Prototype Design

Create Design Ideas
- Static representations of the product
  - Sketches
  - Wireframes
  - Mockups
- Visualization

Prototype Design
- Prototypes - interactive design model of the product
  - Low-fidelity
  - High-fidelity
- Testing and Evaluation
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
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

More control

More options

Takes longer

Buggy

Whatever suits your purposes and platforms:

- jQuery, Bootstrap, AngularJS, etc.
- Android Studio, Xcode, IntelliJ IDEA, Apache Cordova, React Native, etc.
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 & characteristics
  - Color Perception
  - Shape Perception
  - Visceral Reaction Triggers
- Elements composition
  - The Von Restorff effect
  - Gestalt Principles
  - Fitt’s Law
- Spatial organisation
  - Rule of Thirds
  - Types of vision
  - Free space
- Information processing
  - Dual-coding theory
  - Patterns matching
  - Social & Emotional info
- Interaction
  - Manipulation
  - Locomotion
  - Conversation


https://www.redolive.com/cocacola


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

http://appamatix.com/facebook-desktop-site-mobile/


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

**Elements & characteristics**

- **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

OPTIMISM  CLARITY  WARMTH
FRIENDLY  CHEERFUL  CONFIDENCE
EXCITEMENT  YOUTHFUL  BOLD
CREATIVE  IMAGINATIVE  WISE
TRUST  DEPENDABLE  STRENGTH
PEACEFUL  GROWTH  HEALTH
BALANCE  INFINITY  CALM

Image: The Logo Company
Favorite colors:

- Men:
  - Blue: 57%
  - Brown: 2%
  - Green: 14%
  - Grey: 3%
  - Orange: 5%
  - Red: 7%
  - White: 2%
  - Yellow: 1%
  - 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%

Color preferences by Joe Hallock

Image: https://www.helpscout.net/blog/psychology-of-color/
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Color Perception
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Prototype Design
Logo examples:

Disney  Olympic Games  MasterCard  Pinterest  Wikipedia  Nivea

Interface examples:

https://dribbble.com/

https://guardianproject.info/

https://www.slashgear.com/
Logo examples:

Interface examples:

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/
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

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Elements composition

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Visceral Reaction Triggers

- Color Perception
- Shape Perception
- Visceral Reaction Triggers
Visceral Reaction Triggers

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

- Food
- Survival
- Pleasure
- Opportunities

Images, colors, texts, shapes, etc.

Elements & characteristics
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

Image: https://www.en.sitew.com/How-to-grow-your-online-business/Von-Restorff-effect-to-increase-sales
The Button Color A/B Test: Red Beats Green
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
Gestalt Principles for Information Design
Fitt’s 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.
Rule of Thirds

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Information processing

Spatial organisation

Elements & characteristics

Elements composition

Interaction

Types of Vision

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

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

What

Where

Scene recognition

Context identification

“Danger” attention

Object recognition

Element identification

“Details” attention

What

Where
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Free space

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

**Spatial organisation**
**Elements & characteristics**

**Spatial organisation**

**Information processing**

**Interaction**

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**Free space**

**Visual** - space around graphics, icons, images

**Layout** - margins, paddings

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**Makes important elements stand out**

**Improves comprehension**

**Clarifies relationship through proximity**
**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

- **Images**
  - Faster
  - Illustrating idea

*Combine.*

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

Manipulation

Conversation
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
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Information processing:
- Conversation

Manipulation:
- Locomotion
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

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

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

Social Proof Seeking

Robert B. Cialdini, *The Science of Compliance*
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Information processing

Spatial organisation

Elements composition

Elements & characteristics

Types of Interaction

Terry Winograd

Manipulation

Locomotion

Conversation

“Back-end”

Mental Modal

Technology based

Metaphorical

Often hidden mechanisms

Reflected in vocabulary

Dependent on embodiment