



Prototyping

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ac4d

David Kelly | IDEO

“Humans are really interesting. If you show them your idea in a prototype form, very few people will tell you what’s right about it. But everybody will tell you what’s wrong with it.”

Prototyping

The process of creating usable artifacts at a variety of fidelities of completion, in order to answer design questions and communicate design ideas; with users in the context of use.

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Fidelity – The level of detail, completion, or polish that is required to communicate a concept.

Prototyping

The process of creating usable artifacts at a variety of fidelities of completion, in order to answer design questions and communicate design ideas; with users in the context of use.

Or check our design assumptions!

Prototyping

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Prototyping

The process of creating usable artifacts at a variety of fidelities of completion, in order to answer design questions and communicate design ideas; with users in the context of use.

The people that will ultimately be using the final product.

Prototyping

The process of creating usable artifacts at a variety of fidelities of completion, in order to answer design questions and communicate design ideas; with users in the context of use.

The environment and or conditions in which the person will be using the final product.

Prototyping

AESTHETICS



Digital Prototypes

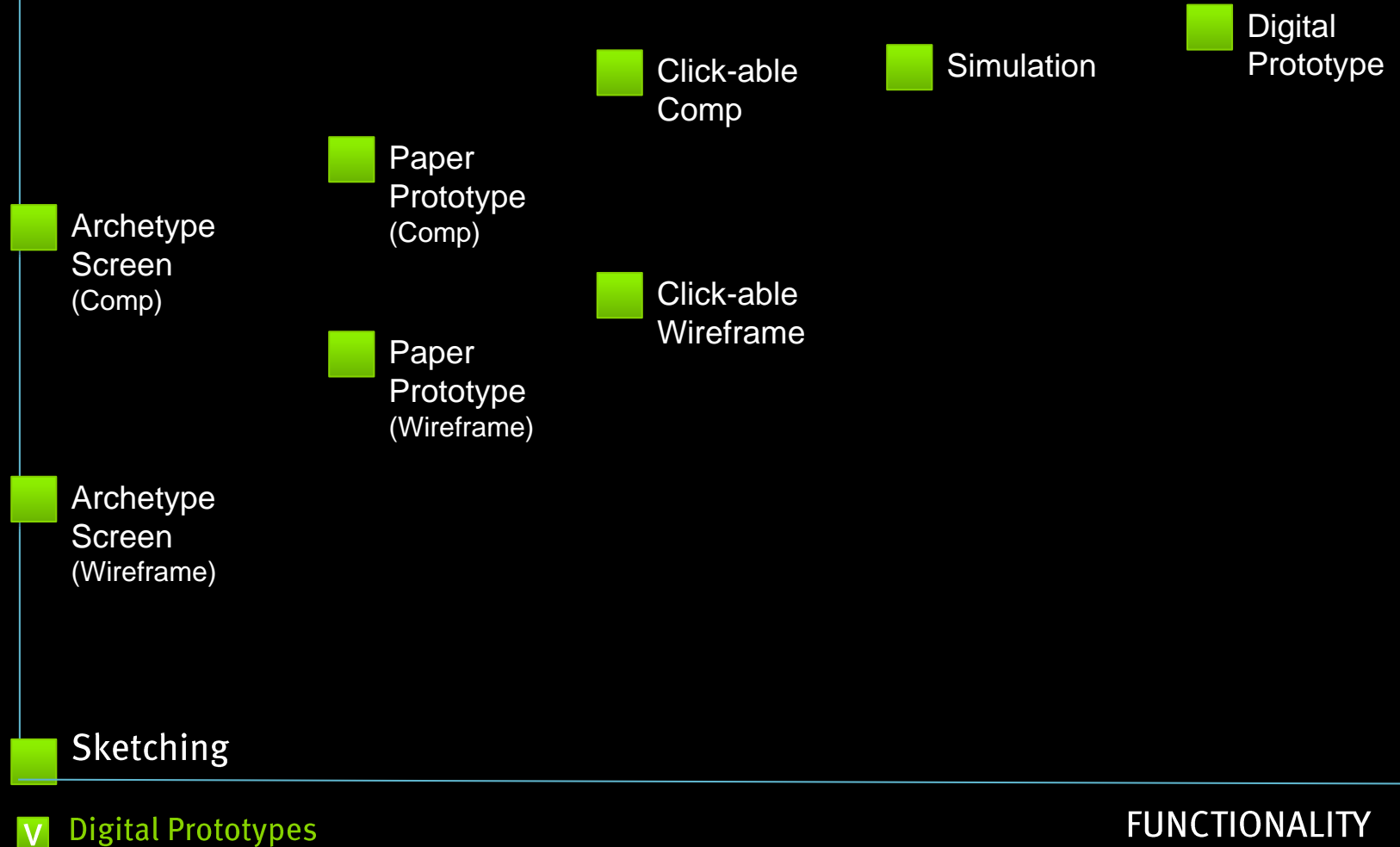


Physical Prototypes

FUNCTIONALITY

Digital Prototyping

AESTHETICS



FUNCTIONALITY

Digital Prototyping

V Sketches

Checkout Flow | BethanyStolle

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1. Place Your Order

Individual Coaching Initial Assessment

price \$100 x qty = total \$100

☐ (avg) ☐ add another package

2. Client Information

Name: _____
Organization: _____
Address: _____
City: _____ State: Zip: _____
Phone: _____ Email: _____
☐ Same as billing address

3. Payment

• credit card ☐ ☐ ☐ ☐ • PayPal
card number: _____
expiration:
security code: _____

4. Total \$100

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1. Place Your Order

Individual Coaching Initial Assessment

price \$100 x qty = total \$100

☐ (avg) ☐ add another package

You are about to place an order for:

Individual Coaching Initial Assessment \$100

Do you want to continue?

4. Total \$100

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Thank You for your order!

(printable receipt)

Now What?

- request appointment

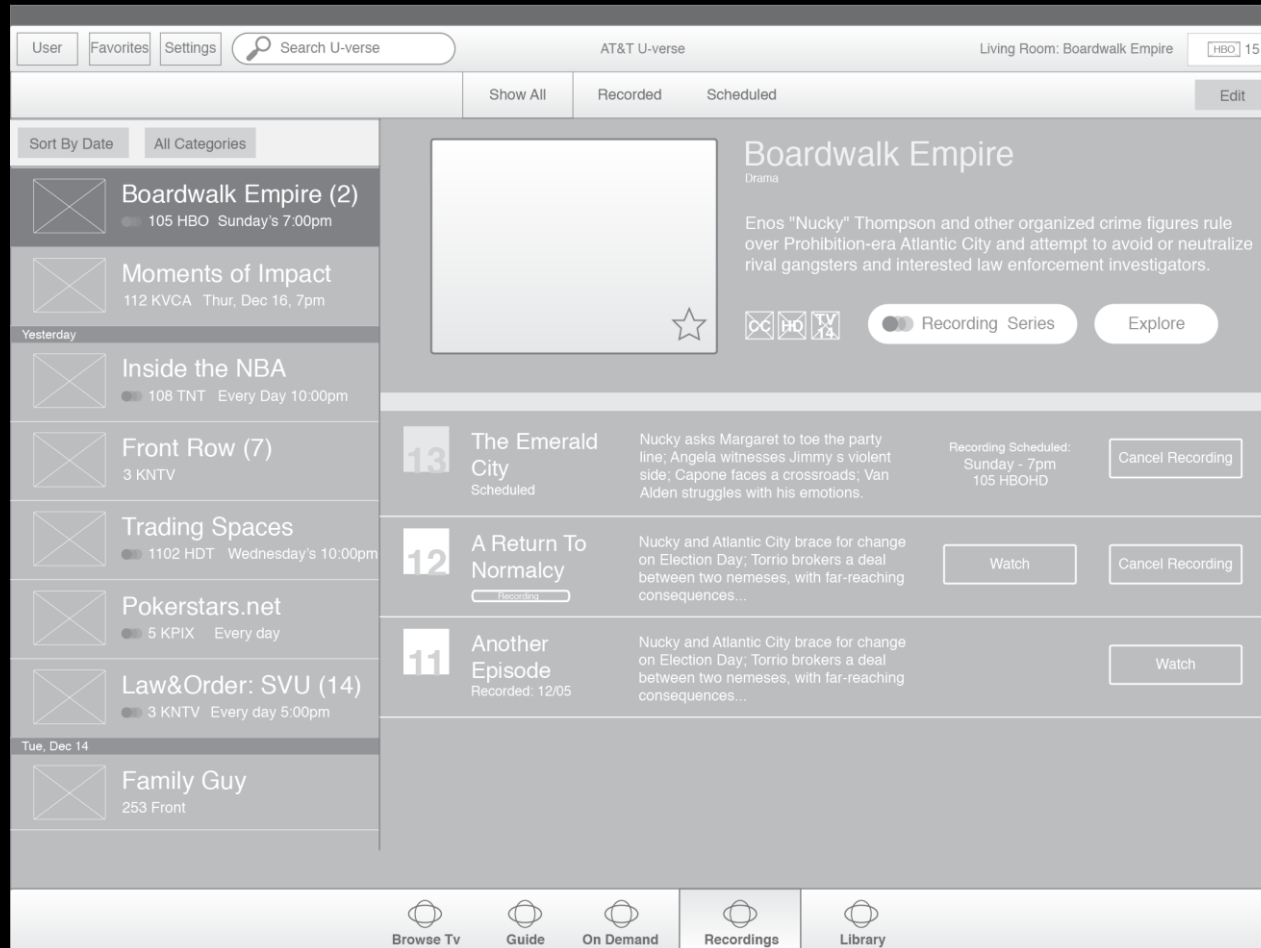
	10/22
10:00a - 11:30a	<input checked="" type="checkbox"/>
2:00p - 3:30p	<input checked="" type="checkbox"/>
3:30p - 5:00p	<input checked="" type="checkbox"/>
7:00p - 8:30p	<input type="checkbox"/>

