CS449/649:
Human-Computer Interaction
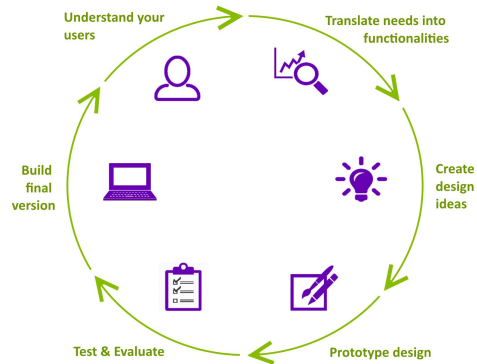
Spring 2017

Lecture XXII

Anastasia Kuzminykh

User Centered Design Process
May 1 - June 14

Understand your users

Translate needs into functionalities

Create design ideas

Prototype design

Test & Evaluate

Build final version

History of user centered design in HCI
June 19, June 21

Academic HCI
June 26, June 28

Special topics in HCI
July 5, July 10

Course Review
July 12, July 17

Presentation 2
July 19

Last class
July 24

Course Review

User Centered Design Process
May 1 - June 14

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Course Review

Value Proposition

Understand your users

Translate needs into functionalities
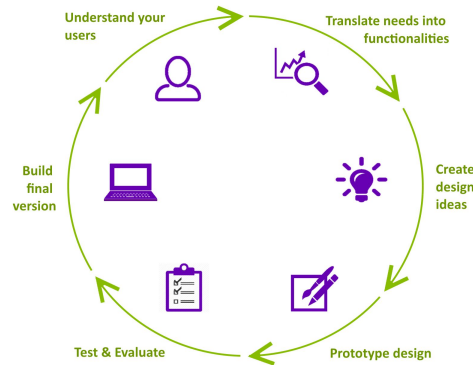
Create design ideas

