Prototype Design

- Interactive design model of the product
  - Low-fidelity
  - High-fidelity

Create Design Ideas

- Sketches
- Wireframes
- Mockups

Testing and Evaluation

Visualization
Prototype Design

Prototypes
- Interactive design model of the product

Low-fidelity

High-fidelity

Tangible & Testable Artifacts

Low-tech
- Partial functionality
  - Simulated interaction

High-tech
- "Full" functionality
  - True interaction
Prototype Design

High Fidelity Prototyping Tools

- Interactive
- (Almost) Full fidelities

- Realistic system response
- Less human errors

- Content and workflow details
- Allows broader usability testing
Prototype Design

High Fidelity Prototyping Tools

- Implement by hand
- Prototyping Software
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

- 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
Prototype Design

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Visual Design

“Cognitive” Design
Prototype Design

Designing User Interface

Elements & characteristics
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Interaction
- The Von Restorff effect
- Rule of Thirds
- Dual-coding theory
- Manipulation

Elements composition
- Color Perception
  - Shape Perception
  - Visceral Reaction Triggers
  - The Von Restorff effect
- Gestalt Principles
  - Fitts’ Law
- Rule of Thirds
- Types of vision
- Patterns matching

Spatial organisation
- Free space
- Social & Emotional info

Information processing
- Designing User Interface
- Conversation
- Locomotion
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
Favorite colors:

Men:
- Blue: 57%
- Brown: 2%
- Green: 14%
- Grey: 3%
- Orange: 5%
- Red: 7%
- White: 2%
- Yellow: 9%
- Black: 9%

Women:
- Blue: 35%
- Brown: 3%
- Green: 14%
- Grey: 1%
- Orange: 5%
- Purple: 23%
- Red: 9%
- White: 1%
- Yellow: 3%
- Black: 6%

Least favorite colors:

Men:
- Blue: 1%
- Brown: 27%
- Green: 2%
- Grey: 5%
- Orange: 22%
- Purple: 22%
- Red: 2%
- White: 5%
- Yellow: 13%
- Black: 1%

Women:
- Brown: 20%
- Green: 6%
- Grey: 17%
- Orange: 33%
- Purple: 8%
- Red: 2%
- White: 3%
- Yellow: 13%

Image: https://www.helpscout.net/blog/psychology-of-color/
Prototype Design

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Designing User Interface

Gestalt Principles
Logo examples:

Disney  |  Olympic Rings  |  MasterCard  |  Pinterest  |  Wikipedia  |  Nivea

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:

- Cisco
- SoundCloud
- Elle
- Adidas
- Viracón

Interface examples:

- https://www.pinterest.com/
- https://www.behance.net/gallery/
- http://www.alejandro-castro.com
Elements & characteristics

**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

Elements & characteristics
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Manipulation

Conversation

Locomotion
Visceral Reaction Triggers

- Stimuli that cause instinctive and emotion-based, subconscious, bodily response

Food
Survival
Pleasure
Opportunities

Images, colors, texts, shapes, etc.
The Von Restorff Effect

== 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

Image: https://www.en.sitew.com/How-to-grow-your-online-business/Von-Restorff-effect-to-increase-sales
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Elements & characteristics

Composition

Gestalt Principles

Proximity

Similarity

Closure

Continuity

Symmetry

Objects in close proximity are seen as a group

Objects that look the same are seen as a group

Shape is seen as a whole even if not fully closed

Line is seen as a whole - natural eye movement

Objects are seen as symmetrical and formed around center
Gestalt Principles for Information Design
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Fitts' Law

\[ MT = a + b \log_2 \left( \frac{2A}{W} \right) \]

- \( MT \) - 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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Visceral Reaction triggers

Fitts’ Law

Visceral Reaction triggers

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Types of vision
Types of Vision

Central
- Object recognition
- Element identification
- “Details” attention

Peripheral
- Scene recognition
- Context identification
- “Danger” attention

What

Where
Prototype Design

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Spatial organisation

Elements & characteristics

Elements composition

Content - spacing between content groups

Text - spacing between lines and letters

Layout - margins, paddings

Visual - space around graphics, icons, images

Free space

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Elements composition

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Interaction
Interaction

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Free space

- Makes important elements stand out
- Improves comprehension
- Clarifies relationship through proximity

- Visual - space around graphics, icons, images
- Layout - margins, paddings
- Text - spacing between lines and letters
- Content - spacing between content groups
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
- Slower
- Verbal message

VS

Images
- Faster
- Illustrating idea

Combine.
Use not just images and diagrams, but infographics, visual cues, framing, etc.
Plan Heading Structure Early
Ensure all content and design fits into a logical heading structure.

Consider Reading Order
The reading order should be the same as the visual order.

Provide Good Contrast
Be especially careful with light shades of gray, orange, and yellow. Check your contrast levels with our color contrast checker.

Use True Text Whenever Possible
True text enlarges better, loads faster, and is easier to translate. Use CSS to add visual style.
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Fitts’ Law
Rule of Thirds
Dual-coding theory
Social & Emotional info
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
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
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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

- **Manipulation**
- **Locomotion**
- **Conversation**

**“Back-end”**
- Technology based
- Often hidden mechanisms

**Mental Model**
- Metaphorical
- Reflected in vocabulary
- Dependent on embodiment

_Terry Winograd_
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