10/22: 10:00a - 11:30a (removed)
10/22: 3:30p - 5:00p (removed)
- check your email
Bethany will follow up within 48 hours to confirm your appointment. _____
- review the coaching manual

Digital Prototyping

 Wireframe

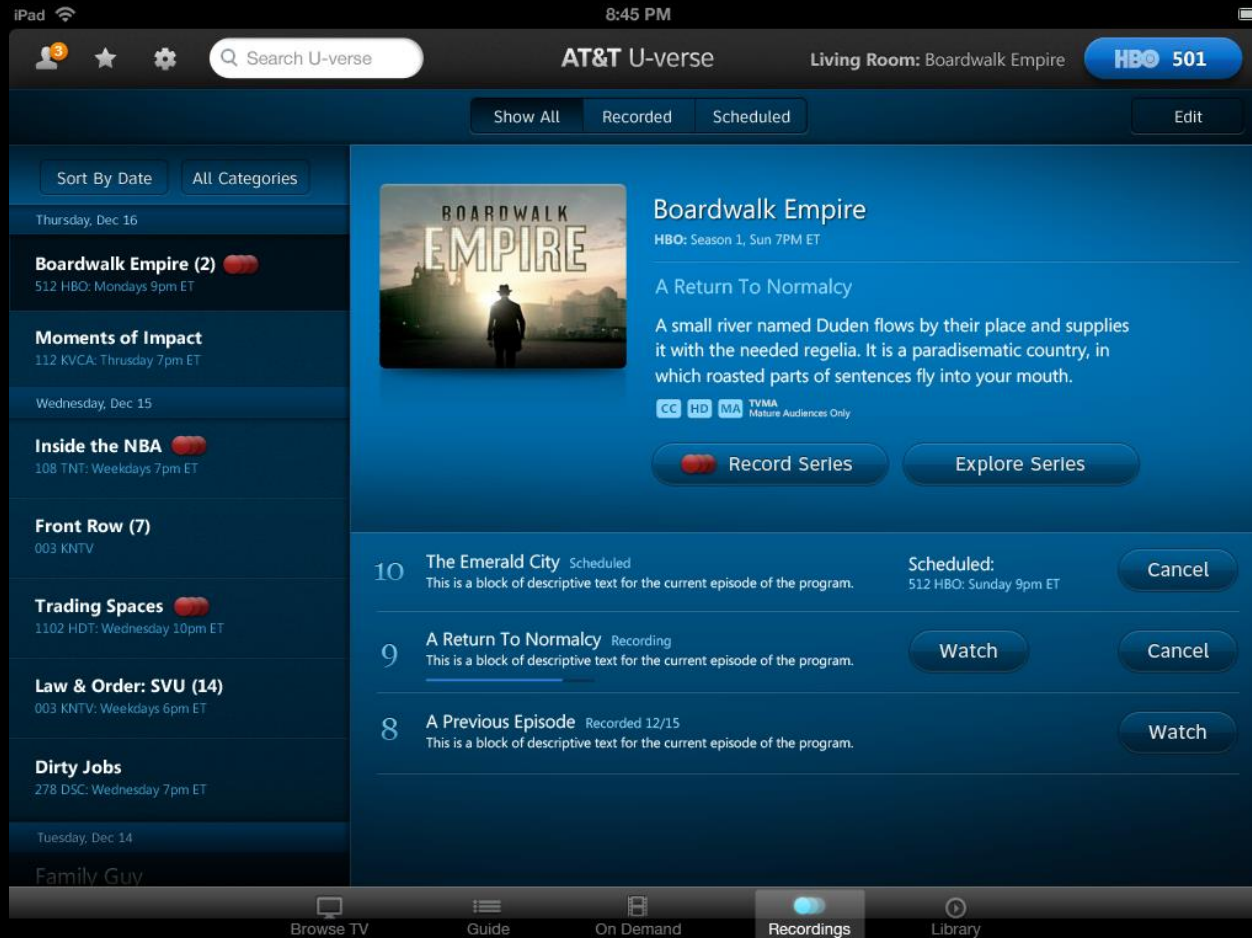
AT&T | U-verse for Tablet



Digital Prototyping

V Comp

AT&T | U-verse for Tablet



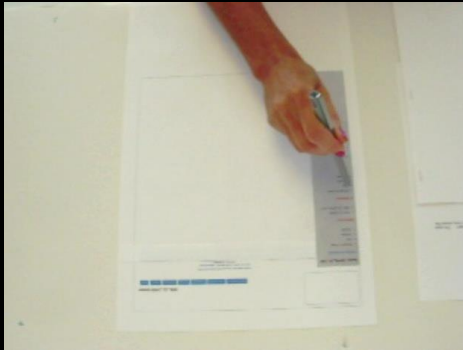
ac4d

Digital Prototyping

V Paper Prototyping

Task: Access the product details of product #1431 and confirm the vendor's material selection.

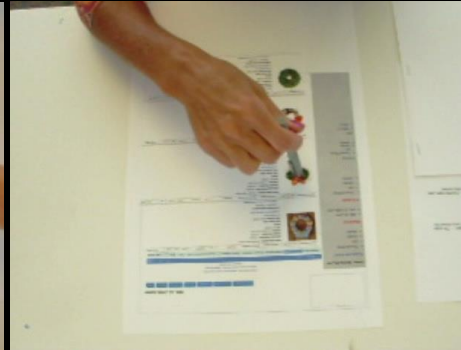
Target | Internal PLM



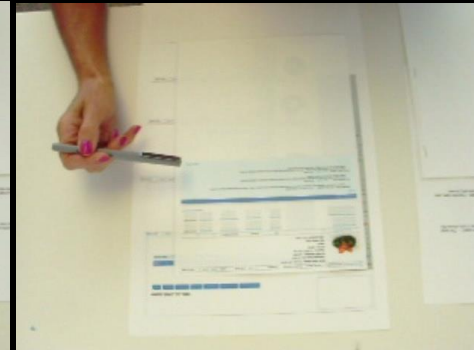
Step 1
User is on the Dept home page
User “clicks” product category



