



**Altium**®

**ALTUMLIVE 2018:**  
**ENGINEER TO ARCHITECT**  
*LEVERAGING DESIGN THINKING FOR BETTER PRODUCTS*

**Jeremy Blum**

Director of Hardware

 SHAPER

**San Diego**

October 4<sup>th</sup>, 2018



## Objective



SHAPER

**Altium**<sup>®</sup>

**To impart the processes and principles that we employ at Shaper to architect electromechanically sophisticated products that balance:**

- *manufacturability*
- *technical performance*
- *aesthetic beauty*
- *user experience*

*...from the perspective of an Electrical Engineer*





SHAPER

**Altium**<sup>®</sup>

## Traditional Thinking Principles

*contingency plans*

*think*

*market plan*

*present*

*analyze*

*linear*

## Design Thinking Principles

*fail fast*

*do*

*customer stories*

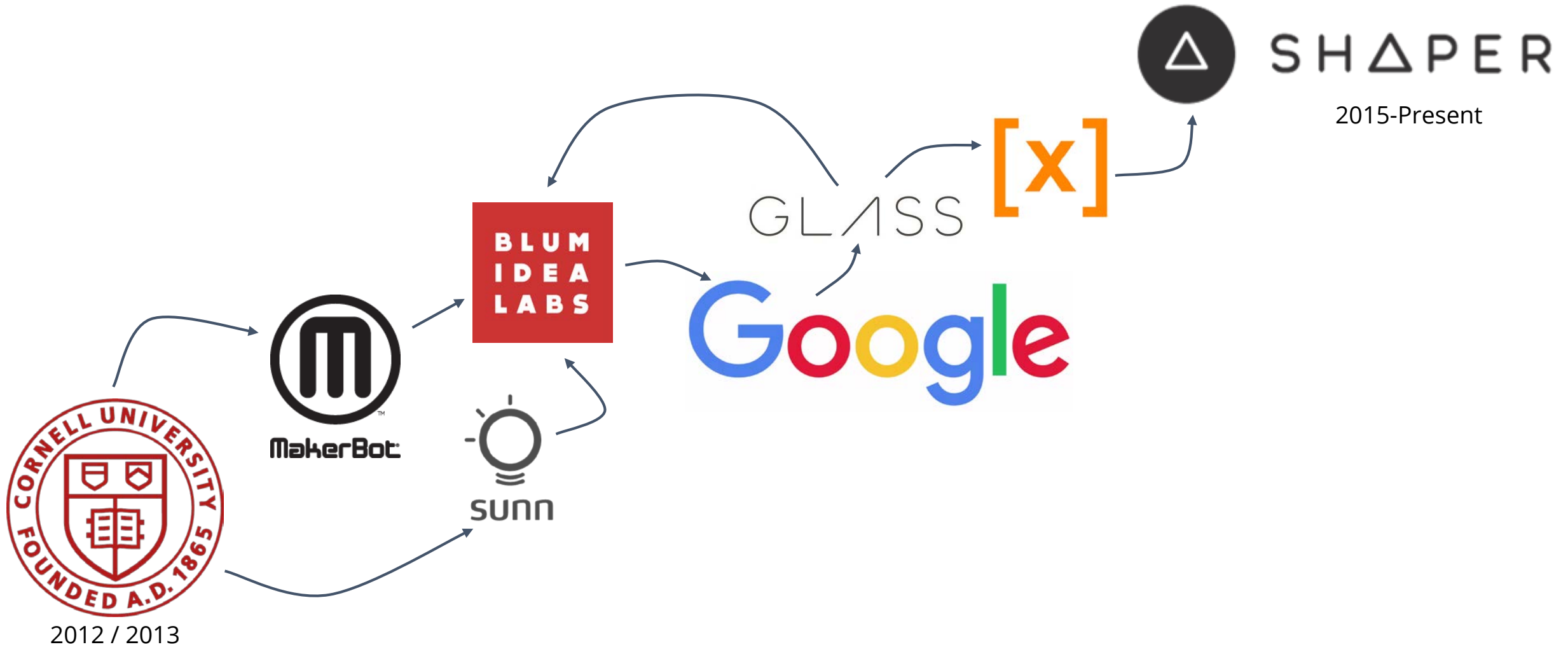
*experiment*

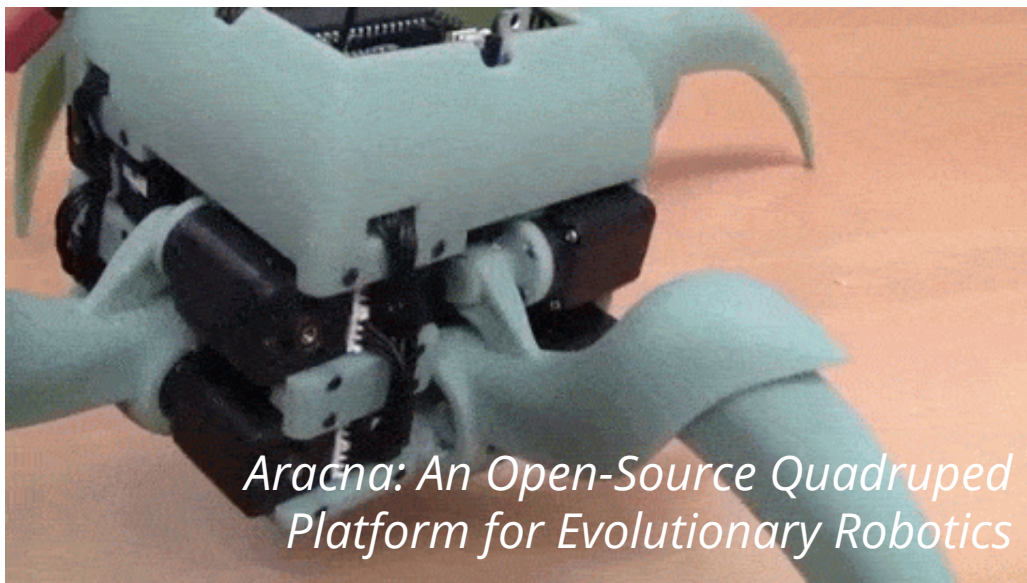
*test*

*continuous*

- 1 Background**
- 2 Executing a “Design Thinking” Approach
- 3 Pieces of the Product Puzzle
- 4 Zoom Out
- 5 Zoom In



