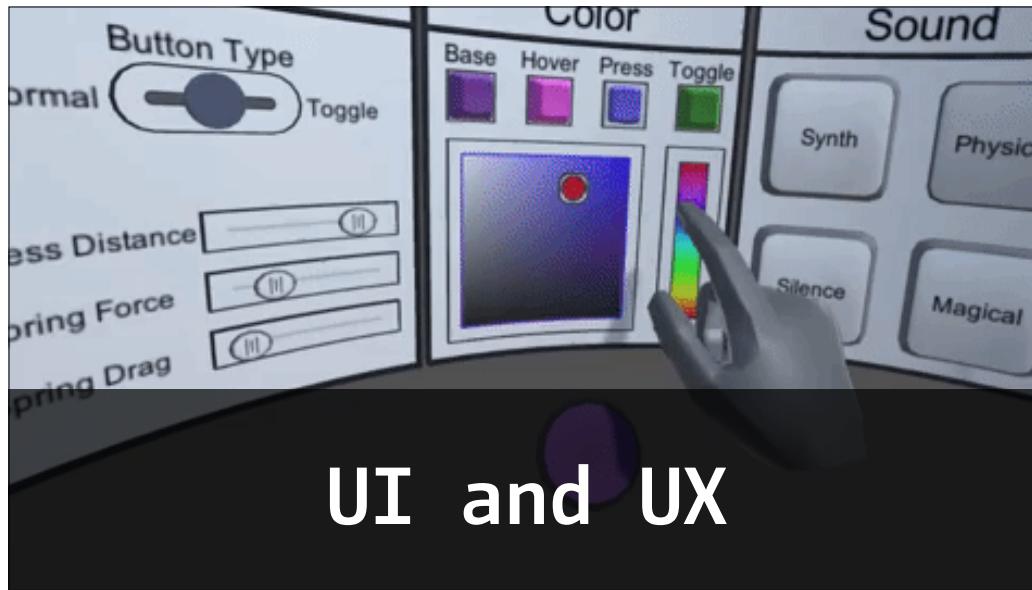


**TECH 421 - Future of Digital Media**  
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# UI and UX

## User Interfaces and User Experience

UX is the design of *how* the user interacts with your program and UI is the *visual manifestation* of the design



Why does this matter?

People need to be able to approach something without any sort of prior knowledge and context and **still be able to figure out how to use it.**

Final will (partially) be judged on ability of people to use it without explanation.

# Screens vs Space

Scale is very important  
**Real world units**



# Manipulation

What is the interface?



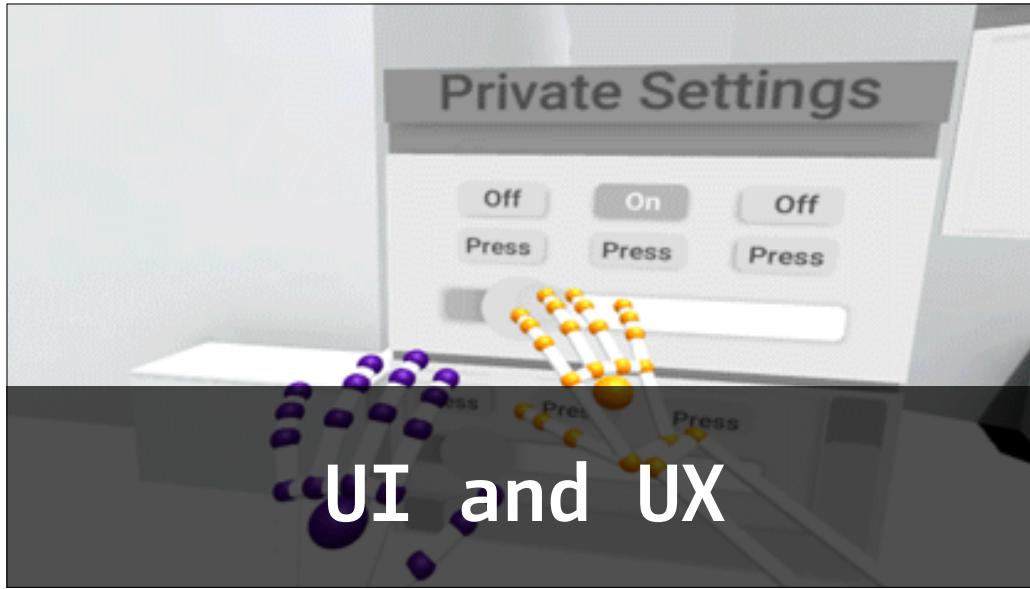
Moving through an environment to discover content - no direct manipulation.

# Expectations

With new types of interface, we must teach users *how* to perform new kinds of interactions.



One approach is Skeuomorphism - creating interfaces that resemble their physical counterparts.