Step 2
Product category is displayed



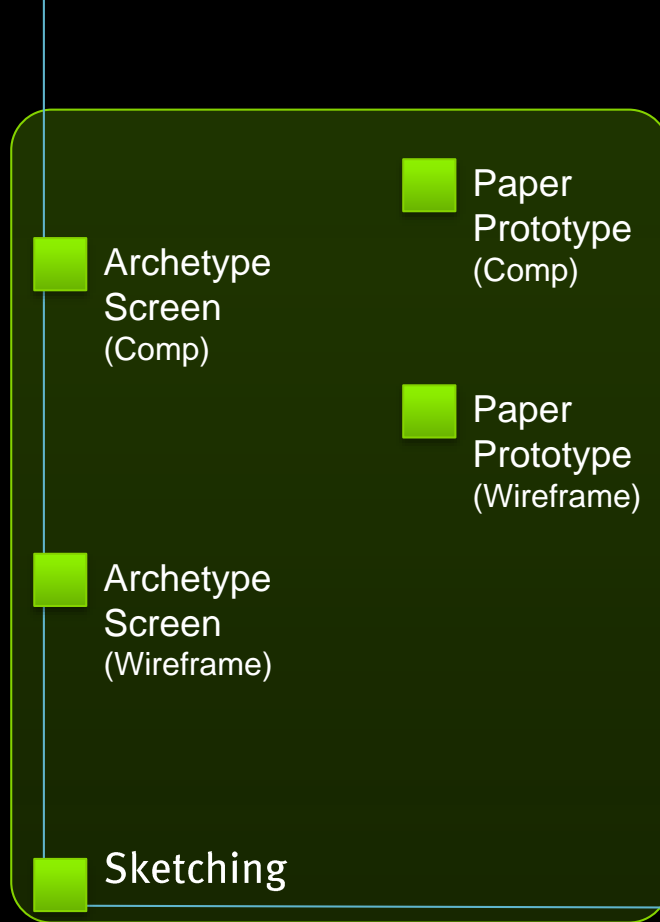
Step 3
User “clicks” a product to see
the product details page



Step 4
The product details page
is displayed. The user
confirms the vendor's
material selection.