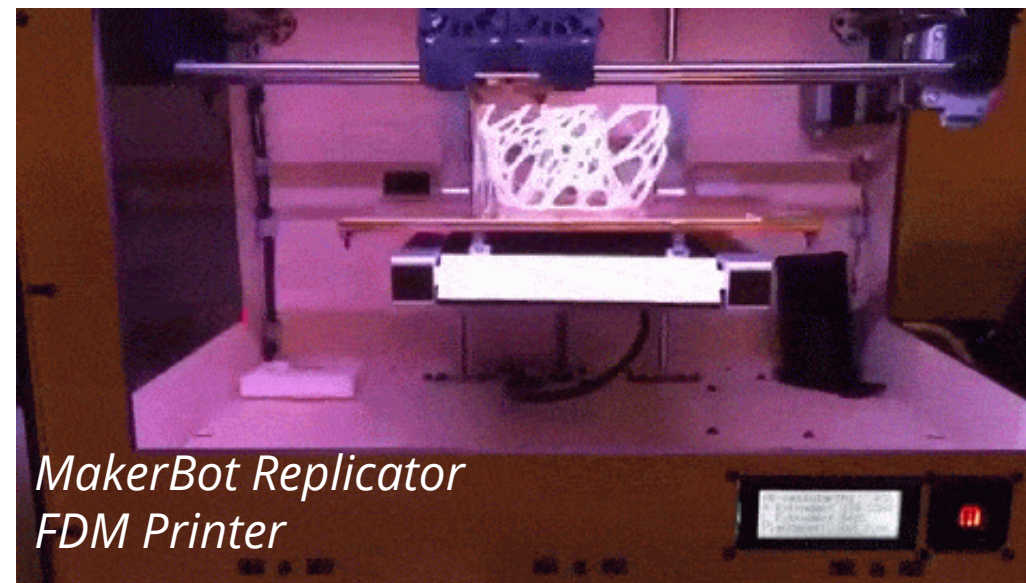
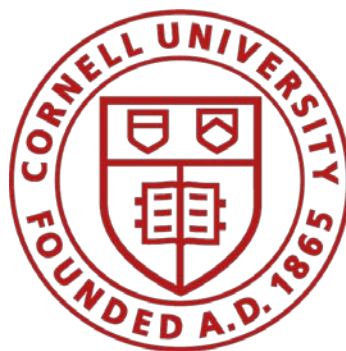




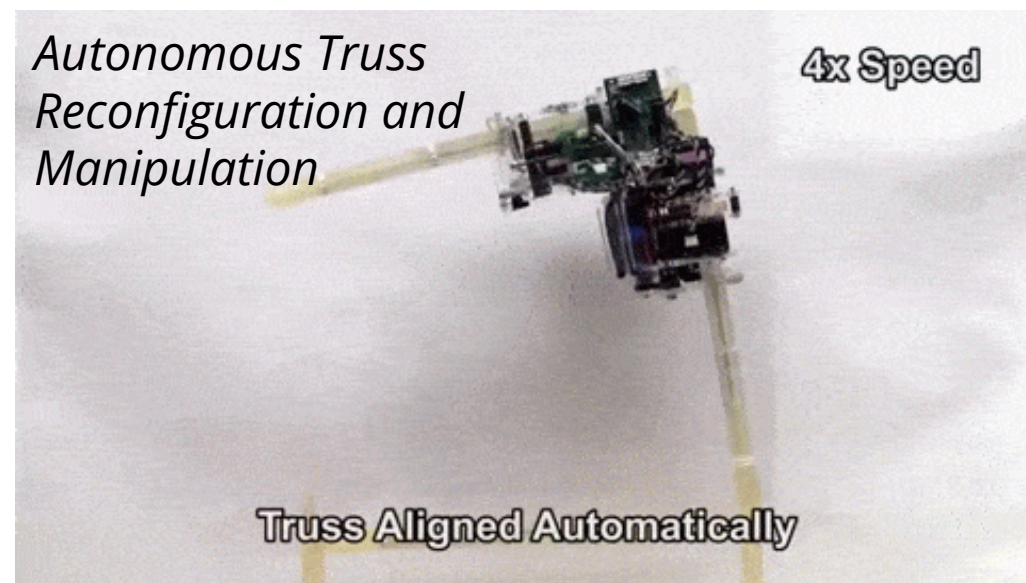
*Aracna: An Open-Source Quadruped Platform for Evolutionary Robotics*



*CUSD & Silo House*



*MakerBot Replicator FDM Printer*



*Autonomous Truss Reconfiguration and Manipulation*

**4x Speed**

**Truss Aligned Automatically**



# Background / Google [X] & Glass

United States Patent  
Kubba et al.  
US 9,807,490 B1  
Oct. 31, 2017

United States Design Patent  
Kim et al.  
US D776,059 S  
Jan. 10, 2017

United States Patent  
Blum et al.  
US 9,294,739 B1  
Mar. 22, 2016

United States Patent  
Blum et al.  
US 9,719,871 B2  
Aug. 1, 2017

United States Patent  
Blum et al.  
US 9,294,739 B1  
Mar. 22, 2016



Wearable Intelligence Software on Google Glass





# Background / Shaper Origin



SHAPER

**Altium**<sup>®</sup>







# Background / Shaper Origin



SHAPER

**Altium**<sup>®</sup>





### **Why use Shaper Origin as a case study for the application of design thinking by electrical engineers?**

*Our unofficial company (and product) motto is: "GSD" - GET. SHIT. DONE.*

*Origin is a mass-manufactured and individually-calibrated precision robot that we are selling to be treated like a power tool.*