Create Design Ideas

Create Ideas
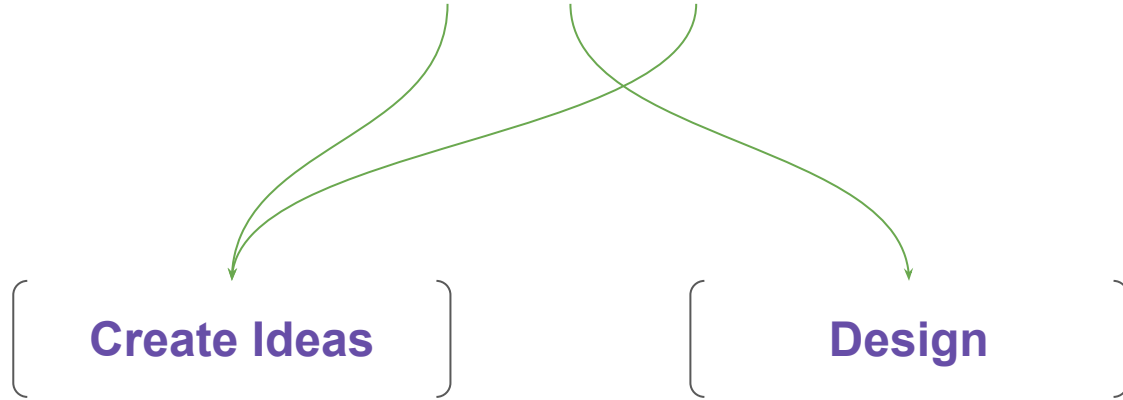
Design

Create Design Ideas

Create Ideas

Creativity - process of producing a new idea which has value to someone

Nature   vs   **Nurture**

Generating ideas: memories → ordinary → extraordinary

Create Design Ideas
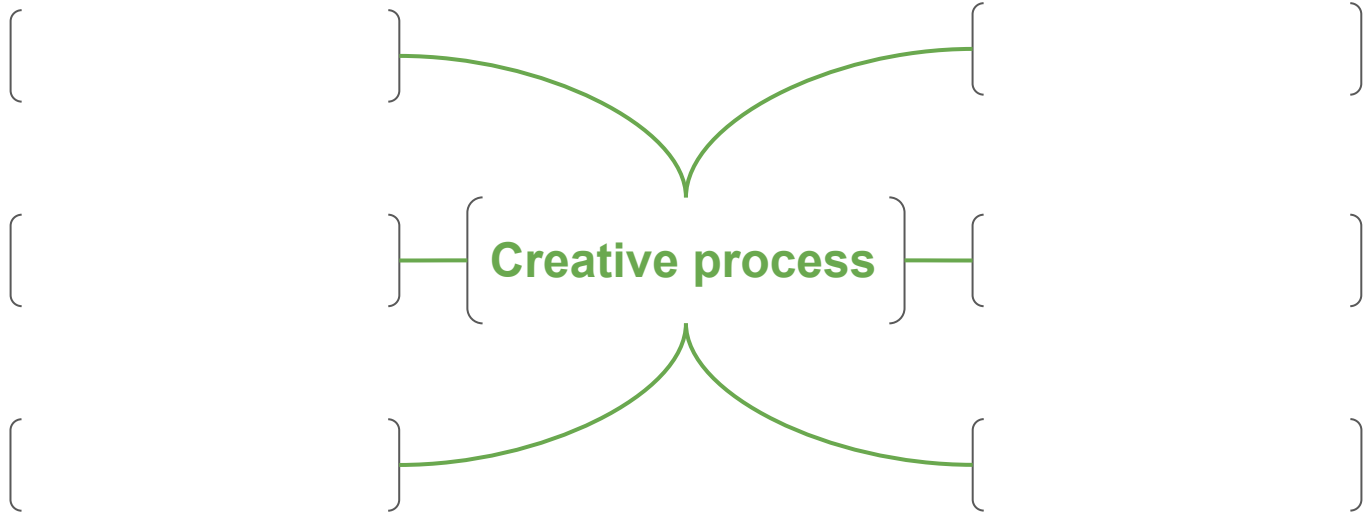
Create Ideas

Creative process

Create Design Ideas

Create Ideas

1. Preparation

4. Eureka moment

2. Provocation

Creative process

5. Verification

3. Incubation

6. Realization

Create Design Ideas

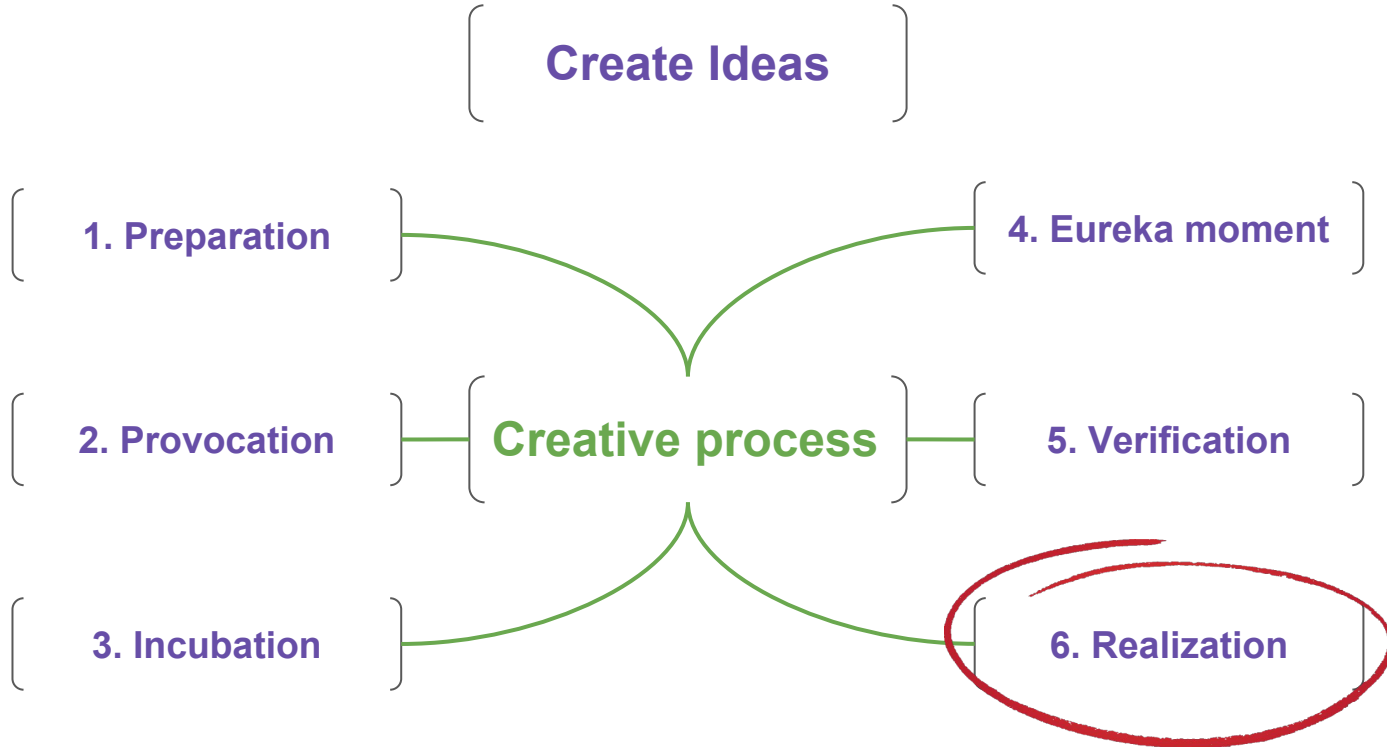Create Ideas

1. Preparation

4. Eureka moment

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Creative process

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Create Design Ideas
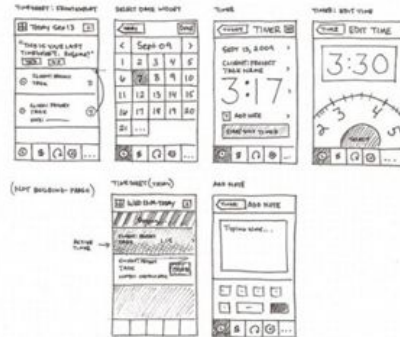
Sketches
- illustration of how the basic concept works

The idea translated into user interface form.

User stories
- description of a feature from an end-user perspective

As a user / <persona> ,
I want / need <action>
so that I can <user goal>.