Digital Prototyping

AESTHETICS

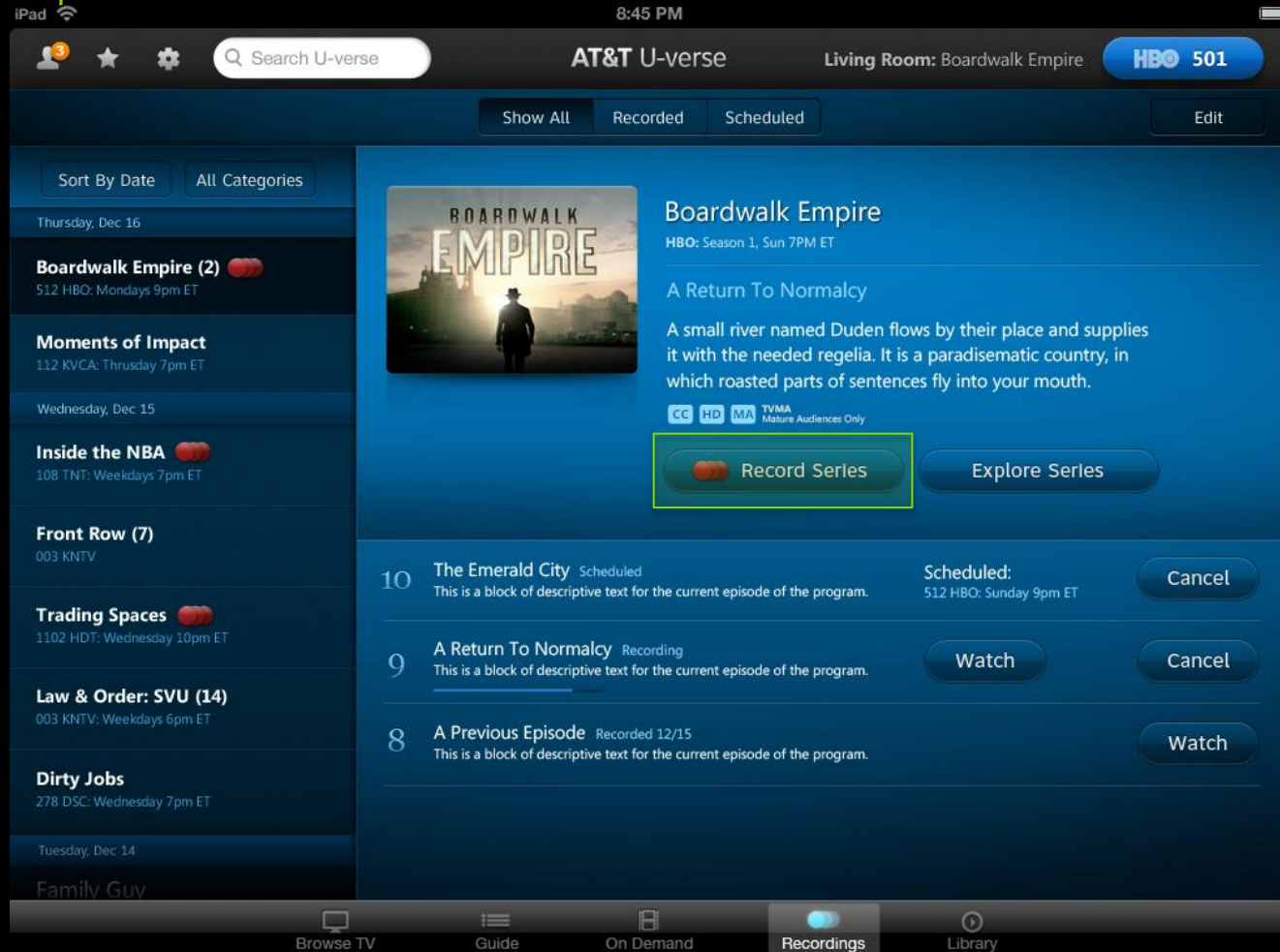


Low Fidelity Prototypes:
Allow for rapid iteration &
“on the fly” customization

FUNCTIONALITY

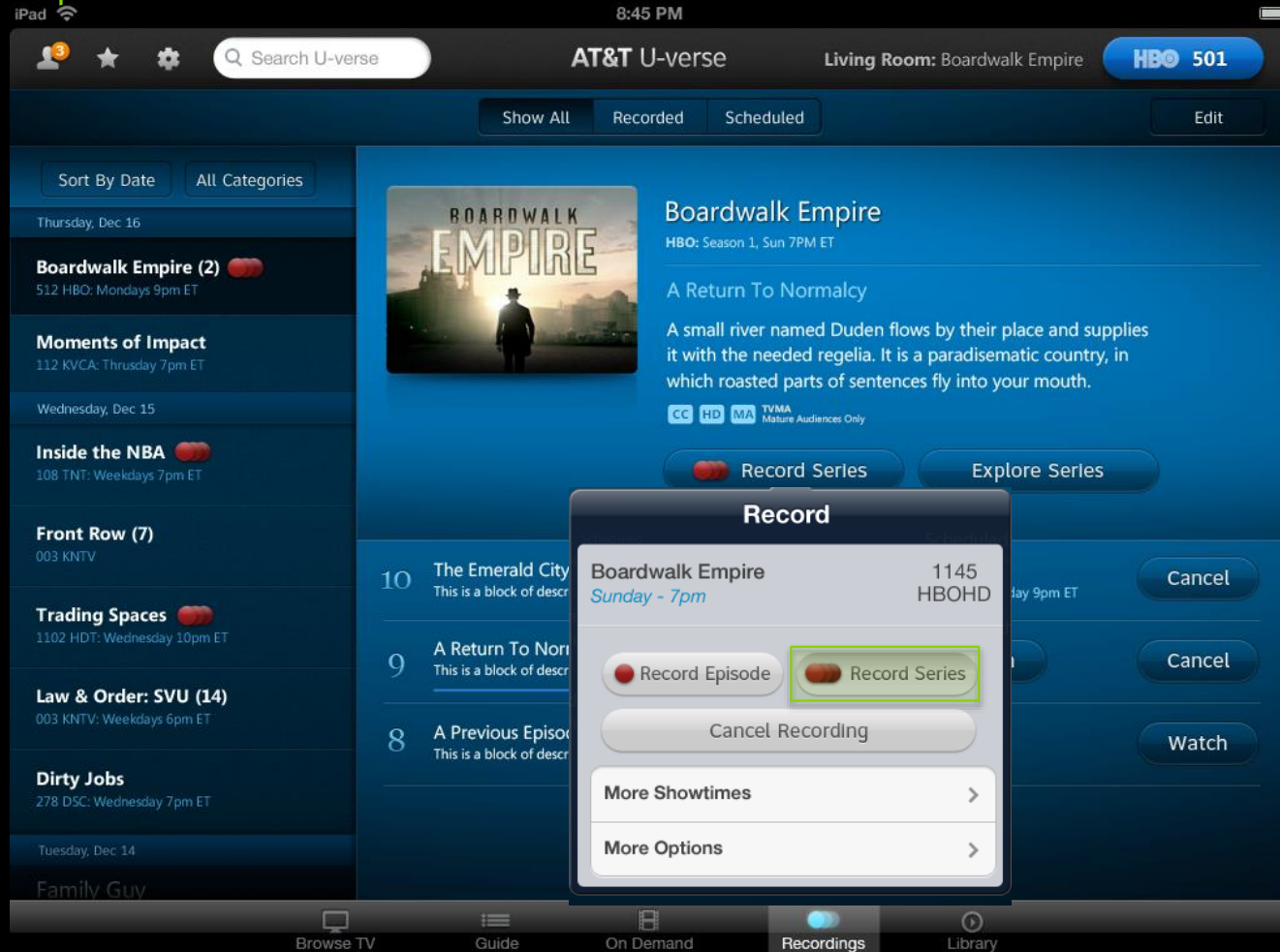
Digital Prototyping

✓ Click-able Comp