- 1 Background
- 2 Executing a “Design Thinking” Approach**
- 3 Pieces of the Product Puzzle
- 4 Zoom Out
- 5 Zoom In

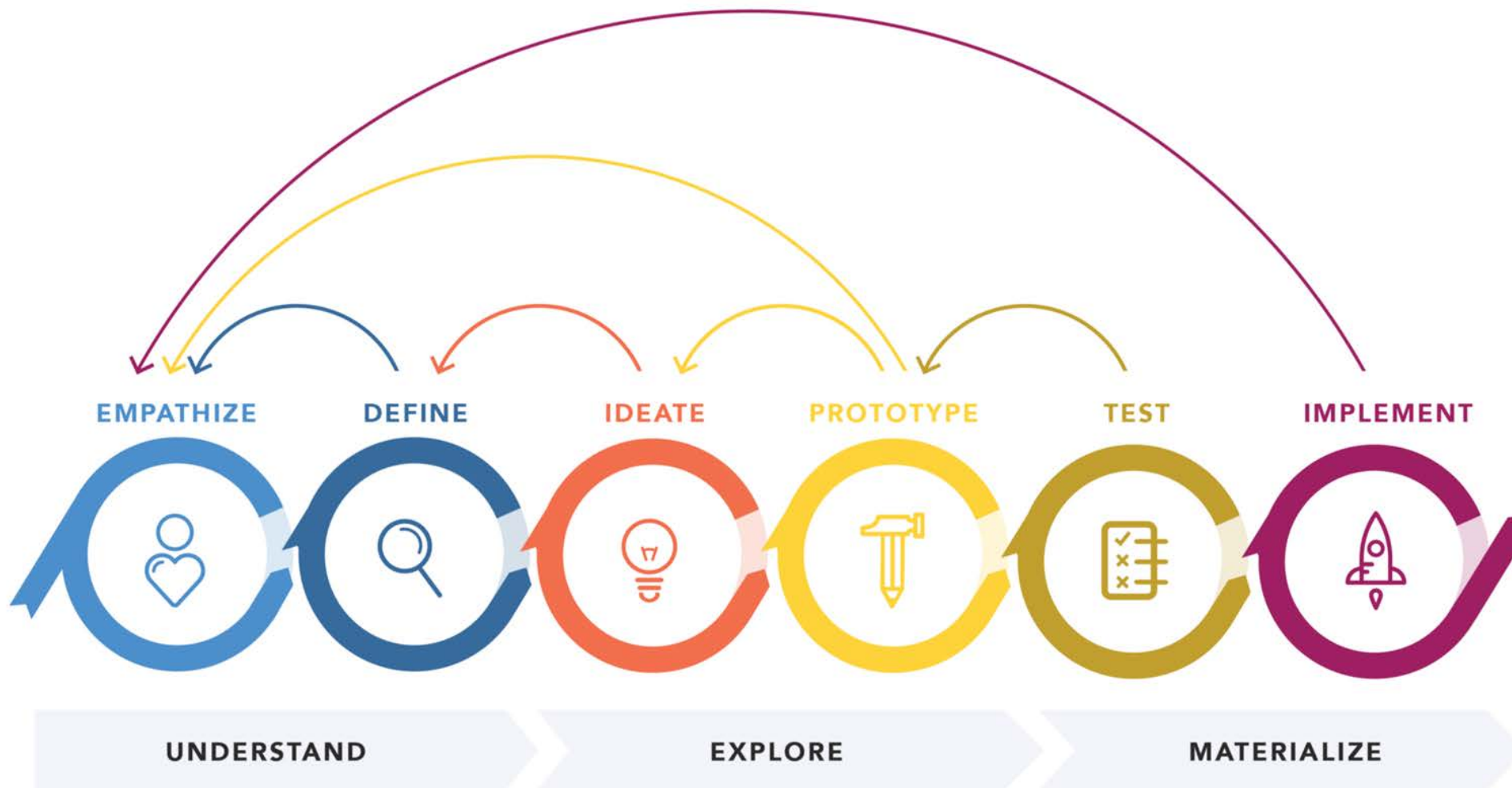
# Traditional Thinking



SHAPER

**Altium**<sup>®</sup>

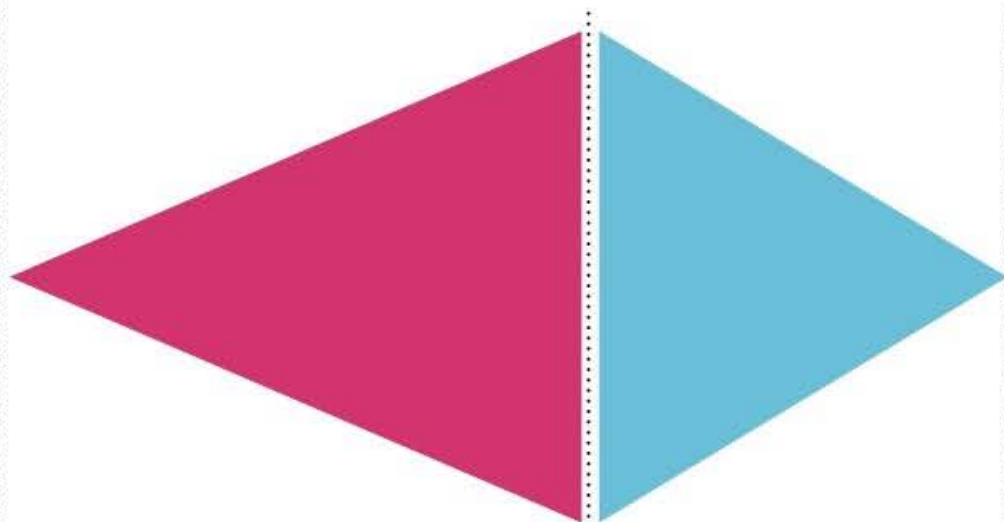






# Understand

Understanding ends in **Insight**.