Wireframes
- static representation of the UI layout and user flow

Wireframe

Mockup

city

tem

week
buttons

detailed
info

wind
speed +
direction

MADRID

low   high

// sunny

23°

TUE   WED   THU   FRI   SAT

CURRENT

Humidity: 47%
Visibility: Moderate
Chance of Rain: 70%
Precipitation: 4mm

Wind Direction: SW
Wind Speed: 23mph
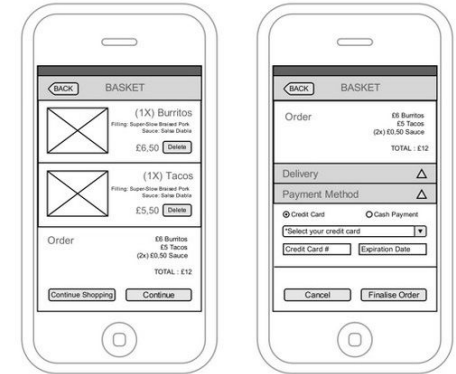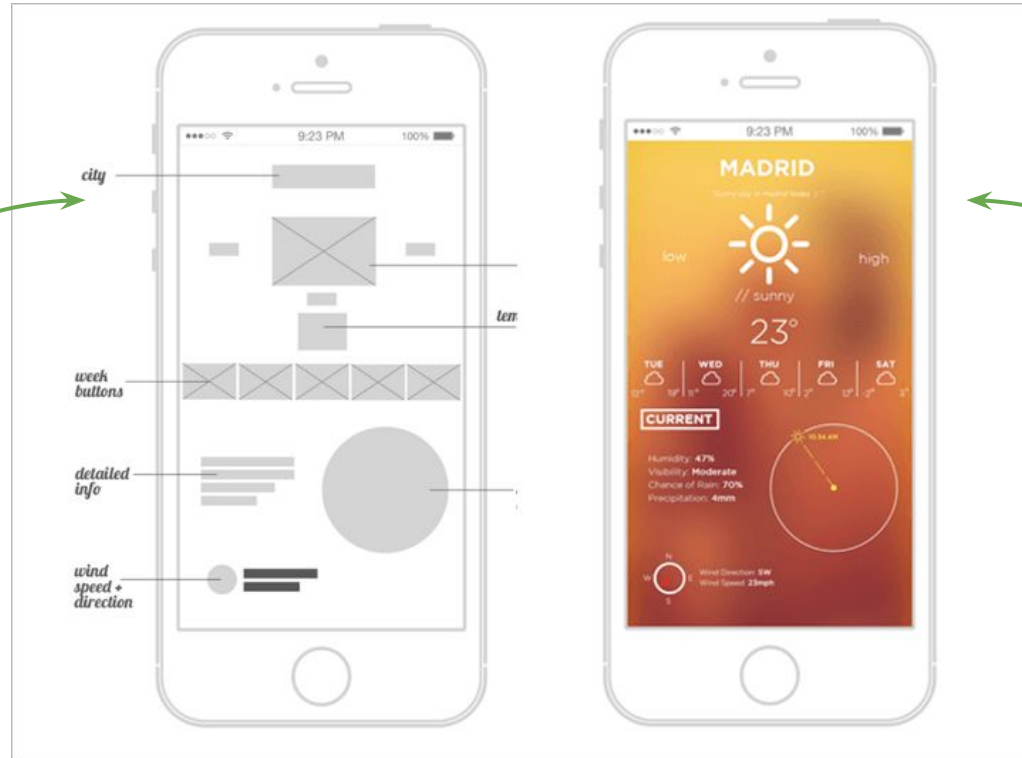
Matt Sclarandis's Weather App Wireframe on Behance

Create Design Ideas

Design

Interface - a surface/place where two independent systems, bodies or spaces meet / form a common boundary, and communicate with each other

Interface - a communication channel

Communication - exchanging of information

Create Design Ideas

Design

Semiotics - the study of signs and symbols

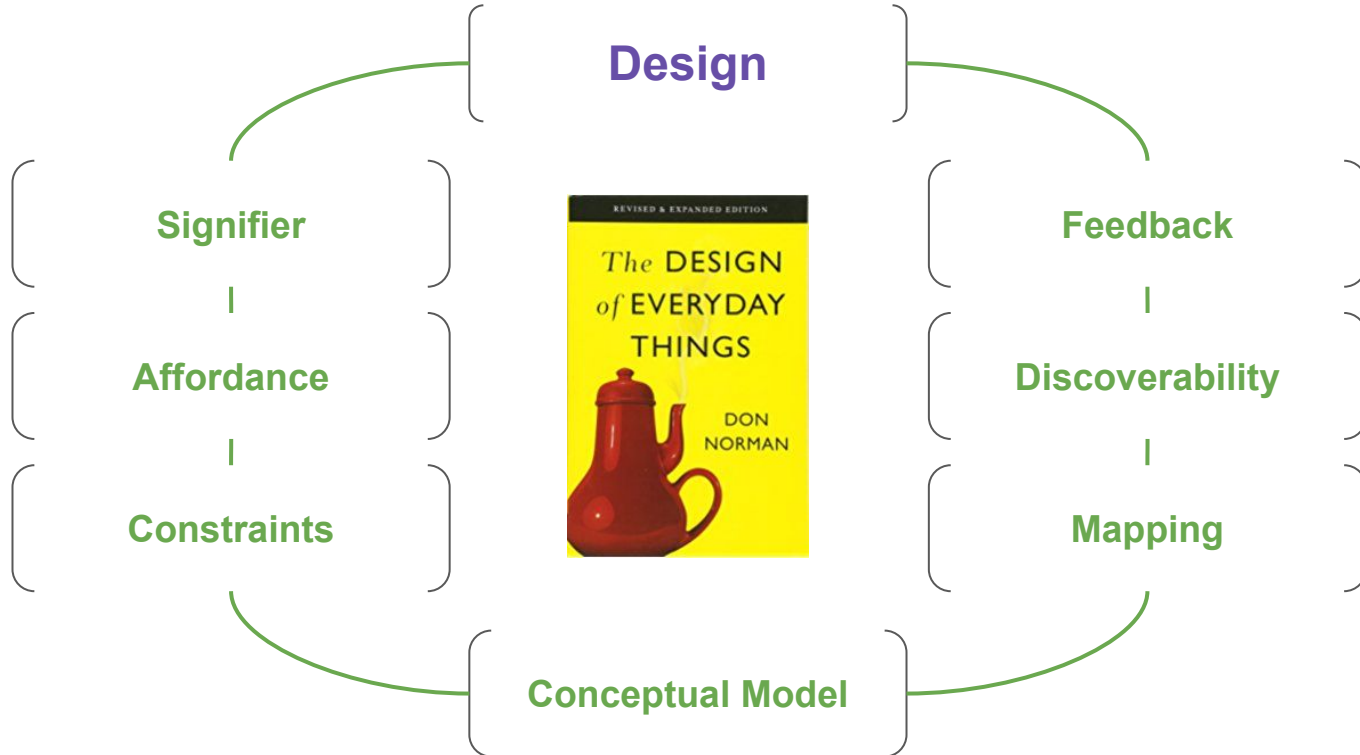**Sign** - anything that communicates a meaning