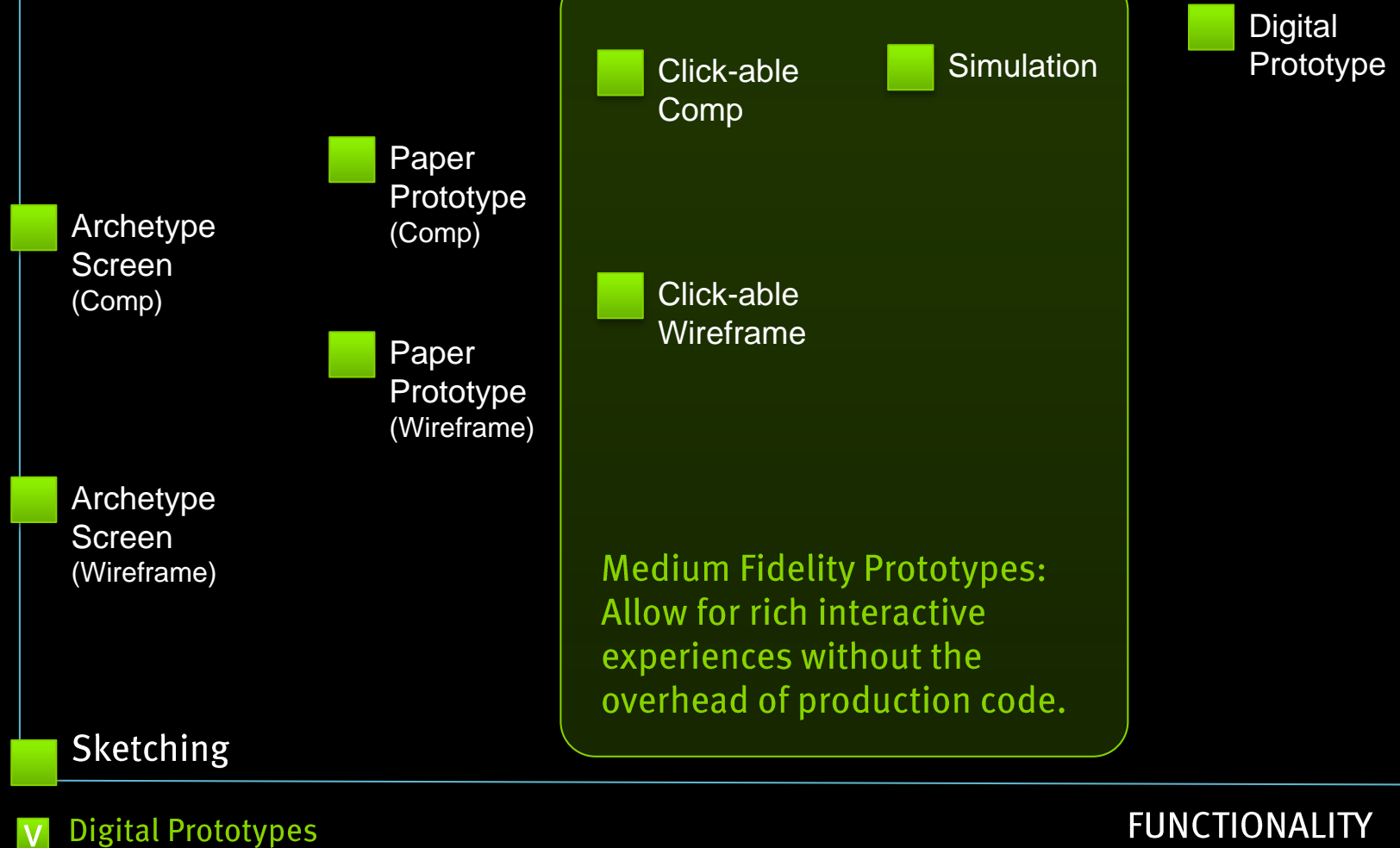
Digital Prototyping

✓ Click-able Comp



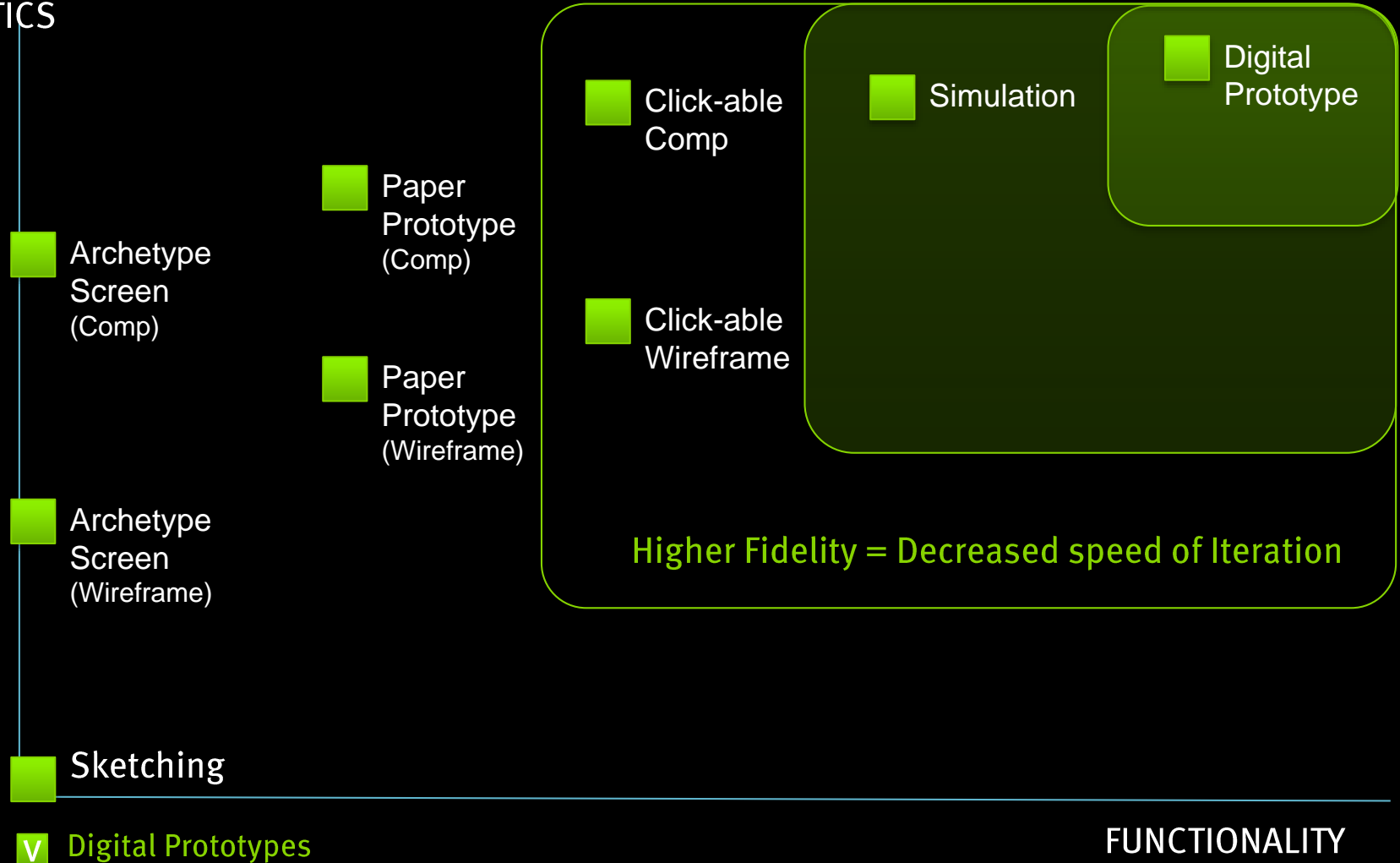
Digital Prototyping

AESTHETICS



Digital Prototyping

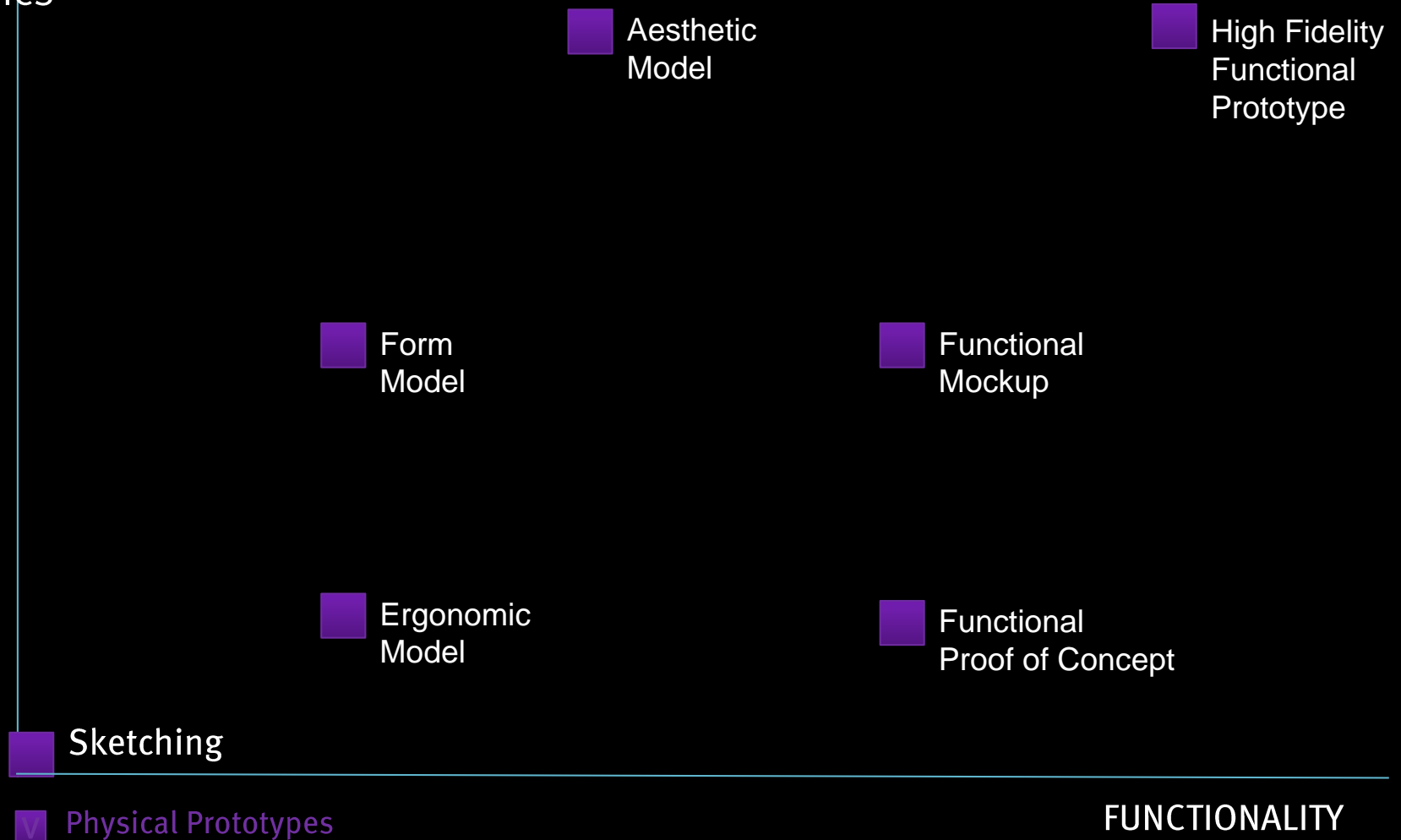
AESTHETICS



FUNCTIONALITY

Physical Prototyping

