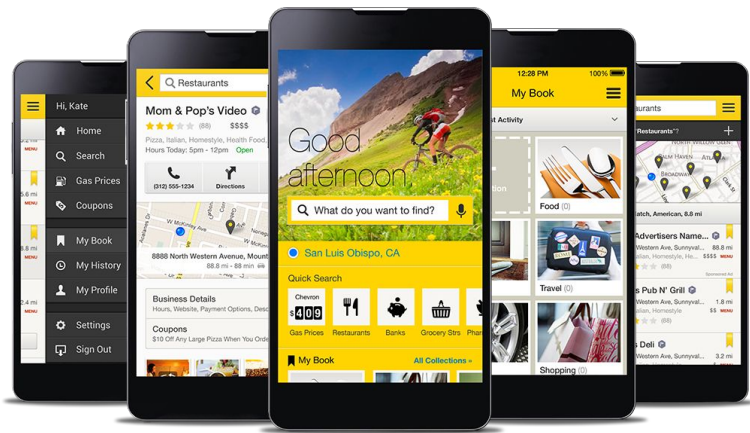
<https://dribbble.com/shots/2378228-Mobile-App-and-Mobile-website-Design>



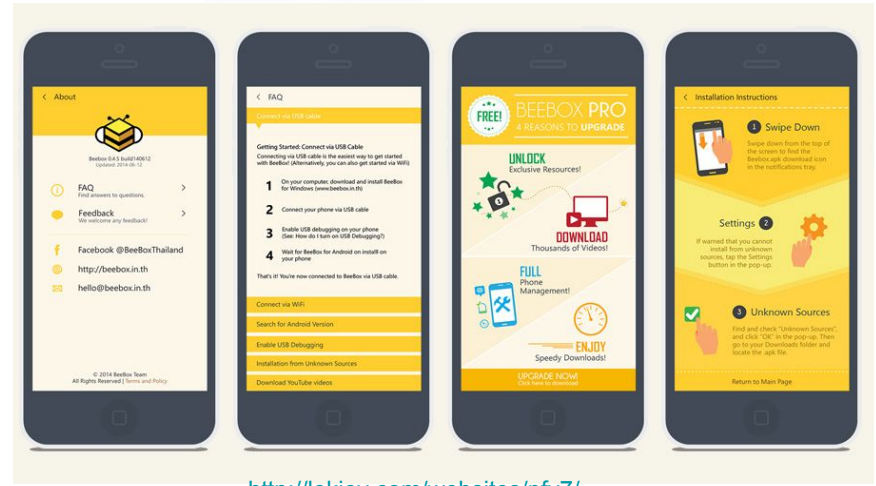
<http://www.seattleyellowcab.com/>



<https://www.westernunion.com/nz/en/mobile-app.html>



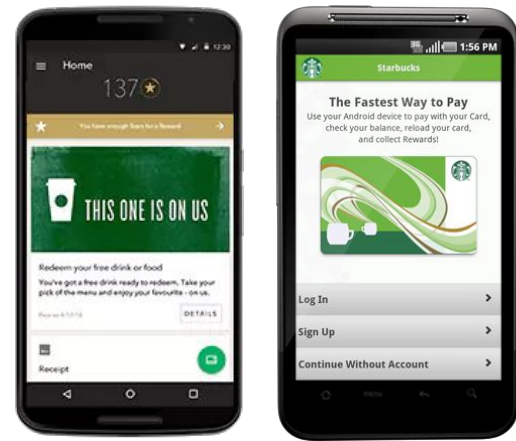
<https://www.yellowpages.com/products>



<http://lokiev.com/websites/pfv7/>



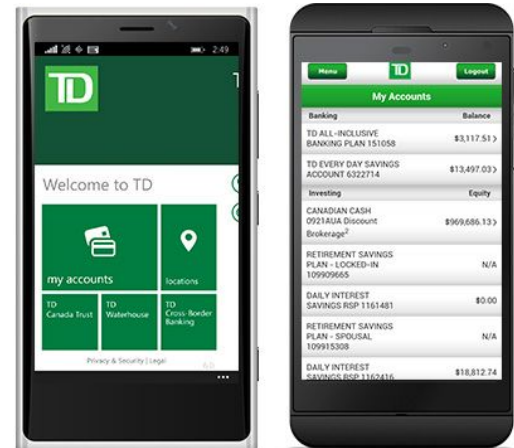
http://www.bp.com/en_gb/on-the-road/united-kingdom/find-nearest-bp/bp-app.html