Representamen (signifier) - the form of the sign

Interpretant - what people make of the sign

Object (signified) - the actual reference of the sign

Create Design Ideas

Design

Signifier

Affordance

Constraints

The DESIGN of EVERYDAY THINGS

DON NORMAN

REVISED & EXPANDED EDITION

Feedback

Discoverability

Mapping

Conceptual Model

Create Design Ideas

Design

Signifier - indicators of any type that communicate the action needed so the affordance can take place

Feedback - conveys effects of user's actions

Affordance - the possible use for an object when interacting with it

Discoverability - whether it's possible to figure out how to use an object by interacting with it

Constraints - restrictions that limit the possible actions available with an object

Mapping - indication of the relationship between objects

Conceptual Model - user's understanding of how the system works

Create Design Ideas

Design

Signifier - indicators of any type that communicate the action needed so the affordance can take place

Affordance - the possible use for an object when interacting with it

Constraints - restrictions that limit the possible actions available with an object

Physical - caused by physical features

Cultural - based on what is culturally accepted

Semantic - based on the meaning of the situation

Logical - use reasoning to determine the alternatives

Create Design Ideas

Design

Signifier - indicators of any type that communicate the action needed so the affordance can take place

Affordance - the possible use for an object when interacting with it

Constraints - restrictions that limit the possible actions available with an object

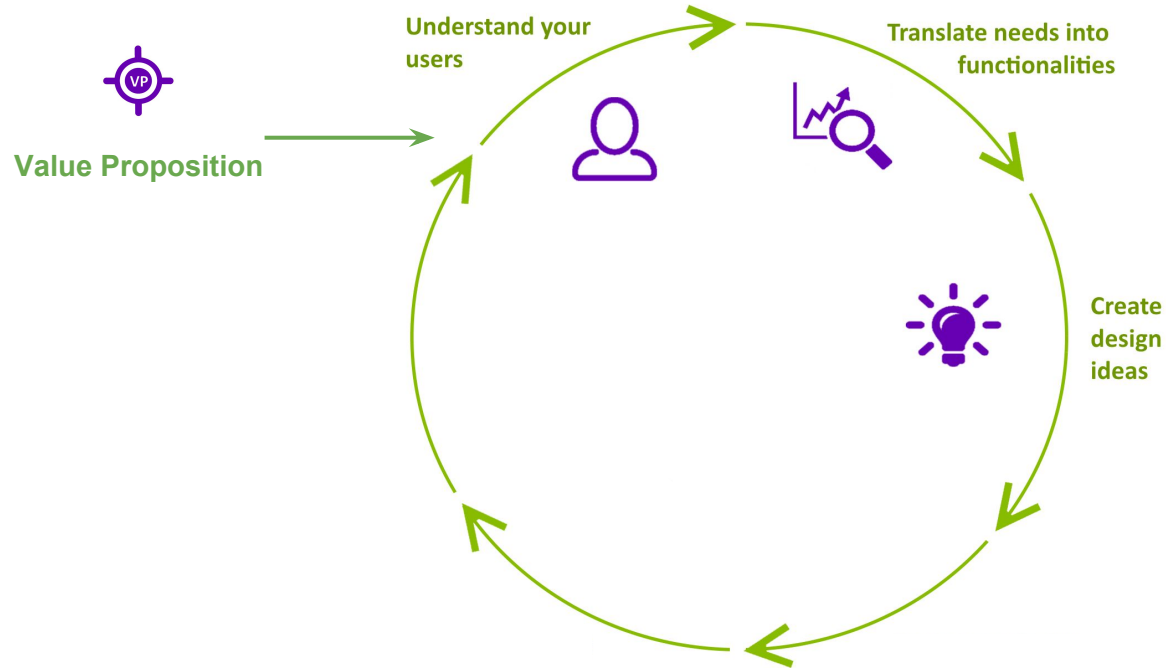**Feedback** - conveys effects of user's actions

Discoverability - whether it's possible to figure out how to use an object by interacting with it