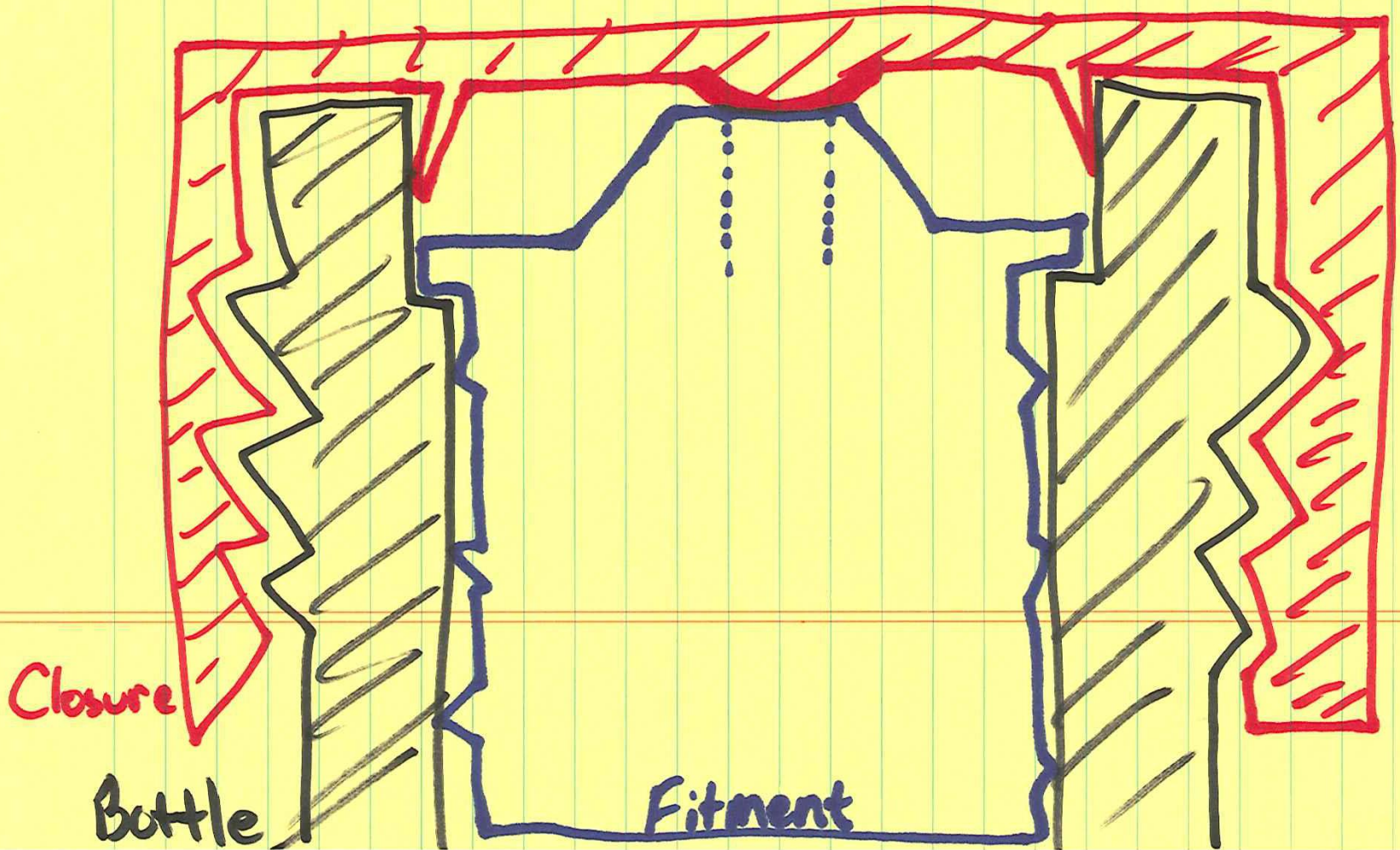
AESTHETICS



FUNCTIONALITY

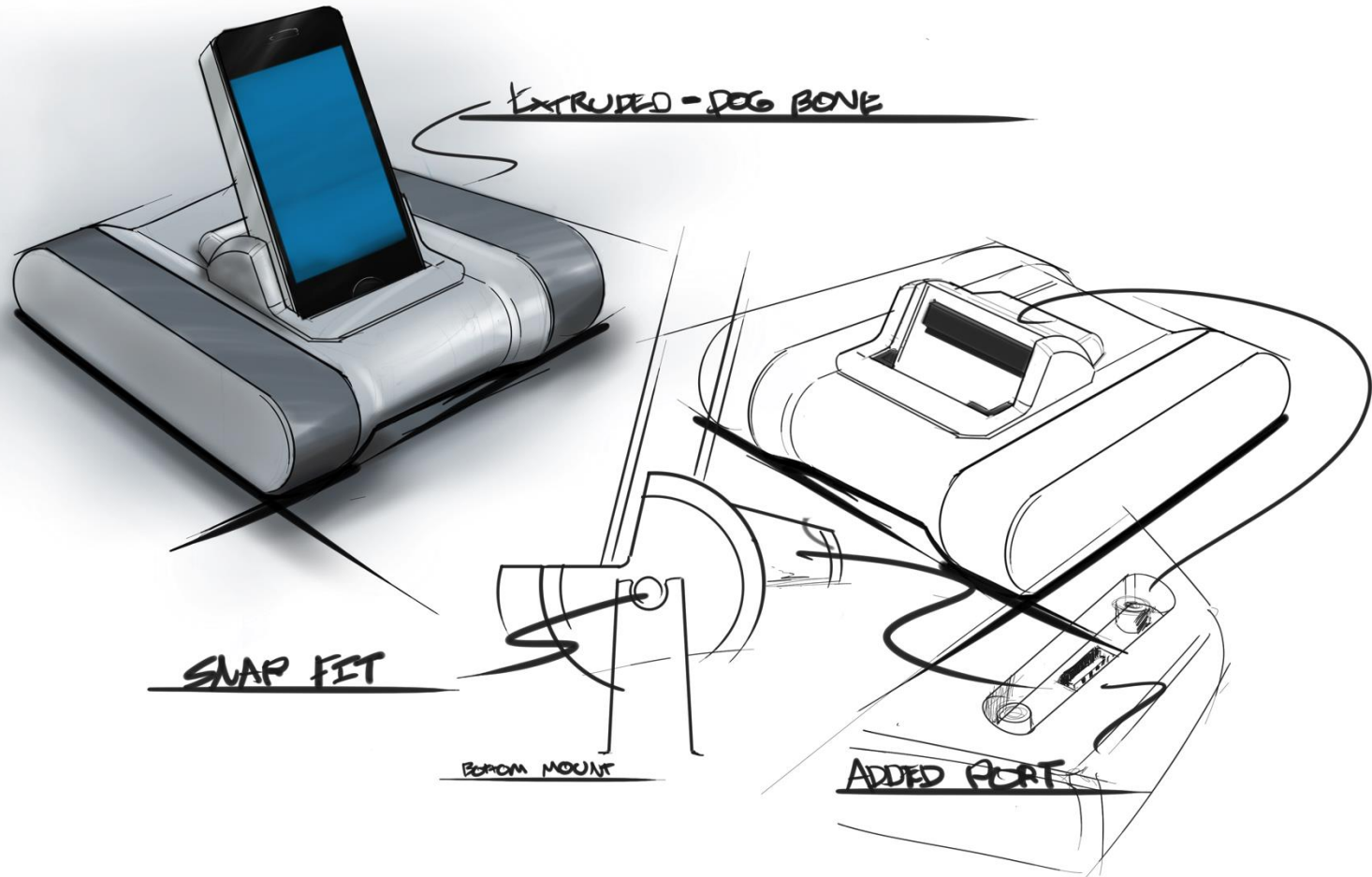
Physical Prototypes

Engineering Sketches



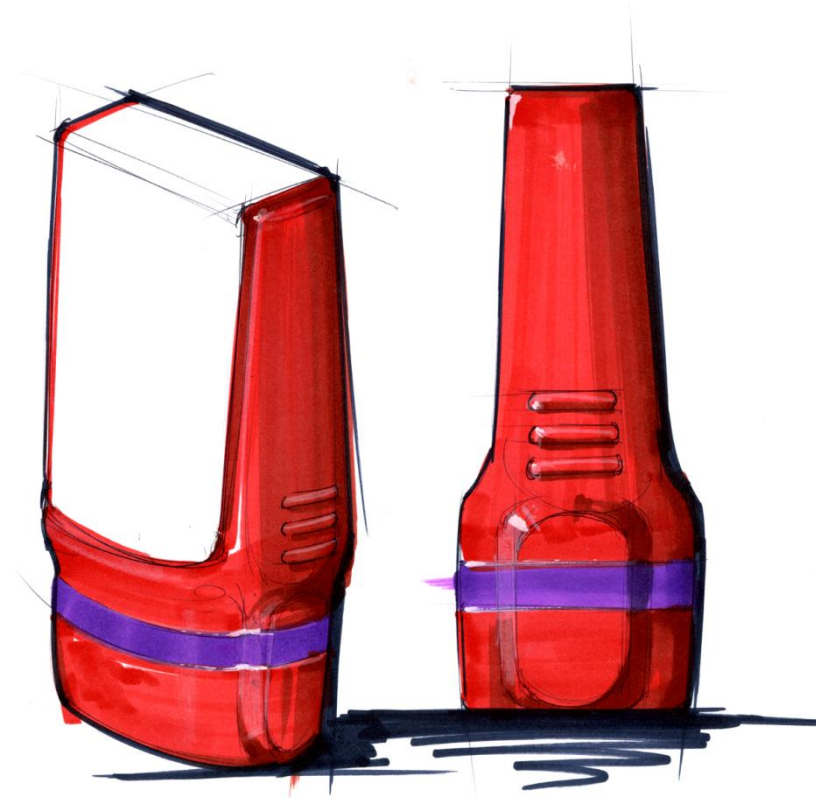
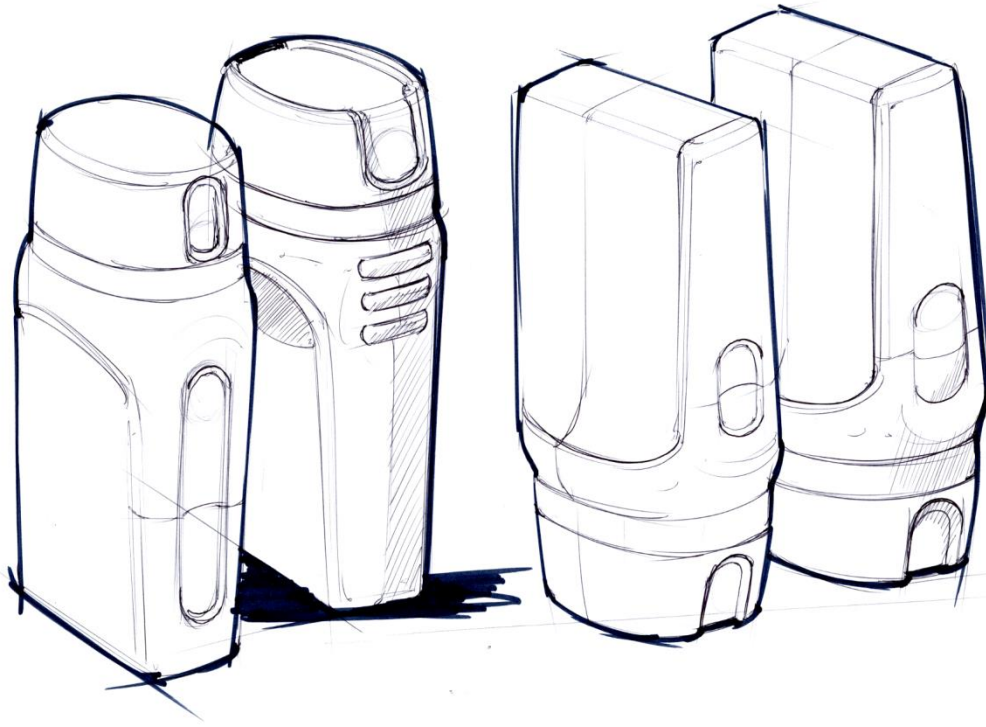
Physical Prototypes