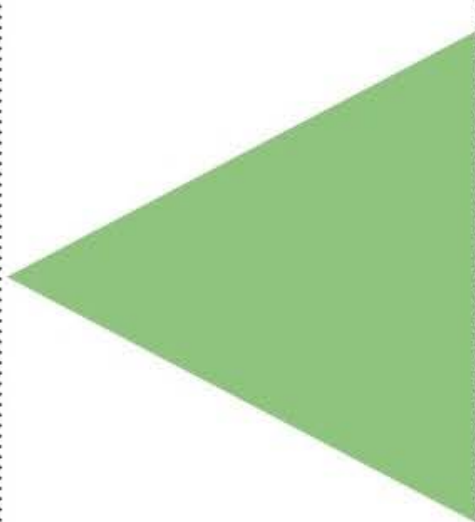


*Empathy*

*Define*

# Create

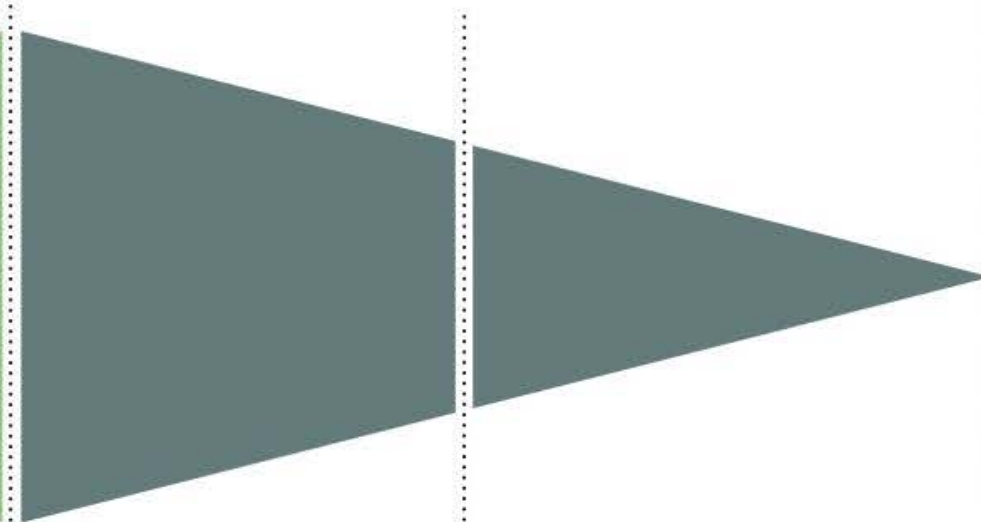
Creation ends in **ideas**.



*Ideate*

# Deliver

Delivery ends in **reality**.



*Prototype*

*Test*

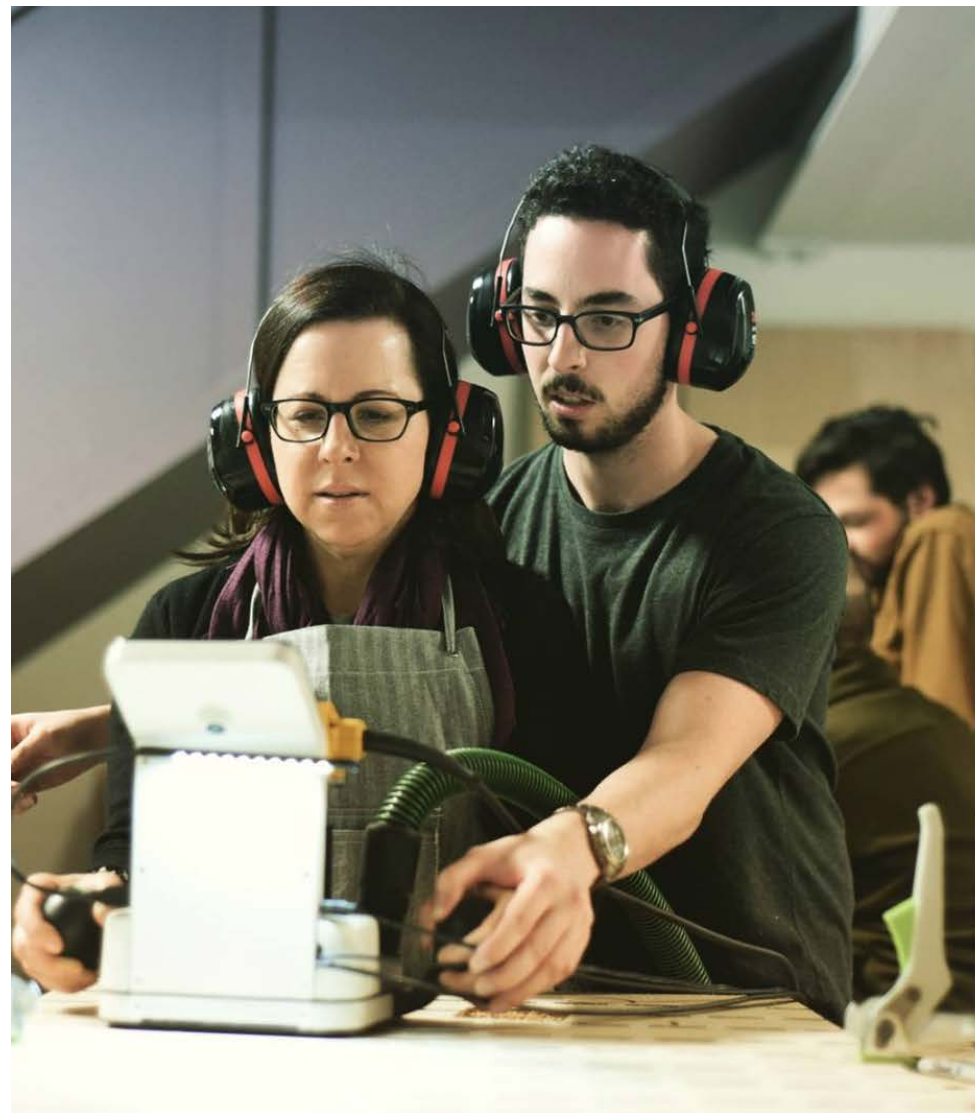


# Design Thinking / Empathize the Product



SHAPER

Altium®



**shapertools**  
Oakland, California

**shapertools** Jeremy (@sciguy14) subjects a Shaper Origin prototype to the "Can my mom use it?" test. #shapermade #makermom