Mapping - indication of the relationship between objects

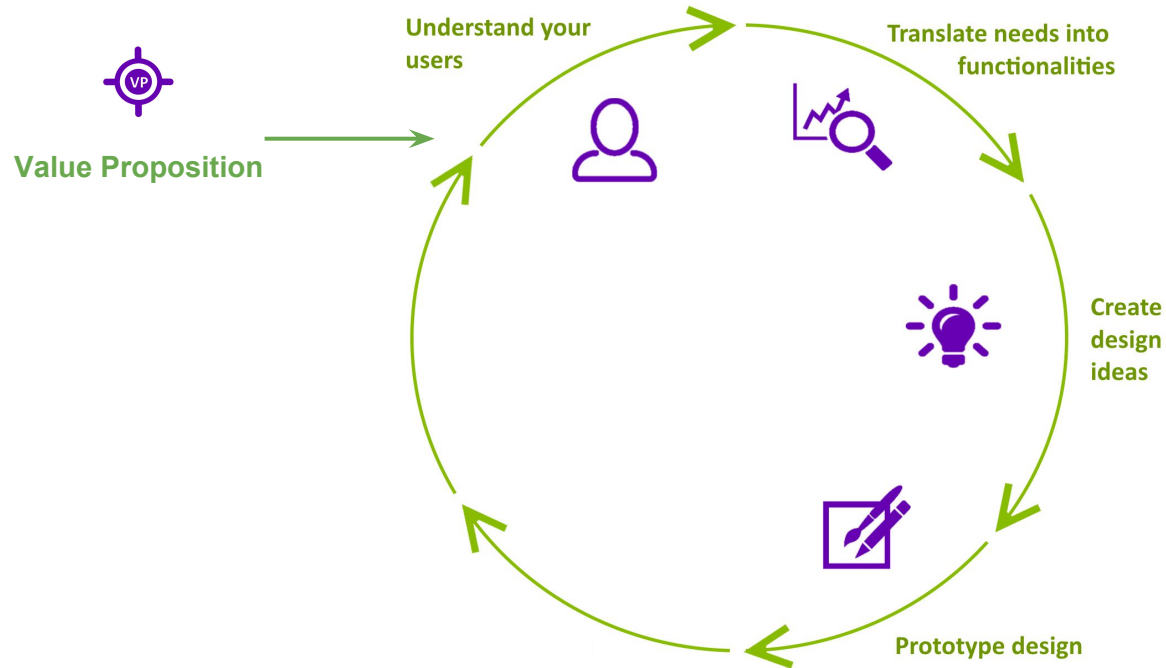**Conceptual Model** - user's understanding of how the system works

Course Review

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Prototype design

Create Design Ideas → **Prototype Design**

Information Architecture - structural design of shared information environments

Richard Saul Wurman

Users flow through your product

Catalog user's information

Presentation of the information

Decision driving function

Create Design Ideas → **Prototype Design**

Knowledge Organisation

Taxonomy

Practice of classification based on <u>hierarchical</u> relationship.

Parent-child hierarchies

Folksonomy

Practice of classification based on <u>non-hierarchical</u> relationship.

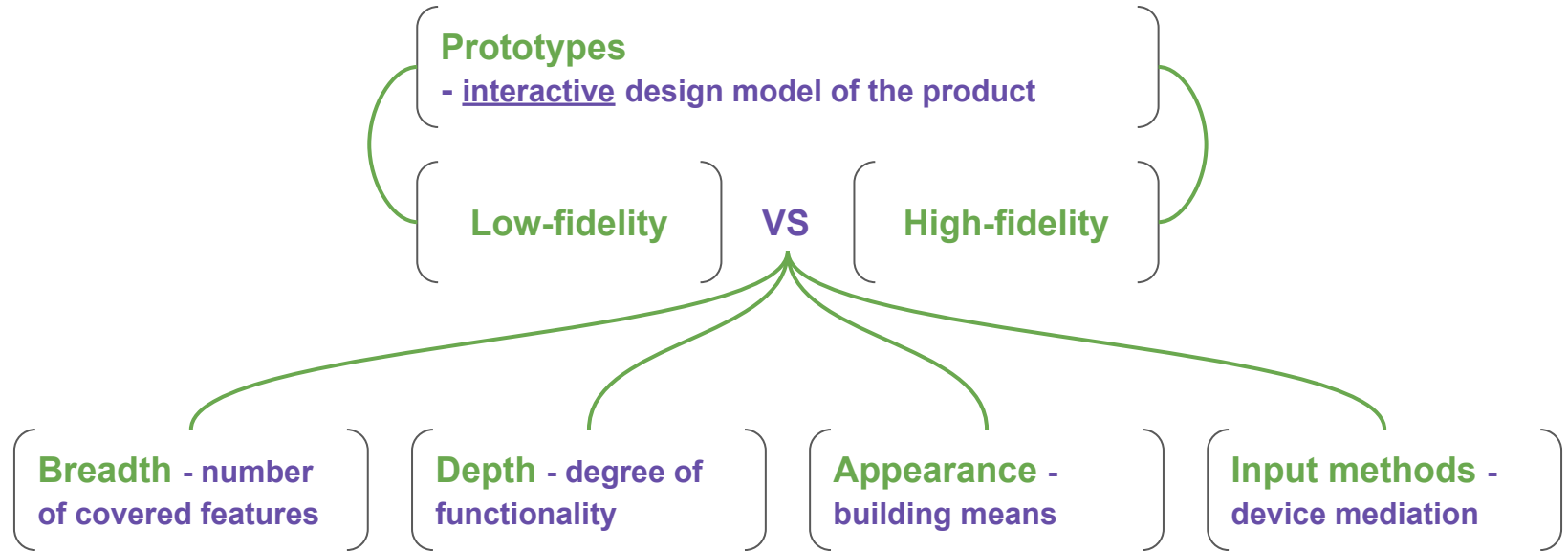Public tags and their frequencies

Domain Analytics Approach

Practice of classification based on <u>sociological - epistemological</u> view.