<https://www.starbucks.ca/coffeehouse/mobile-apps/mystarbucks-android-app>



<http://www.webhostingreviewsbynerds.com/relieve-hunger-beautiful-examples-of-food-related-mobile-app-uis/>



<https://www.tdcanadatrust.com/products-services/banking/electronic-banking/mobile/mobile-index.jsp>



<http://appmatix.com/facebook-desktop-site-mobile/>



<https://www.cnet.com/news/walmart-expands-iphone-scan-go-app-to-200-stores/>



<http://cargocollective.com/taylorsnyder/Equine-Pfizer-Mobile-App>



http://www.ikea.com/ms/en_ID/customer-service/apps/mobile_app_14.html



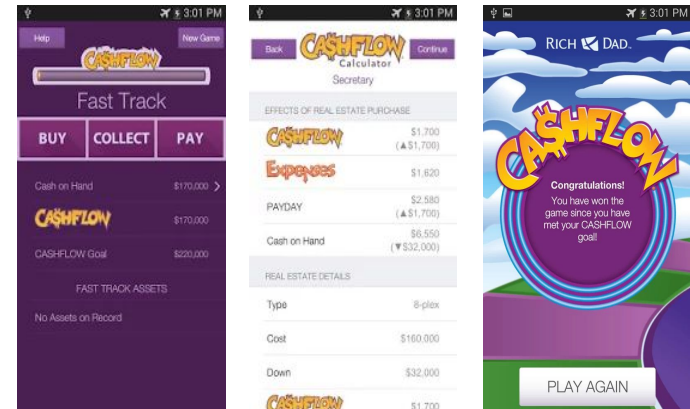
<https://www.techfoodmag.com/foodtech-12-tendencias-para-2015-y-ii/>



<http://www.mapmywalk.com/app/>



<https://play.google.com/store/apps/details?id=com.a0soft.gphone.aCurrencyPro>



<https://play.google.com/store/apps/details?id=air.com.richdad.cashflowfs>

Elements & characteristics

Elements composition

Spatial organisation

Information processing

Interaction

Color Perception

Red - bold, contemporary, exciting, passionate, young

Orange - social, friendly, affordable, happy, confident

Yellow - optimistic, clear, logical, lightweight, playful

Green - peaceful, growing, caring, fresh, healthy, natural

Blue - trustworthy, secure, strong, honest, stable, calm

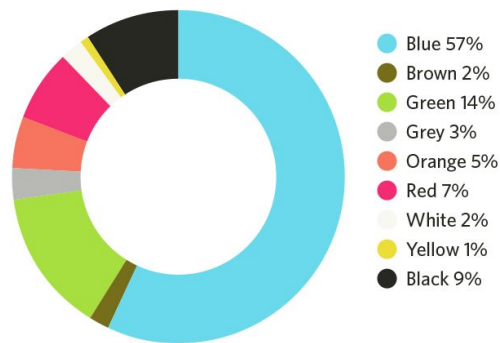
Purple - glamorous, creative, imaginative, nostalgic, feminine

COLOR EMOTION GUIDE

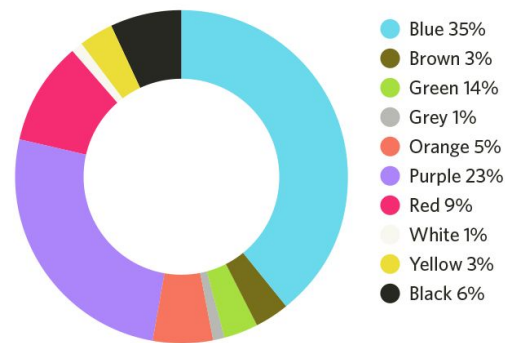


Image: [The Logo Company](#)