**funktionhouse** When oh when can we expect these to be available? Can we get on your Beta testing shop?

**marcelmarcball** keep on truckin guys, this smart router invention is really awesome. I like the way that it uses the human operator as a cheaper less resource intensive way to do what CNC gantries do

**shapertools** @funktionhouse We're working on getting Shaper Origin to market later this year.

**funktionhouse** Looking forward to it @shapertools

**ilaroorg** can you give a aprox number?



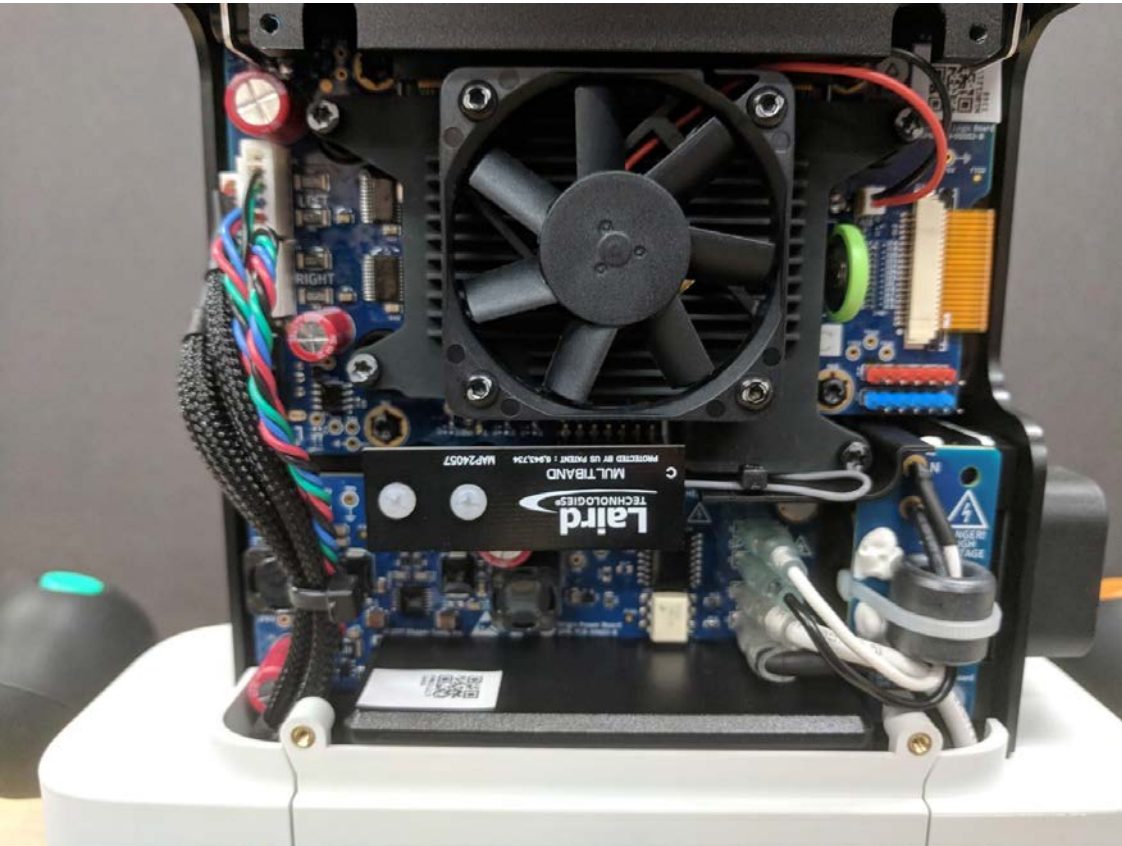
47 likes

DECEMBER 16, 2015

Add a comment...