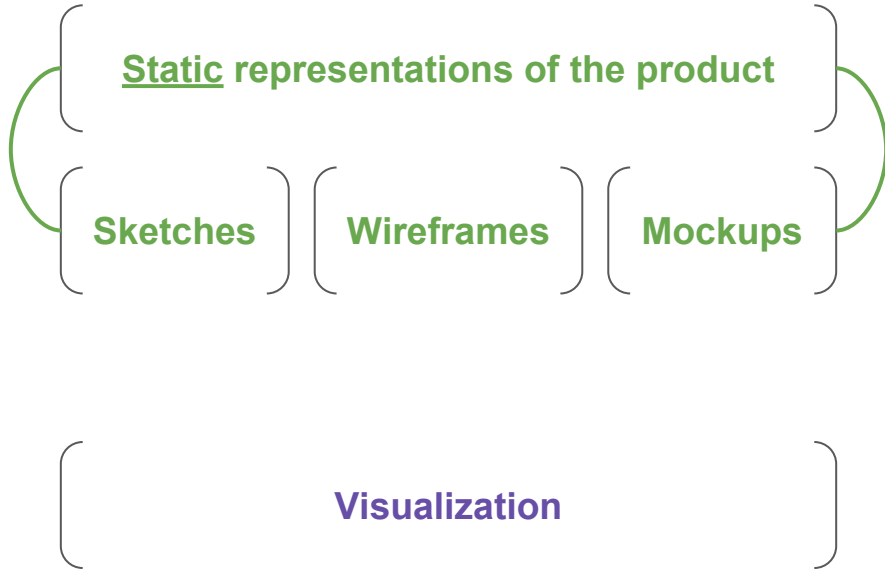Indexing is suited to fulfill a task by specific group

Prototype Design

Prototypes
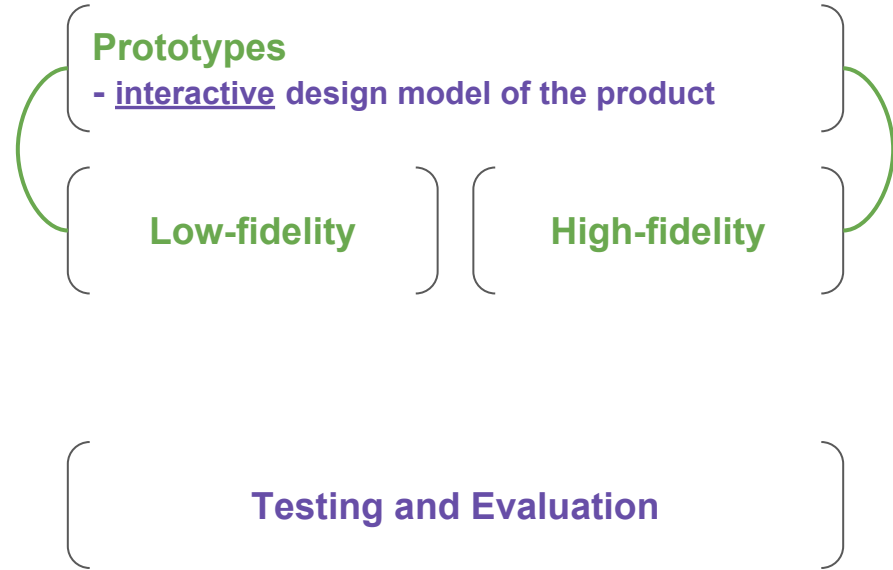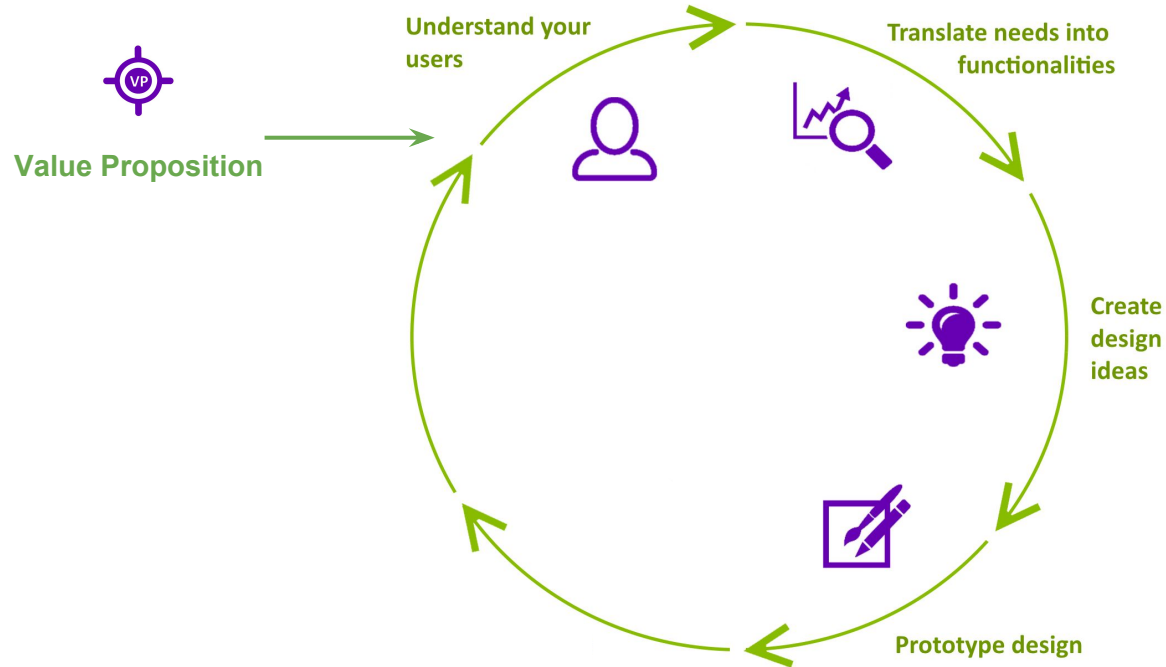- <u>interactive</u> design model of the product