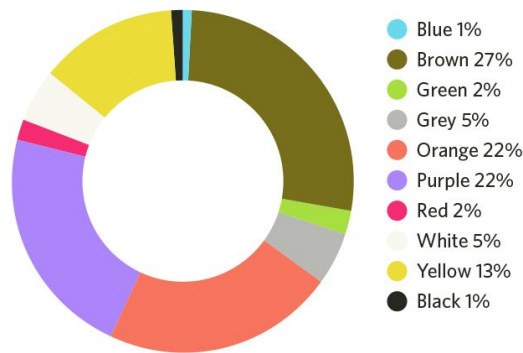
Favorite colors: Men



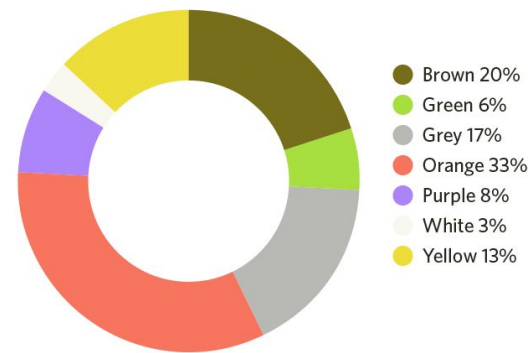
Women



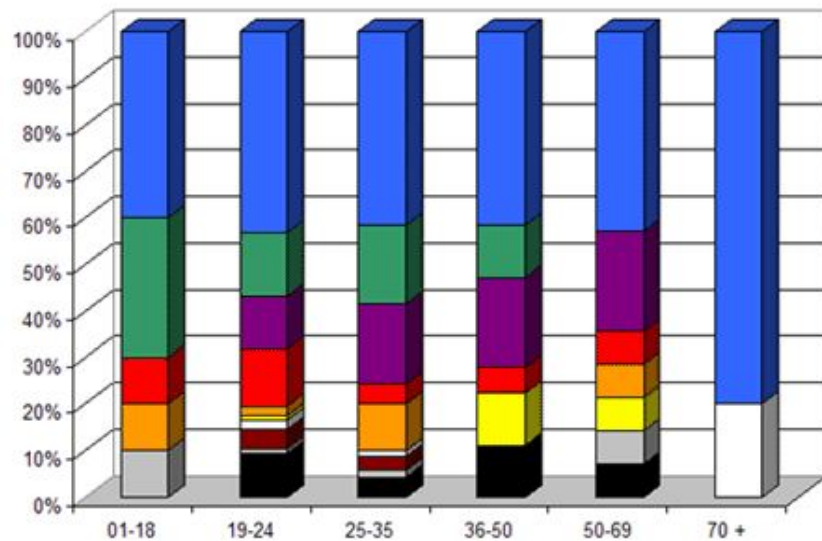
Least favorite colors: Men



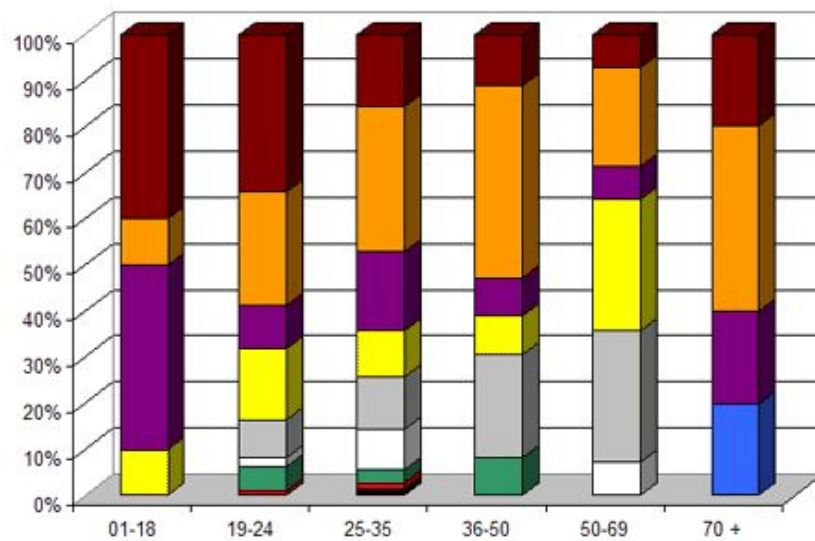
Women



Favorite Color by Age Group



Least Favorite Color by Age Group





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Rule of Thirds

Dual-coding theory

Manipulation

Shape Perception

Mholt Principles

Types of vision

Patterns matching

Locomotion

Visceral Reaction
Triggers

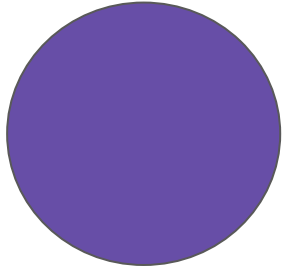
Fitt's Law

Free space

Social & Emotional
info

Conversation

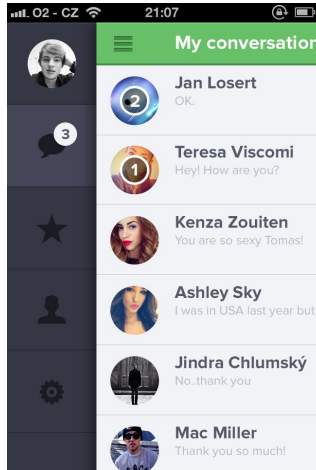




Logo examples:



Interface examples:



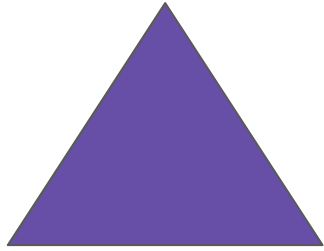
<https://dribbble.com/>



<https://guardianproject.info/>



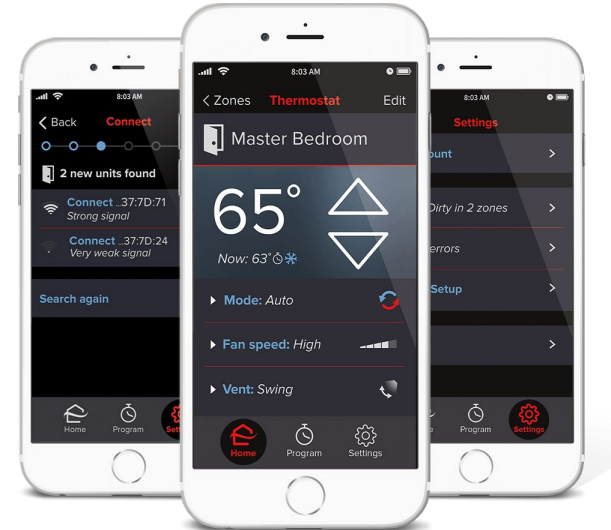
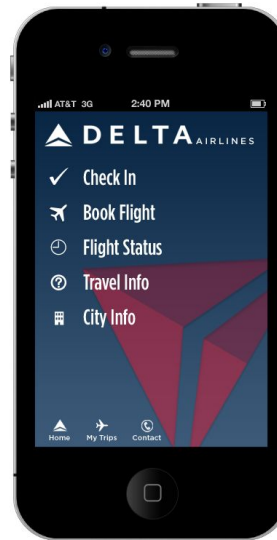
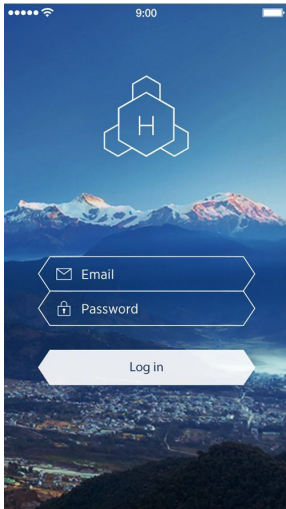
<https://www.slashgear.com/>



Logo examples:



Interface examples:



<https://www.pinterest.com/>

<http://zoominapps.com/law-app/>

<http://www.flightswatcher.com/>

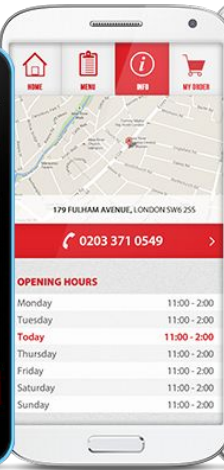
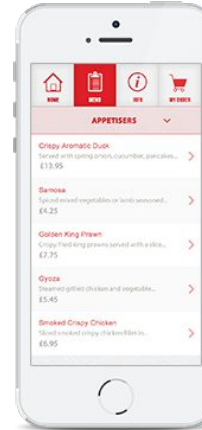
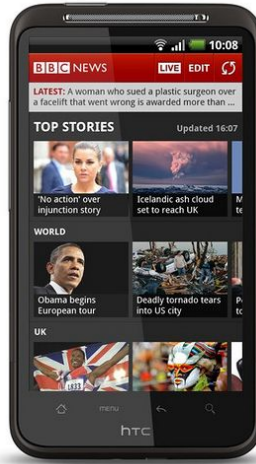
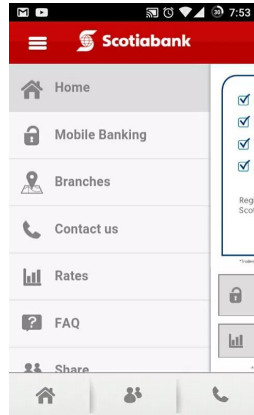
<http://www.mitsubishicomfort.com/>



Logo examples:



Interface examples:



<http://www.geeky-gadgets.com/>

<http://www.addictootech.com//>

<http://www.bbc.co.uk/>

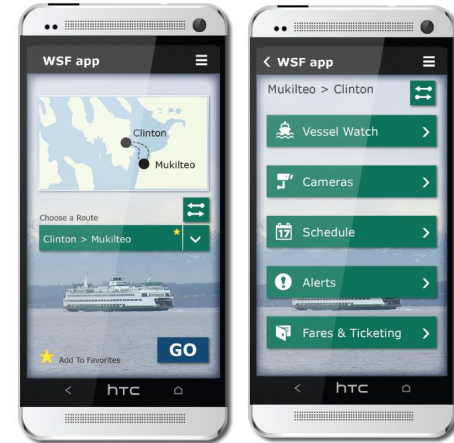
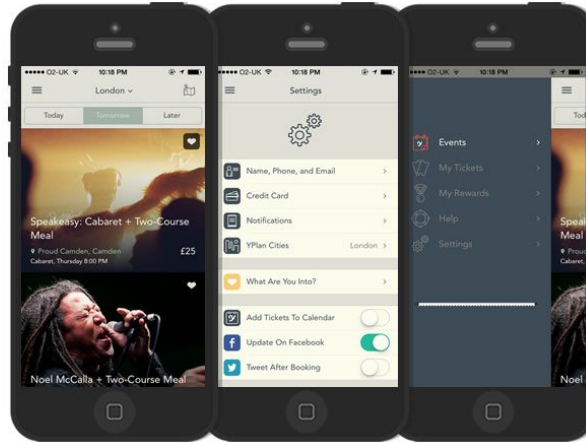
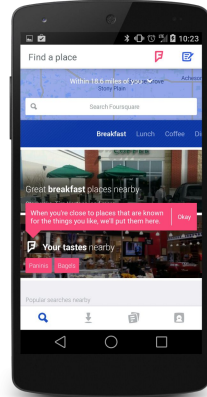
<http://www.blueplustechnologies.com/>



Logo examples:



Interface examples:

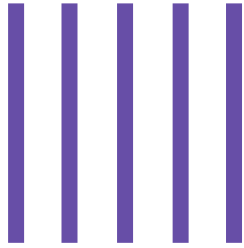


<https://designmodo.com/weather-mobile-apps/>

<http://techaeris.com/>

<https://jessteesang.wordpress.com/2014/09/17/app-review-yplan/>

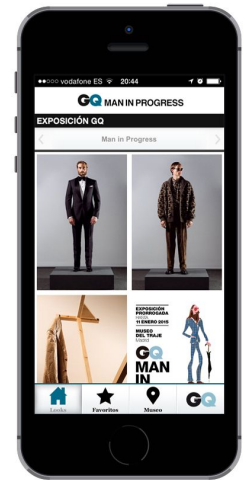
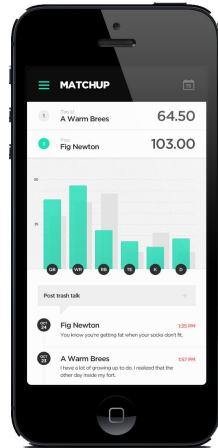
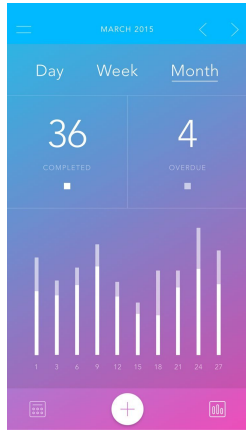
<http://www.tressarandolph.com/portfolio/project05.php>



Logo examples:



Interface examples:



<https://www.pinterest.com/>

<https://www.behance.net/gallery/>

<https://menshealth2011.wordpress.com/>

<http://www.alejandro-castro.com/>

**Elements &
characteristics**

**Elements
composition**

**Spatial
organisation**

**Information
processing**

Interaction

Shape Perception



Circles - community,
friendship, relationship,
unity, trust



Triangles - power,
science, law, stability,
strength



Squares - stability,
strength, power,
professionalism,
efficiency



Horizontal lines -
community, tranquility,
flow, continuity



Vertical lines - power,
masculinity, ambition,
aggression, strength



Prototype Design

Designing User Interface

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Dual-coding theory

Manipulation

Shape Perception

Gestalt Principles

Types of vision

Patterns matching

Locomotion

Visceral Reaction
Triggers

Mirr's Law

Free space

Social & Emotional
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Conversation