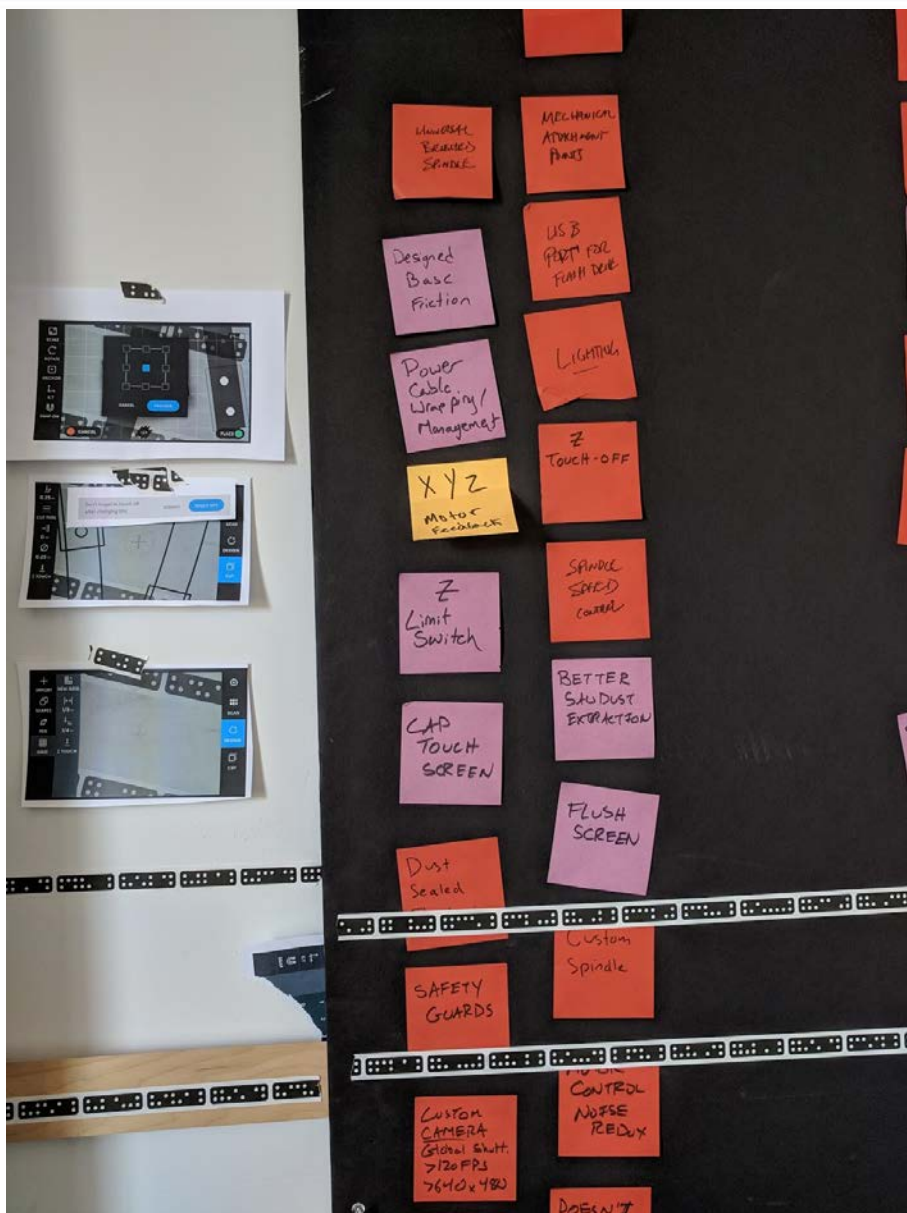