Low-fidelity   **VS**   **High-fidelity**

Breadth - number of covered features

Depth - degree of functionality

Appearance - building means

Input methods - device mediation

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

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Test & Evaluate
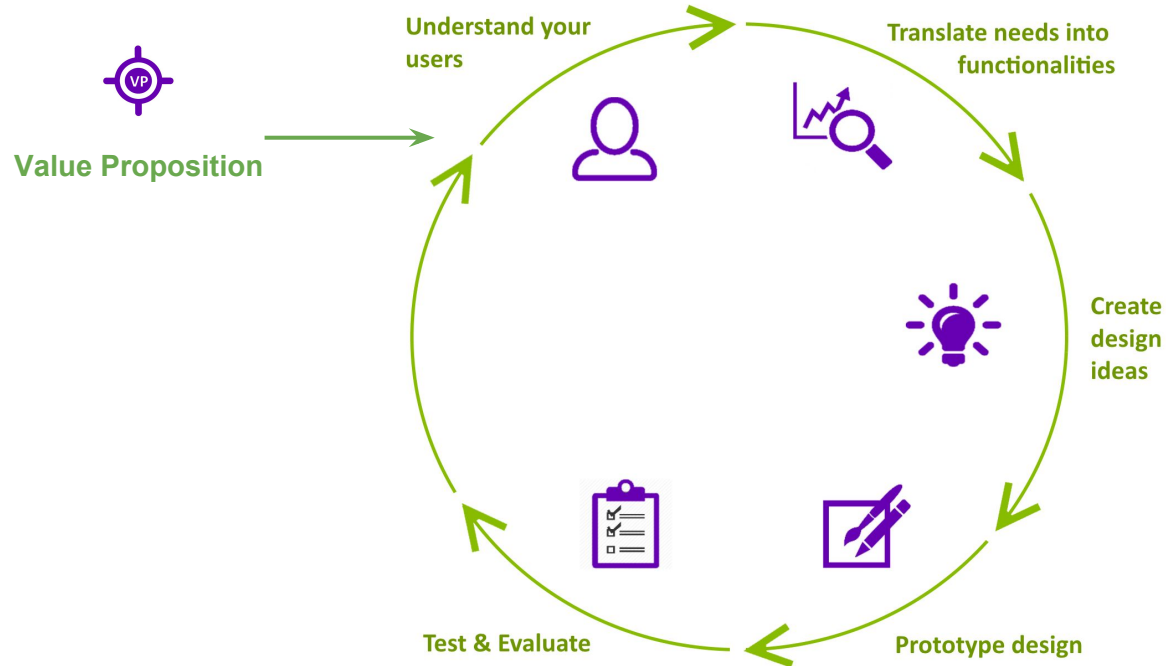
Prototype Design

Paper Prototyping Evaluation

1. Identify testing goals

2. Identify items to test

3. Choose testers

4. Prepare materials

5. Assign team roles

6. Run evaluation

Course Review

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Test & Evaluate
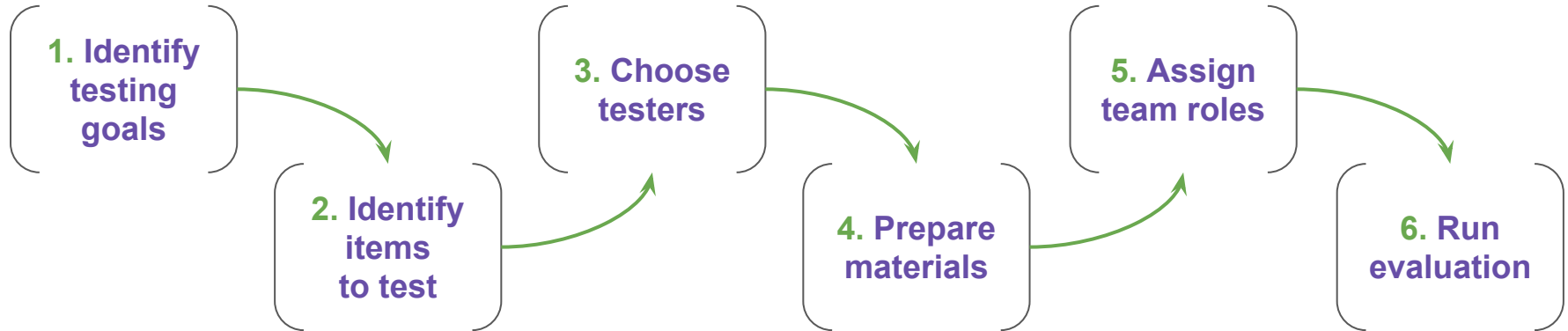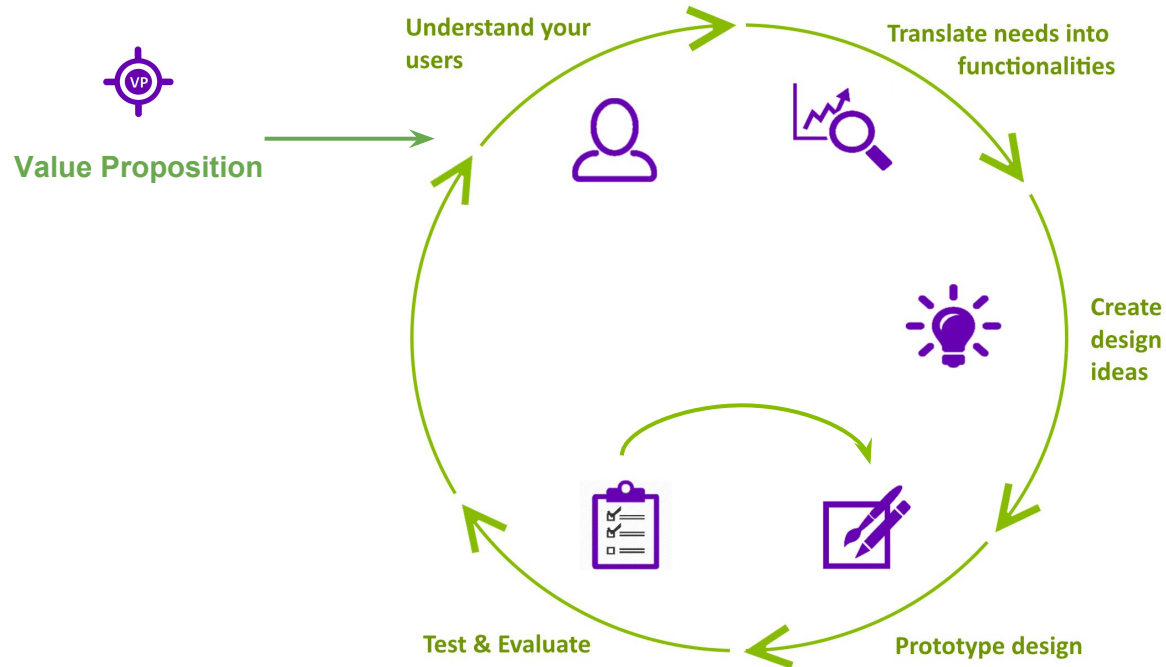
Prototype Design