New Concepts



Interface as hardware



## Interface as Software/Design



## Diegetic vs Non-Diegetic

Diegetic elements are part of the fictional world ("part of the story"), as opposed to non-diegetic elements which are stylistic elements of how the narrator tells the story ("part of the storytelling").

In movies, subtitles and voiceover are non diegetic. The music coming out of John Cusack's boom box in *Say Anything* is **diegetic...**



## Diegetic vs Non-Diegetic

... but the music playing in the scenes of Tom Hardy in Dunkirk is **non-diegetic** (We would not hear it if we were in the cockpit with him)...



## Diegetic vs Non-Diegetic

...and the music playing in the scenes of Tom Hardy in Mad Max is a grey area (Some music is in the scene, some is a score in the movie).



Non-Diegetic - HEADS UP DISPLAY (Terminator)

Not attached to or part of anything in the scene - serves as a “narrator” describing things in the scene.



Diegetic - Menu attached to an object you can manipulate in the scene - feels like it some thing **in** the scene.

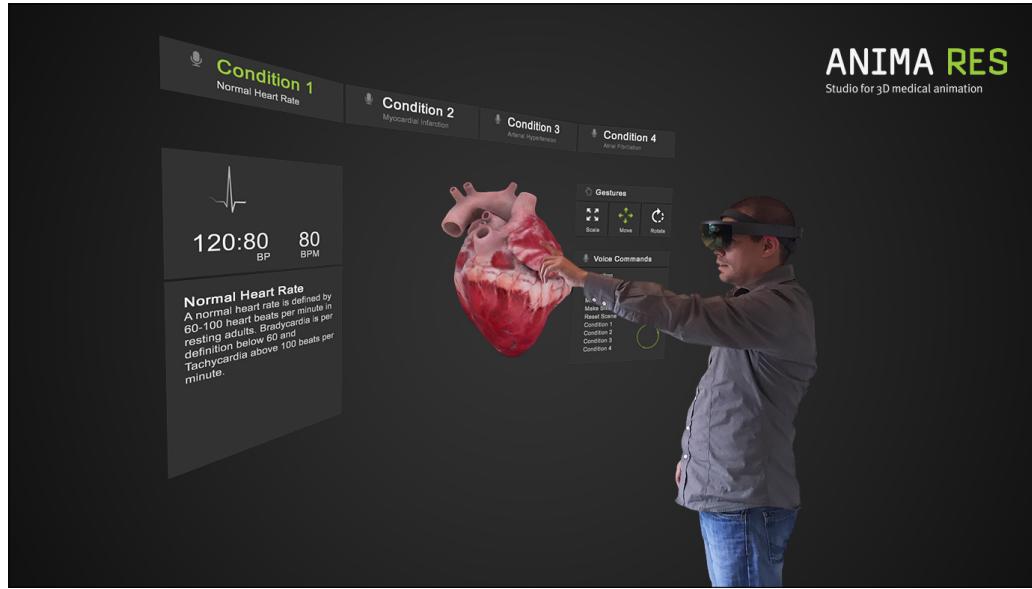


Smarter Objects by Valentin Heun, Shunichi Kasahara, Pattie Maes · MIT Media Lab

Diegetic - Same as VR menu example, but using trackable objects in the real world.

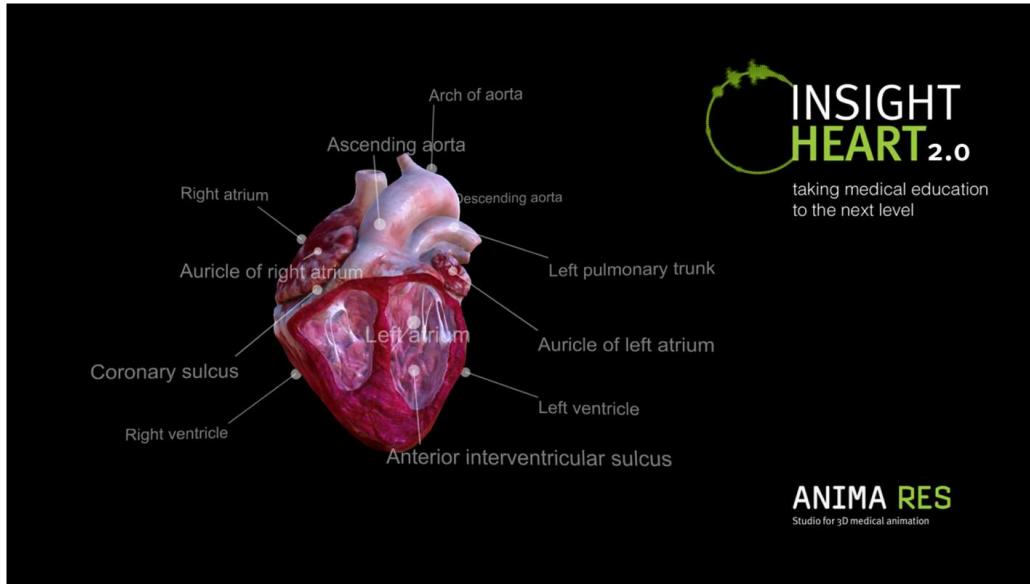


A bridge between screens/space is...