Function Sketches



Physical Prototyping

Form Sketches



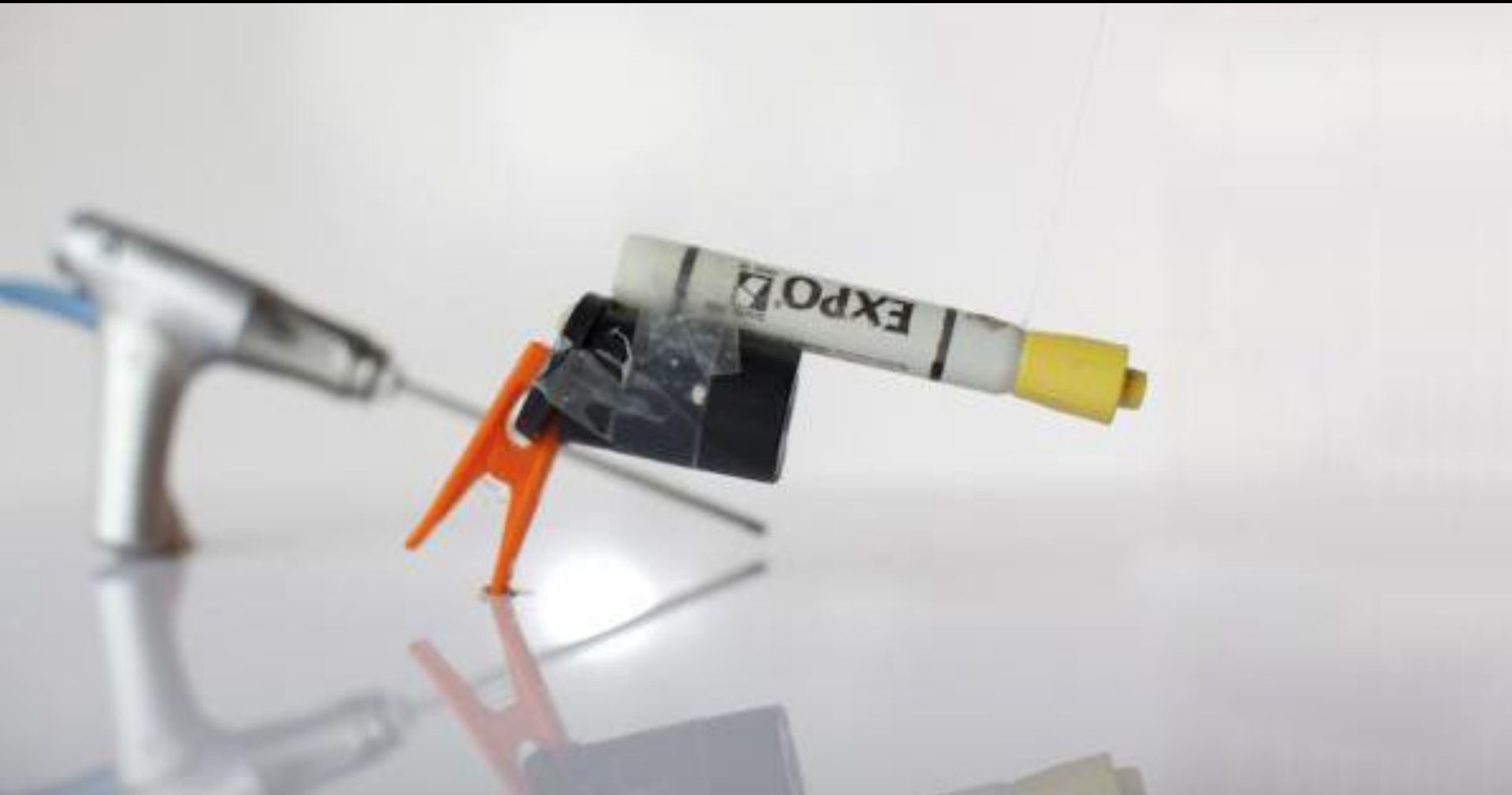
Physical Prototypes

✓ Form / Ergonomic Model



Physical Prototypes

✓ Ergonomic Model



Physical Prototypes

Form Model



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Foam core & Masking Tape | SCAD

Physical Prototyping

AESTHETICS

Low Fidelity Prototypes:
Allow for rapid iteration
& “on the fly” customization

■ Aesthetic Model

■ High Fidelity Functional Prototype

■ Form Model

■ Functional Mockup

■ Ergonomic Model

■ Functional Proof of Concept

■ Sketching

■ Physical Prototypes

FUNCTIONALITY

Physical Prototypes

✓ Aesthetic Model



Physical Prototyping

AESTHETICS

Medium Fidelity Prototypes:
Allow for rich interactive
experiences without the
overhead of manufacturing