High Fidelity Prototyping Tools

- Interactive
- Realistic system response
- Content and workflow details
- (Almost) Full fidelities
- Less human errors
- Allows usability testing

Prototype Design

Designing User Interface

Elements & characteristics

Elements composition

Spatial organisation

Information processing

Interaction

Visual Design

"Cognitive" Design

Prototype Design

Designing User Interface

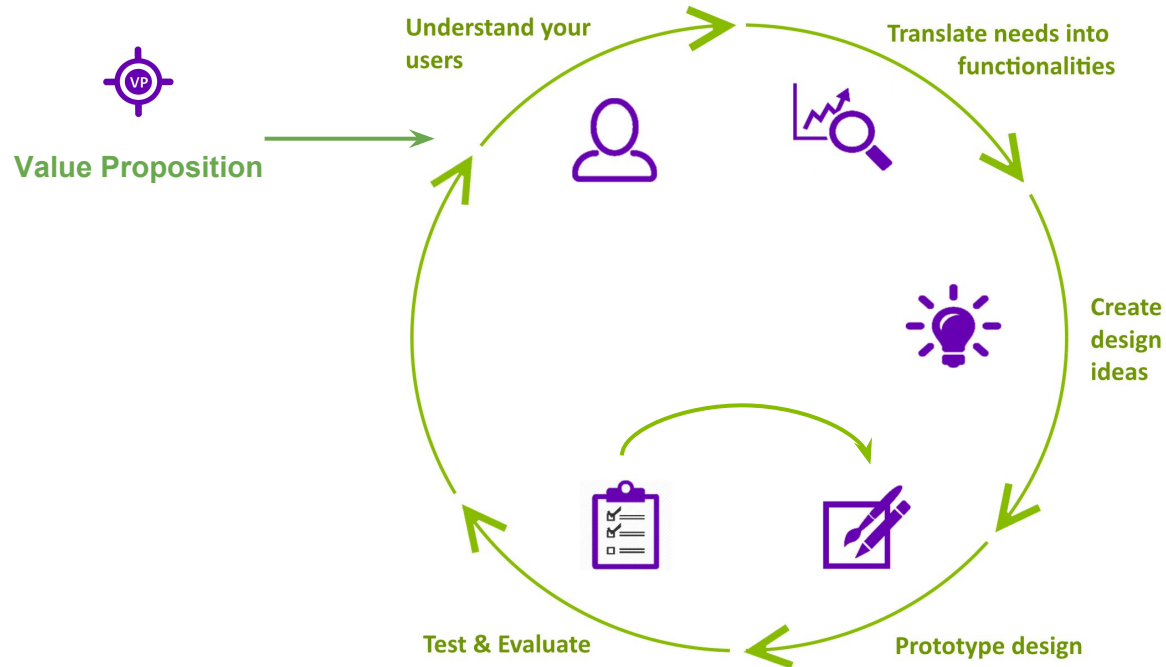| Elements & characteristics	Elements composition	Spatial organisation	Information processing	Interaction
Color Perception	The Von Restorff effect	Rule of Thirds	Dual-coding theory	Manipulation
Shape Perception	Gestalt Principles	Types of vision	Patterns matching	Locomotion
Visceral Reaction Triggers	Fitt's Law	Free space	Social & Emotional info	Conversation

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Prototype design

Test & Evaluate

Prototype Design

High Fidelity Prototype Evaluation

Heuristic Evaluation	Tree Testing	Click Testing
Eye Tracking	A/B Testing	Keystroke Level Modeling
Focus Groups	Walk Through	Five Second Test