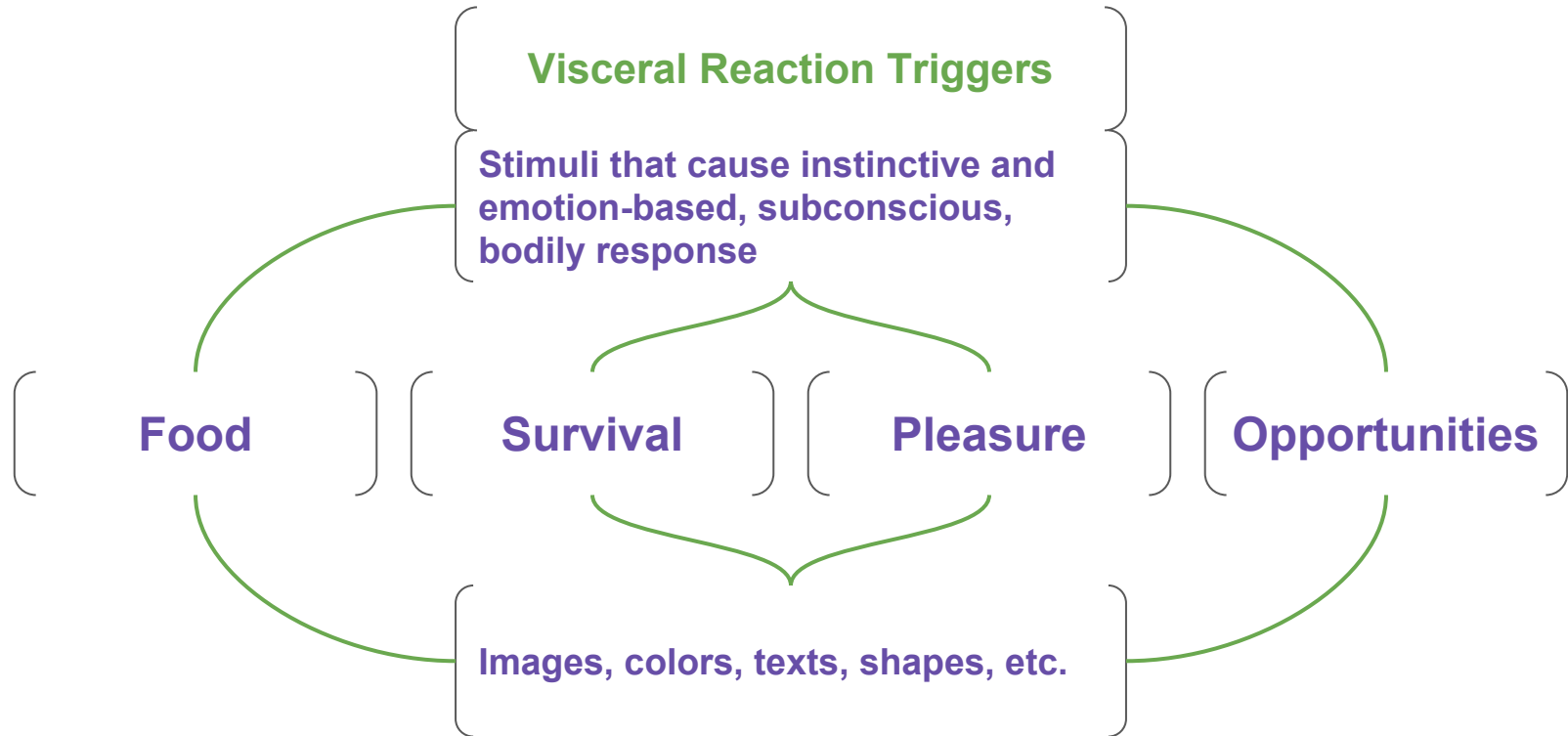
Elements & characteristics

Elements composition

Spatial organisation

Information processing

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Prototype Design

Designing User Interface

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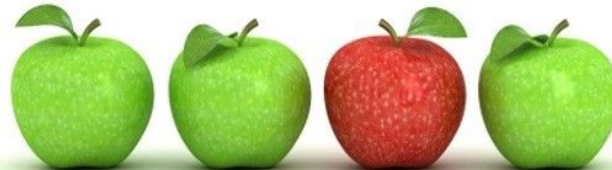
The Von Restorff Effect