## Diagetic - Panes

Screens brought into space - still can use principles of 2D (pixel-based) design where appropriate.



**INSIGHT  
HEART 2.0**

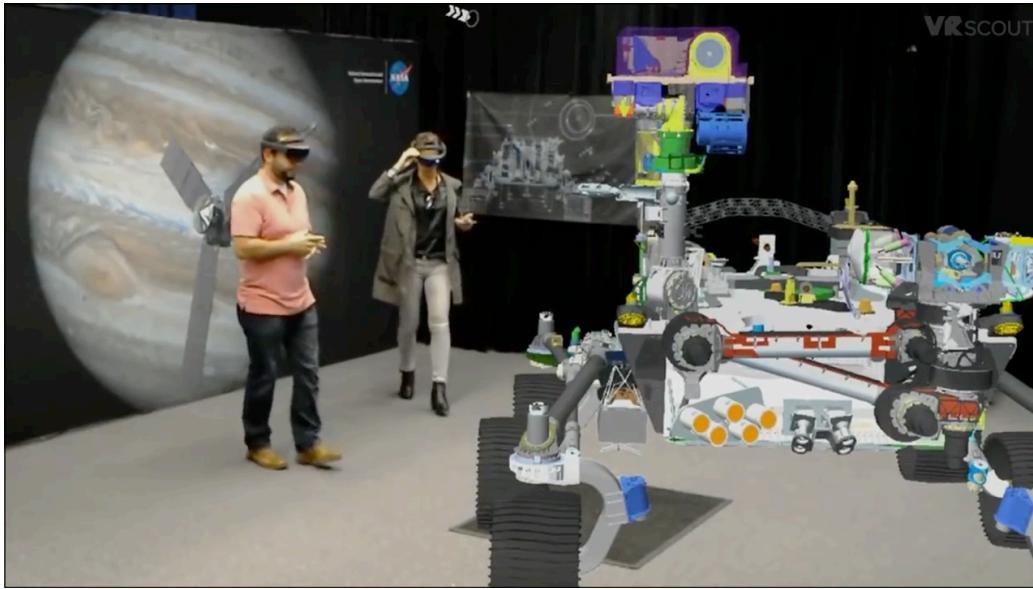
taking medical education  
to the next level

**ANIMA RES**  
Studio for 3D medical animation

Diagetic - In-scene indicators (presenting information)

Argument for planes

*The less realist the shape is, the easier the user can understand it's a foreign element, and be enticed to start interacting with it.*



### Diagetic - Moving Around

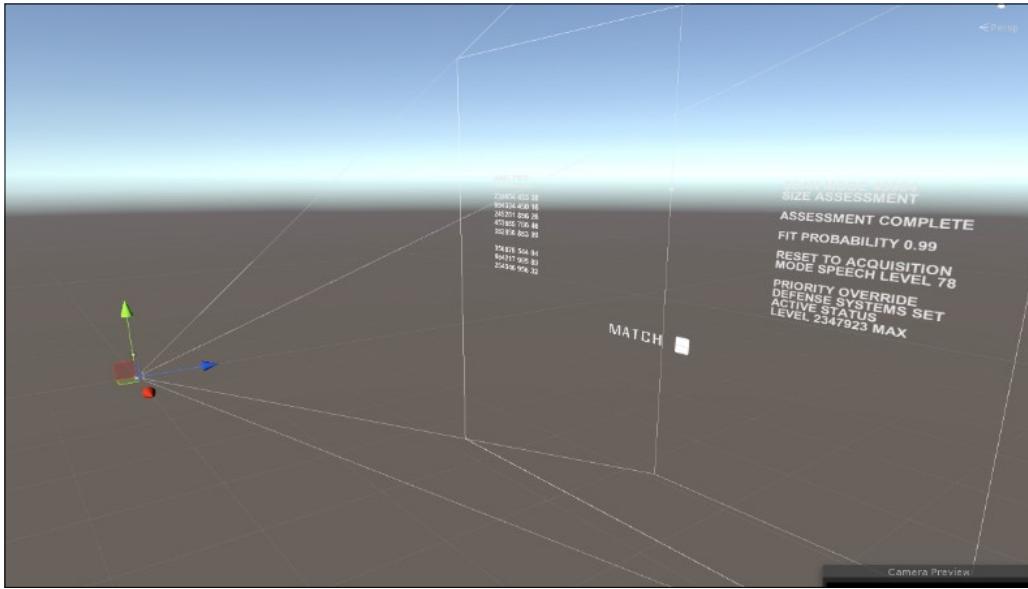
Discover new info about scene by moving around and actually looking from different points of view.