Aesthetic
Model

High Fidelity
Functional
Prototype

Form
Model

Functional
Mockup

Ergonomic
Model

Functional
Proof of Concept

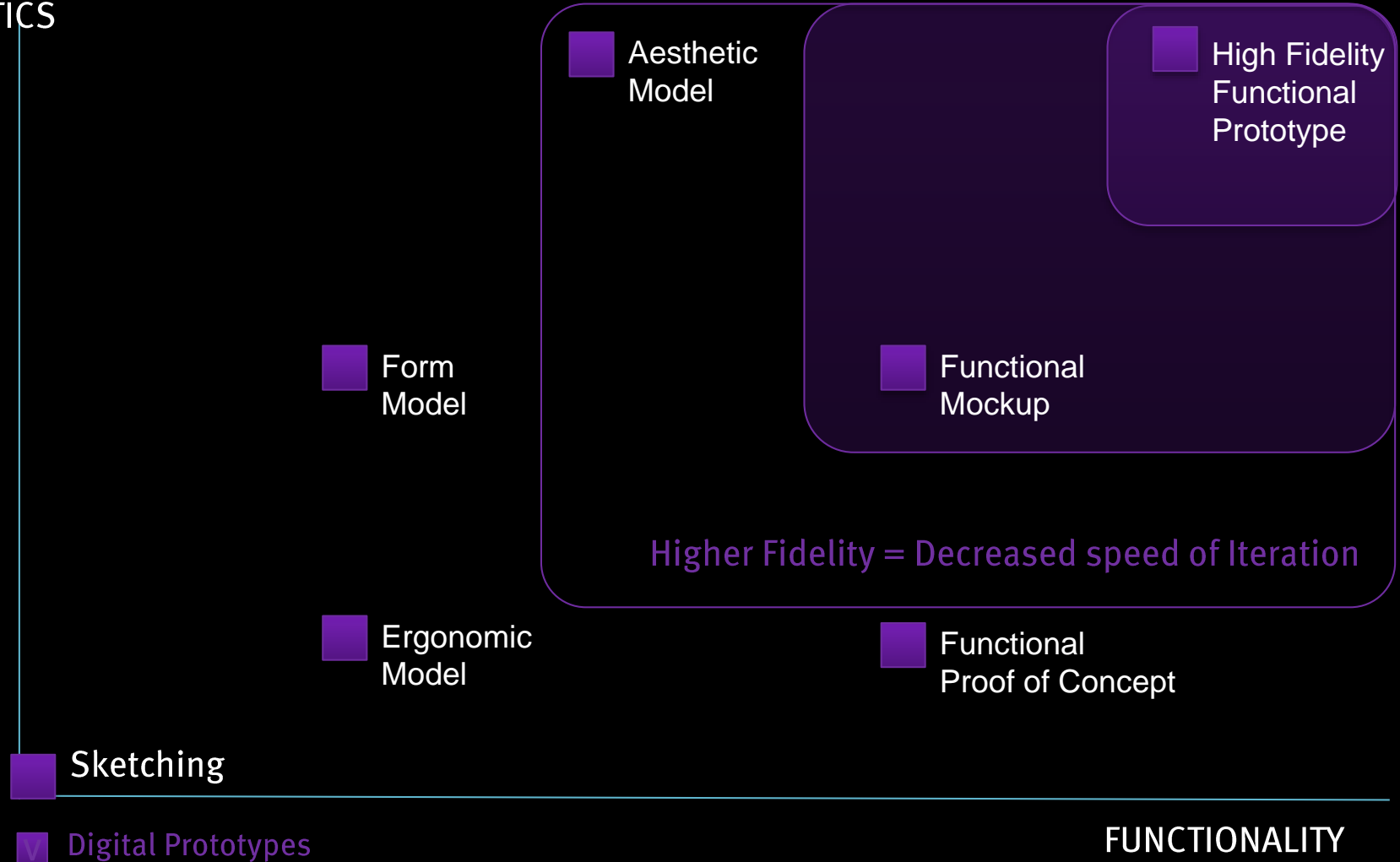
Sketching

Physical Prototypes

FUNCTIONALITY

Physical Prototyping

AESTHETICS



FUNCTIONALITY

What is the appropriate level of fidelity?

The level of fidelity that allows you to test what's important while maximizing the number of possible iterations.

With most prototypes, the level of fidelity can be relatively low. People are naturally good at using their imagination to fill in the details.

Start with Low Fidelity Prototypes

These prototypes are extremely useful as they can be made quickly, changed without repercussions, and often elicit better feedback (users are not worried about hurting the designers' feelings).

Creating Physical Prototypes

1. Who you are solving a problem for?

- Who is the primary user of the product, system or service?
- Does this person have any physical or cognitive disabilities?
- What is the context of use for the product (where is the user when they are using this product? Does the use only happen in certain circumstances?)
- Is there another primary, or secondary actor?

For Example:

Drone Pilot

Might need to accomplish familiar tasks while using a new set of controls.
Has a limited viewing screen for all sight lines and forms of system feedback.

Elderly Person

Might not be able to see font under 16pt
Or do any task requiring manual dexterity

Creating Physical Prototypes

2. What goal is the user trying to accomplish?

Use cases are a great place to start when outlining the user's goal. Write a statement that captures the user's goal, the context of use, and any associated constraints or considerations.

For Example:

Drone Pilot

Needs to be able to locate targets through the camera, maintain visual contact with targets while engaging, and keep control of the aircraft.

Elderly Person

Needs to locate their medication within a shared box of medication, confirm it's the right one, and then take the pill – all without getting their glasses.

Creating Physical Prototypes

3. Loosely sketch a variety of forms, control surfaces, etc. that would allow the user to accomplish their goal. Try to come up with 2 – 3 different versions of the same thing, such that performing the task with each version will be noticeably different.

Start with overarching concepts – like form, visual differentiator, or control placement – and then add a few details. If your goal requires a sequence of actions, try to sketch these in as limited sequence as possible. Refer to your storyboards for the appropriate sequence.

Creating Physical Prototypes

4. Using low fidelity materials, create a prototype of each of your sketches that will allow users to accomplish the task. Note: you may also need to construct part of the “context of use” out of these materials as well.
 - Start with creating primary shapes with common materials – Cardboard, foam core & hot glue.
 - For form studies, use pink insulation foam from home depot (spray adhesive can be used to hold layers together. Use a rasp and sand paper to carve the form).
 - For screens / interfaces, use paper print outs – Multiple print outs can be used if the user needs to interact with the system.

Creating Physical Prototypes

4. Using low fidelity materials, create a prototype of each of your sketches that will allow users to accomplish the task. Note: you may also need to construct part of the “context of use” out of these materials as well.

For Example:

Drone Pilot

Needs to be able to locate targets through the camera, maintain visual contact with targets while engaging, and keep control of the aircraft.

Build:

- Some form of cockpit – with Velcro stickers (allows user to move controls around as needed)
- Primary controls – Cardboard tubes?
- A panel with the appropriate secondary controls
- A print out of the screen(s) that they might see as they complete the task

Elderly Person

Needs to locate their “Every 2 hour” medication within a shared box of medication, confirm it’s the right Rx, and then take the pill – all without getting their glasses.

Build

- 2-3 foam shapes that test the best shape for gripping – use a rasp and pink foam
- 2 – 3 Rx Labels for each foam shape to test the placement of Prescription information - with varying size fonts
- Hick’s law*

Hicks' law

With every additional choice, the time it will take for one to make a selection increases.

When prototyping products, systems, and services, Less = More. Try to prototype the variables that need the most attention or are vital to the user achieving their goal.

Creating Physical Prototypes

5. Test your prototypes with 2 or 3 users in the context of use (or as close to it as possible):
 - Ask the user to imagine that they are in the appropriate context (in the bathroom taking medication, or in the cockpit of an airplane).
 - Tell the user they are going to be completing a familiar task with your prototype – tell them the task.
 - Provide the prototype, and the task on a piece of paper, and ask them to walk you through the act of performing it.

Creating Physical Prototypes

6. While Testing:

- RECORD EVERYTHING – with more than one recording device (video or audio, and camera)
- Have one person dedicated to taking notes and one person dedicated to taking photos or video.
- Ask the user to talk as much as possible while performing the task

After Testing

Review your notes, video, and audio – capture each point of failure, for each user, on a post-it.

Failure: If they expressed surprise, made a design suggestion, or anything else that prevented them from completing the task).

User 1



User 2

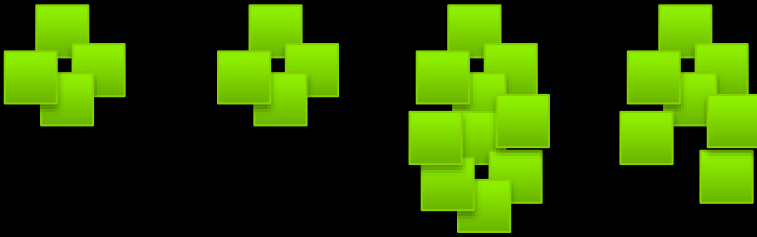


User 3



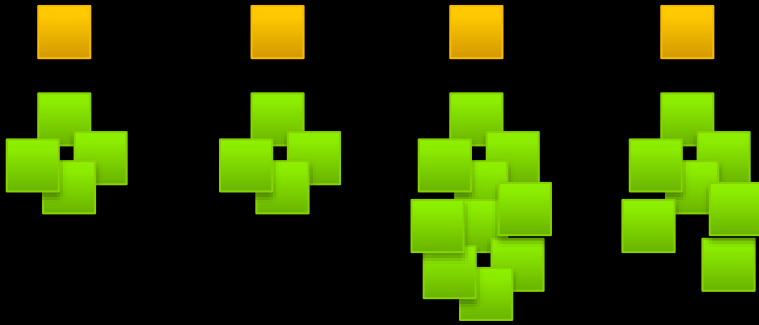
After Testing

Organize these post-its into groups or themes, where themes represent a set of failures that have something in common.



After Testing

Using a different color post-it, label the theme for each group.



After Testing

Refine your designs and prototypes so that they “solve” the problem. Repeat the process until they actually do.

ac4d

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Download our free book,
Wicked Problems: Problems Worth Solving,
at <http://www.wickedproblems.com>