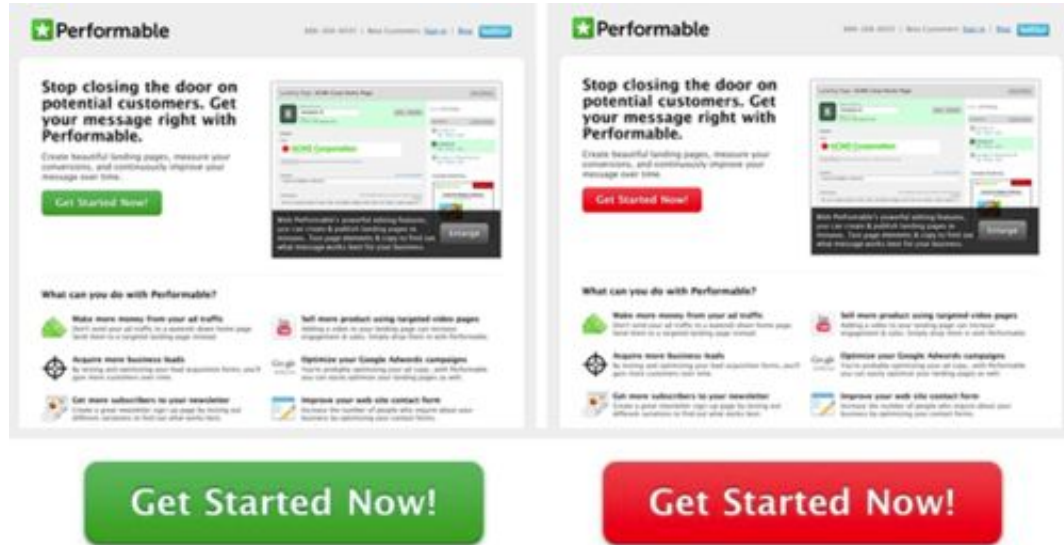
Aka **Isolation Effect**. Items that stand out from their peers are more memorable

Use meaningful and helpful contrasts

Use color, shape, position and texture for accents

Be consistent with accents and accentuated content





[The Button Color A/B Test: Red Beats Green](#)



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Elements & characteristics

Elements composition

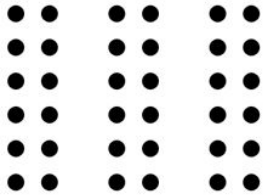
Spatial organisation

Information processing

Interaction

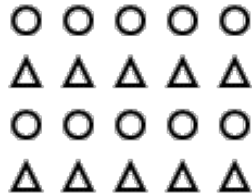
Gestalt Principles

Proximity



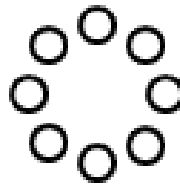
Objects in close proximity are seen as a group

Similarity



Objects that look the same are seen as a group

Closure



Shape is seen as a whole even if not fully closed

Continuity



Line is seen as a whole - natural eye movement

Symmetry



Objects are seen as symmetrical and formed around center

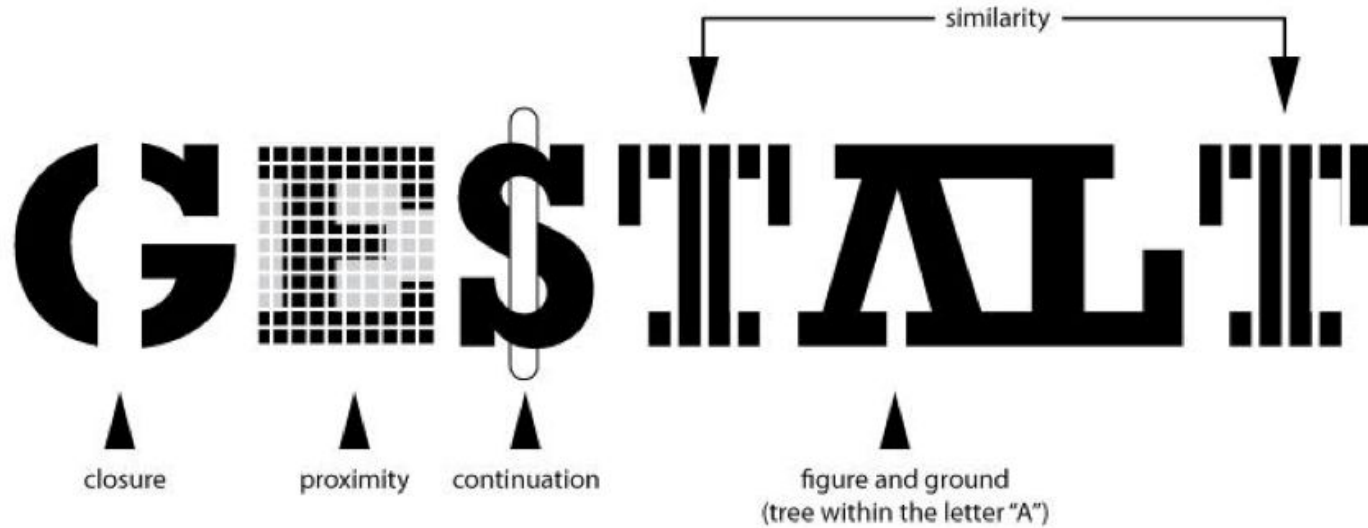
Elements &
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Elements
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Spatial
organisation