Interaction can be built around this - not just passive “looking”



(Aside)

Someone on the hololens team at Microsoft posted a tutorial to recreate the Terminator HUD on hololens...



(Aside)

Someone on the hololens team at Microsoft posted a tutorial to recreate the Terminator HUD on hololens...

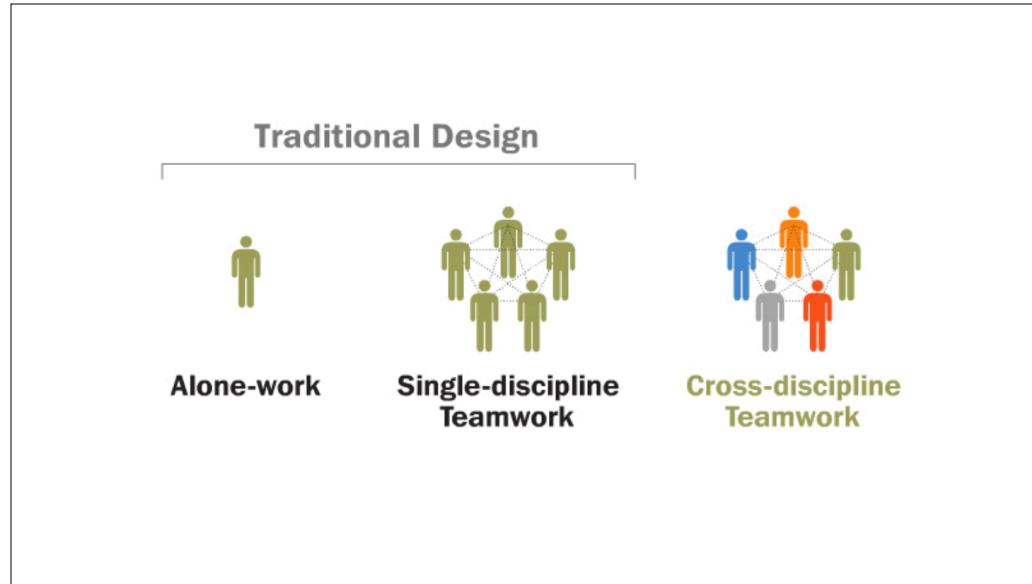


...of course they tested it on their pets

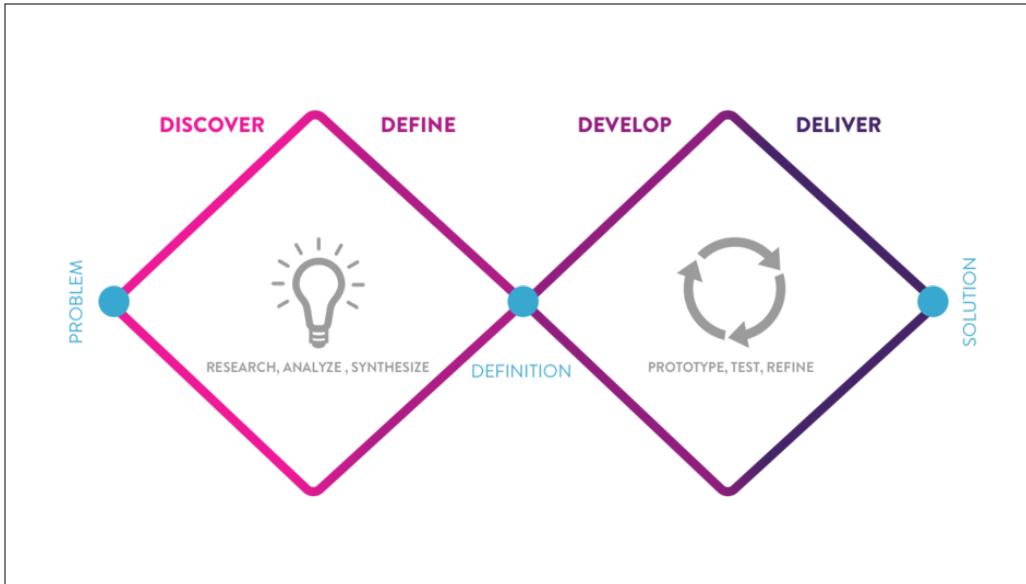


IMITATING A MOVIE IS TOTALLY VALID!