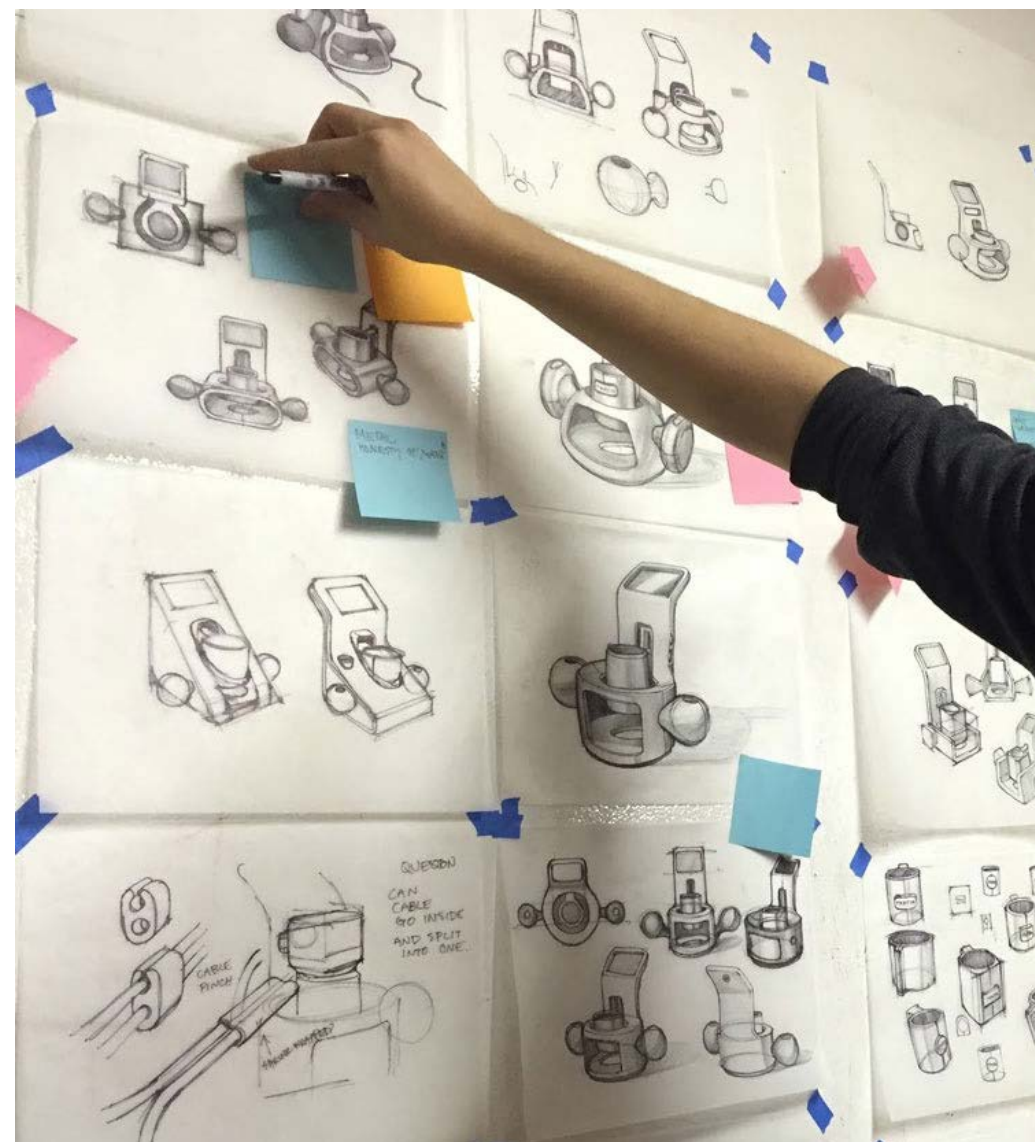
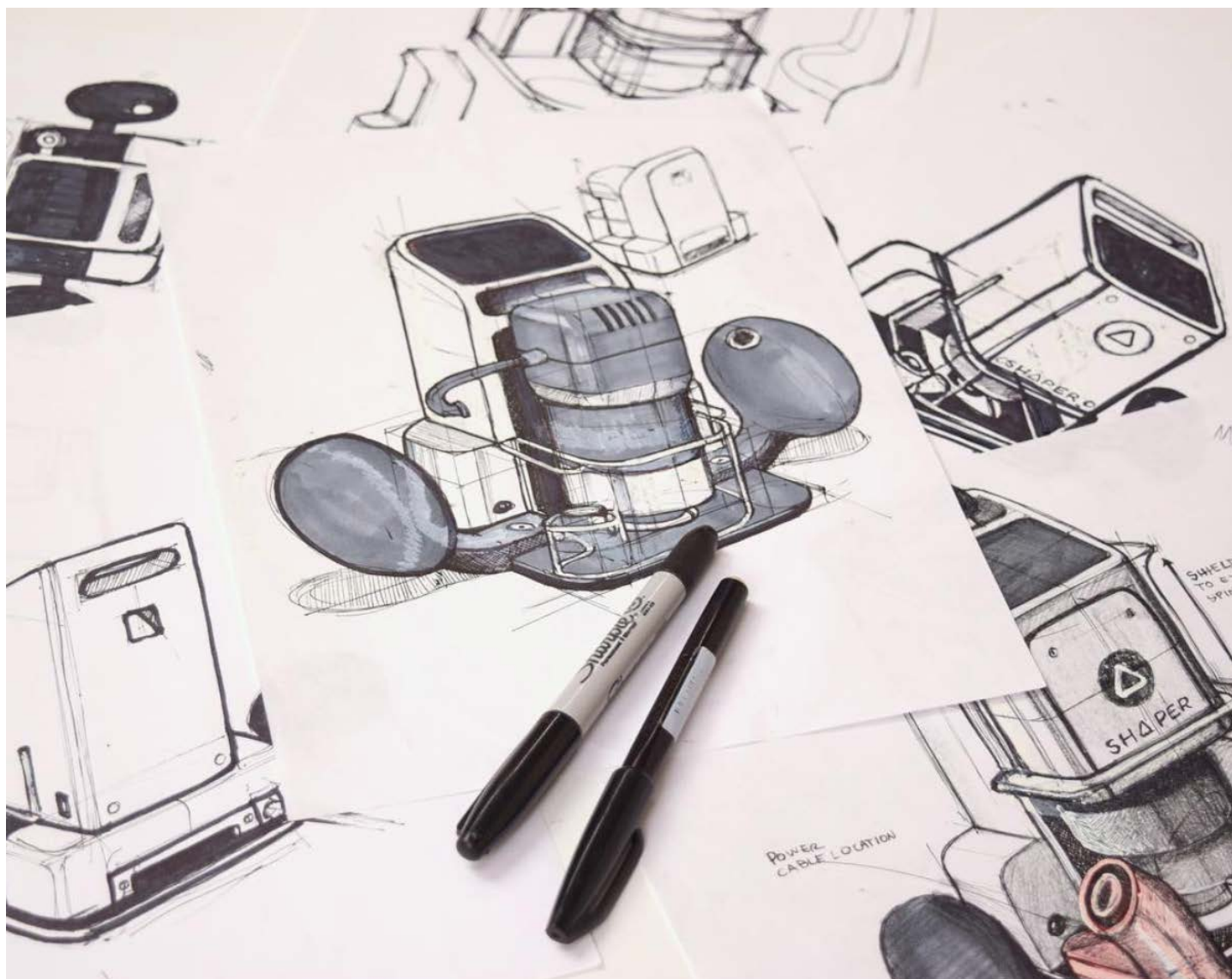