Information
processing

Interaction



Gestalt Principles for Information Design



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Elements &
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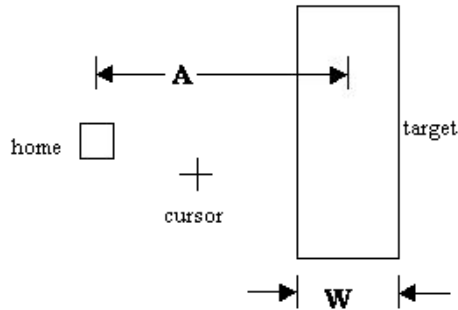
Spatial
organisation

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processing

Interaction

Fitt's Law

$$MT = a + b \log_2(2A/W)$$



- **MT** - movement time
- **a** and **b** - empirically determined constants, device dependent.
- **A** - the distance of movement from start to target center
- **W** - the width of the target
- $\log_2(2A/W)$ is called the index of difficulty (ID)

Big targets at close distance
are acquired faster than small
targets at long distance

ID provides a single combined
measure of two main physical
properties of movement tasks

Provides information only through
an experiment - a comparative tool
for devices, tasks, interaction
techniques, etc.



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Image: <http://www.nationalgeographicexpeditions.com/expeditions/yosemite-sequoia-tour/detail>



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Scene conditions with differing radii in degrees of visual angle

1°

5°

10.8°

13.6°

Window



Scotoma



Equal viewable scene area (40%)

Window

Scotoma



Larson, Adam M., and Lester C. Loschky.

"The contributions of central versus peripheral vision to scene gist recognition."

Journal of Vision 9.10 (2009): 6-6.

Elements &
characteristics

Elements
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Interaction

Types of Vision

What

Central

- Object recognition
- Element identification
- “Details” attention

Peripheral

- Scene recognition
- Context identification
- “Danger” attention

Where



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Free space

Visual - space around
graphics, icons, images

Layout - margins,
padding

Text - spacing between
lines and letters

Content - spacing
between content groups

Elements &
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Free space

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Makes important
elements stand out

Improves
comprehension

Clarifies relationship
through proximity



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Dual Coding Theory - human memory operates both with verbal representations and mental images, when both potentiate recall of each other

Allan Paivio, University of Western Ontario, 1971

Text

vs

Images

- Slower
- Verbal message

- Faster
- Illustrating idea

Combine.

Use not just images and diagrams, but infographics, visual cues, framing, etc.



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Patterns matching

Emotion

Visceral Reaction
Triggers

Fitt's Law

Free space

Social & Emotional
info

Conversation



Elements &
characteristics

Elements
composition

Spatial
organisation

Information
processing

Interaction

Patterns Matching - the way of
processing incoming information



- Based on previous experience
- Assesses familiarity
- Stimuli that are difficult to match can be more memorable, but also frustrating



Prototype Design

Designing User Interface

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Color Perception

The Von
Restorff effect

Rule of Thirds

Dual-coding theory

Manipulation

Shape Perception

Gestalt Principles

Types of vision

Patterns matching

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Social & Emotional Information

Facial Recognition

- We are instinctively drawn to human faces
- Aggressive and unhappy faces draw more attention
- Expression on the face will influence user's feelings about the product

Authority

- We trust experts and those who have power

Scarcity

- The less available the resource, the more we want it

Reciprocation & Favoritism

- We recognize favors and try to return them
- The more we like people, the more we want to say yes

Social Proof Seeking

Robert B. Cialdini, The Science of Compliance



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Types of Interaction

Terry Winograd

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“Back-end”

Mental Modal

Technology based

Metaphorical

Often hidden mechanisms

Reflected in vocabulary

Dependent on embodiment