This is a totally valid scope for a final project *if the information presented somehow relates to and uses the real space.*



Continue the design process that we started last week

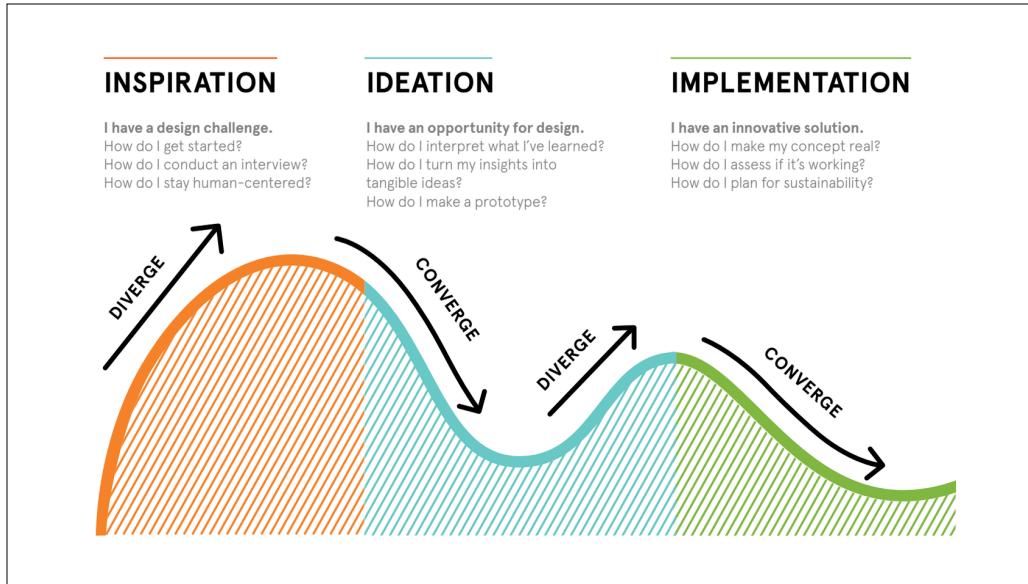


Double Diamond is the name of a design process model developed by the British Design Council in 2005

Alessi, BSkyB, BT, LEGO, Microsoft, Sony, Starbucks, Virgin Atlantic Airways, Whirlpool, Xerox, Yahoo!

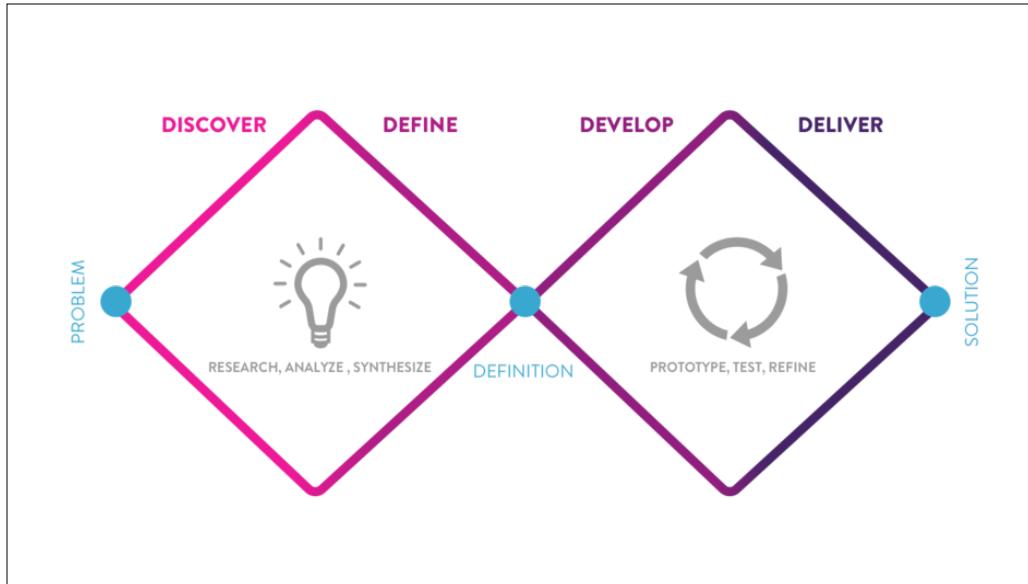
*Different designers manage the process of design in different ways. But when we studied the design process in eleven leading companies, we found striking similarities and shared approaches among the designers we talked to.*

Very useful to structure development of ideas when otherwise so open ended



## Ideo Human Centered Design

*Phases of this process are either diverging or converging. During a diverging phase, you try to open up as much as possible without limiting yourself, whereas a converging phase focuses on condensing and narrowing your findings or ideas.*



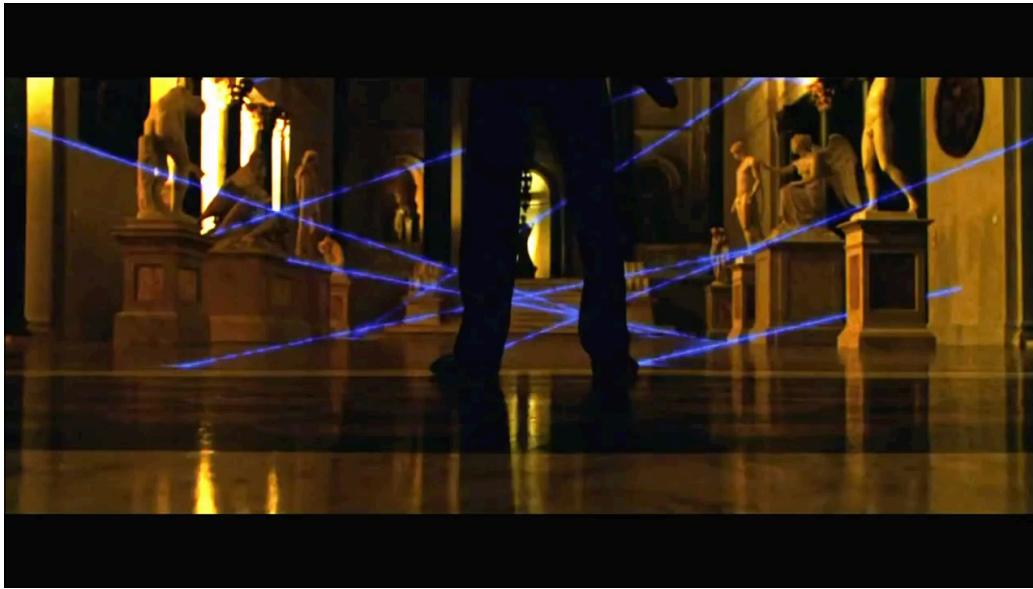
Not equal time....equal weight

**Discover** – The first quarter of the Double Diamond model covers the **start of the project**. Designers try to **look at the world in a fresh way, notice new things and gather insights**.

**Define** – The second quarter represents the definition stage, in which designers try to **make sense of all the possibilities identified in the Discover phase**. Which matters most? **Which should we act on first? What is feasible?** The goal here is to develop a clear creative brief that frames the fundamental design challenge.

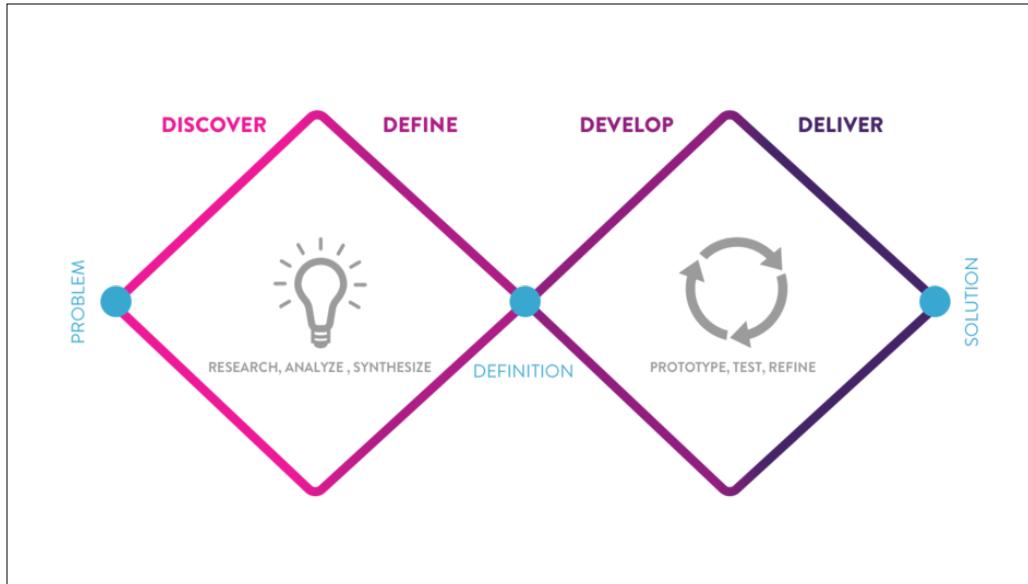
**Develop** – The third quarter marks a period of development where **solutions or concepts are created, prototyped, tested and iterated**. This process of trial and error helps designers to improve and refine their ideas.

**Delivery** – The final quarter of the double diamond model is the delivery stage, where the **resulting project** (a product, service or environment, for example) is **finalized, produced and launched**.



Continue design process with LASERs

This will be our product - let's go through the rest of the process with it



We did **Discover**

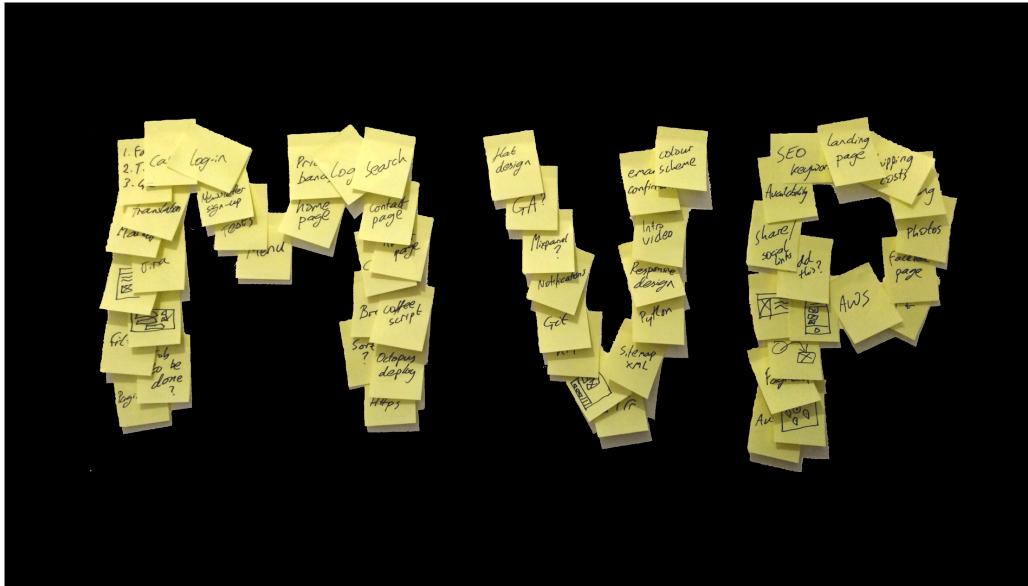
Now let's do **Define**



Break down into small, bite-sized pieces

Recap Tools available to us

- Voice
- Look
- “AirTap”
- Movement



## Minimum Viable Product

The Lean Startup - by Eric Ries

*Maximum amount of validated learning about customers with least effort.*

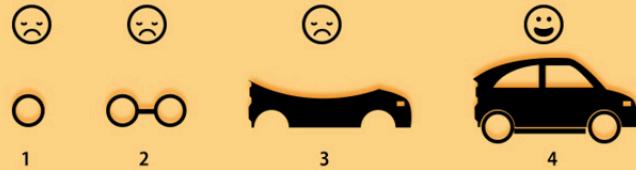
*(Grown to mean a lot more than it was originally)*

**Riskiest Assumption Test** - There is no need to build more than what's required to test your largest unknown.

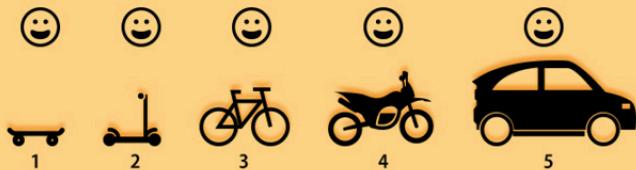
**No expectation of perfect code or design.** No danger it will prematurely become a product.

## HOW TO BUILD A MINIMUM VIABLE PRODUCT

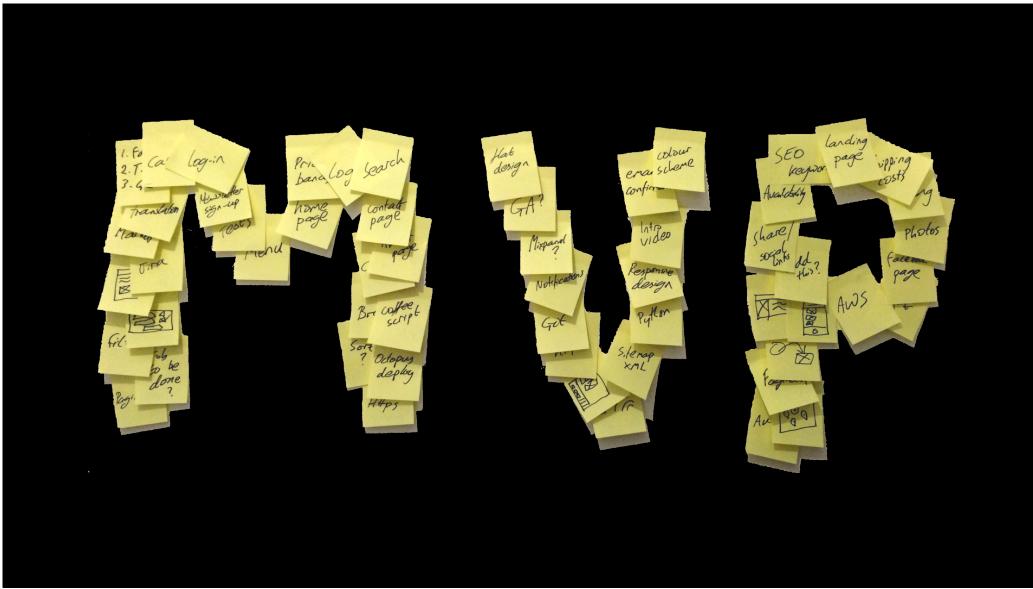
### NOT LIKE THIS



### LIKE THIS



Very quickly get to something usable that gets you “from point A to point B”



## So, What is our MVP?

## **Non-Obvious User Interactions**

Ok, so we have MVP, but how do we get the user there.

# Instructions

Narrative vs Utilitarian

“Hello Special Agent X. I see you’ve arrived at our training facility...”

“Walk without touching the lasers”

# Levels? Parts?

Do we have multiple levels?

Do they increase in difficulty?

How do we define how a level has ended?

# Does Experience Have an End?

why? (goal)

What is our endgame?

- 1) Go until you die? = open ended
- 2) reach specific level

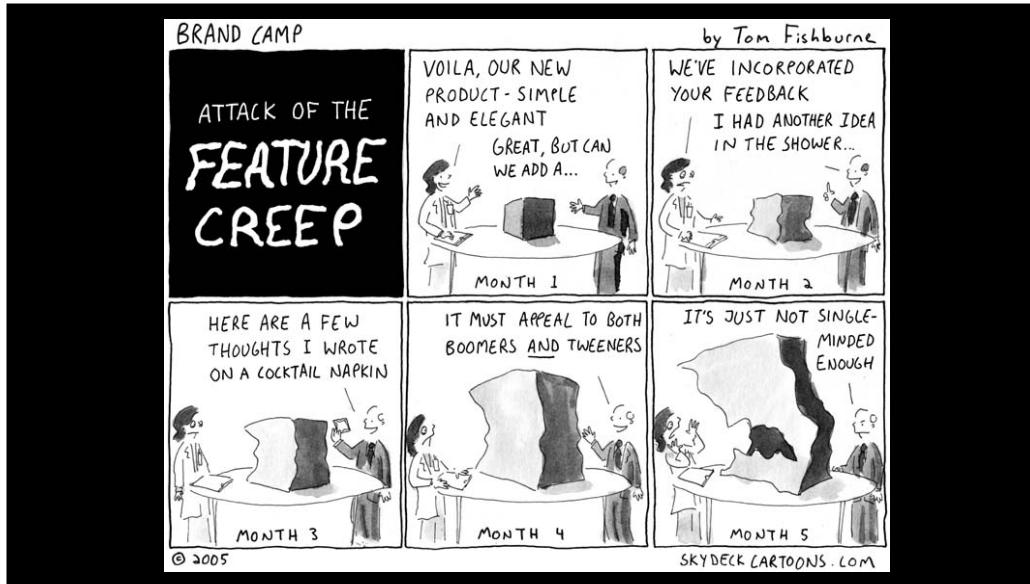
# Managing Information and States

What info do we need to present to user?

- What level are we on?
  - Levels get more complicated as we move along.
  - How?
    - More obstacles
    - Moving obstacles
- What score?
- Have you finished level?

What info do we need to keep track of?

- States?
  - Level Finished/Building new level
  - Game over
- Health/Lives?



Beware of adding too much *incrementally*



Probably really fun to make, but useless

while a number is greater than zero,  
do the following:  
Add the number to the running total.  
once the number is greater than zero

# pseudocode

## PSEUDOCODE

Pseudocode is an informal **high-level description** of the operating principle of a computer program or other algorithm.



Lets talk sandwiches

<https://www.youtube.com/watch?v=DvIHYdI0MWc>

How specific do you have to be with what you tell the computer?\

All of you need to know enough logic about how the code works to write pseudocode.



## Overview

Break into groups and decide how you want to answer these questions.



What's coming:

On thursday, we should be able to get to demonstrating adding some of these actions to the apps that we make.

Voice interaction

Gaze Tracking

Detecting an air tap

Simulating our hololens applications

The point is that adding these interactions is possible and relatively easy.

**Hello Unity**

<http://bit.ly/1SlXn9P>

**Daniel Shiffman**

**Computer Programming for the Total Beginner  
and  
The Nature of Code**

<http://bit.ly/2vuyhA7>

Hello Unity is a great place to start that would specifically help you in this class. He covers a good intro to Unity as well as coding in general.

One of my favorite general learn-to-code resources is anything by Daniel Shiffman at NYU. He has a series of videos called Computer Programming for the Total Beginner, but once you've got the very very basics down (what are variables? what are functions?) I would highly recommend his Nature of Code videos.

**Designing for Mixed Reality - Chapter 5**

<http://goo.gl/GzjTL3>

**Design For Humanity - Parts 4,5**

<http://goo.gl/mWoxTm>

Reading/watching assignment:

<http://www.oreilly.com/design/free/designing-for-mixed-reality.csp>

<https://medium.com/swlh/how-to-design-a-cui-59f1fb3f35fc>

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Thank you!