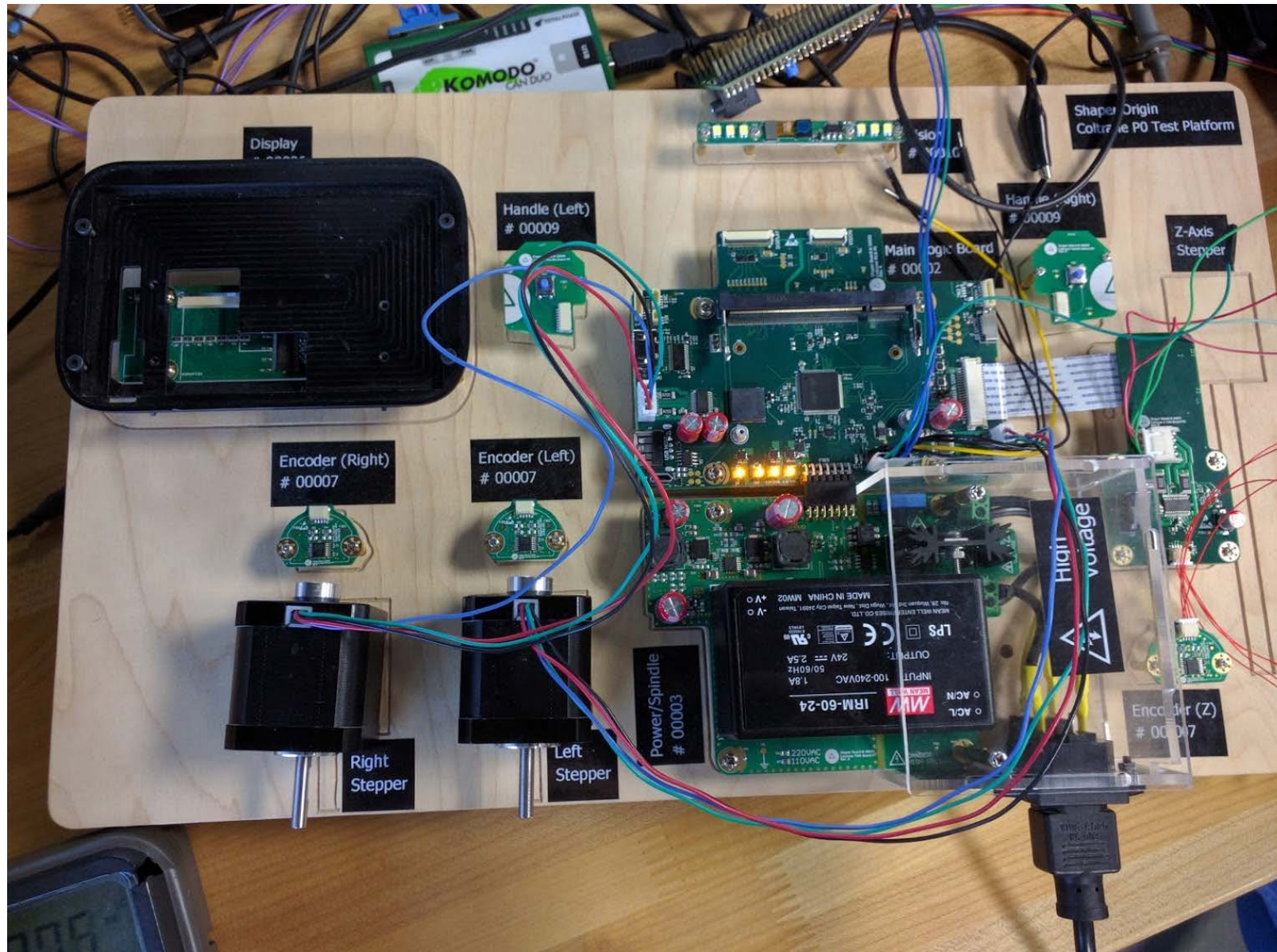


Narrow the ideas based on how they will resonate with your end-customer, NOT based on their feasibility of implementation.

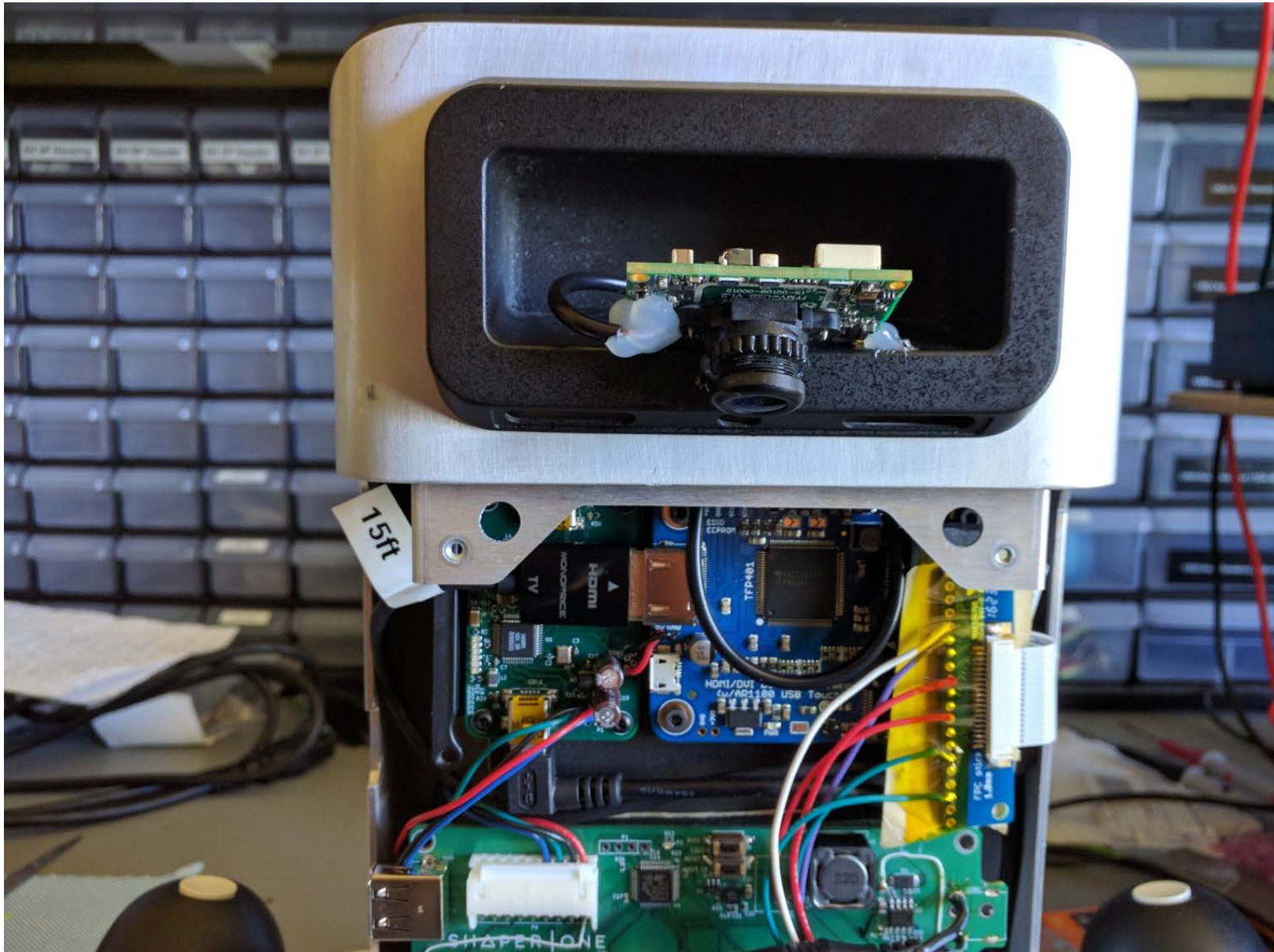




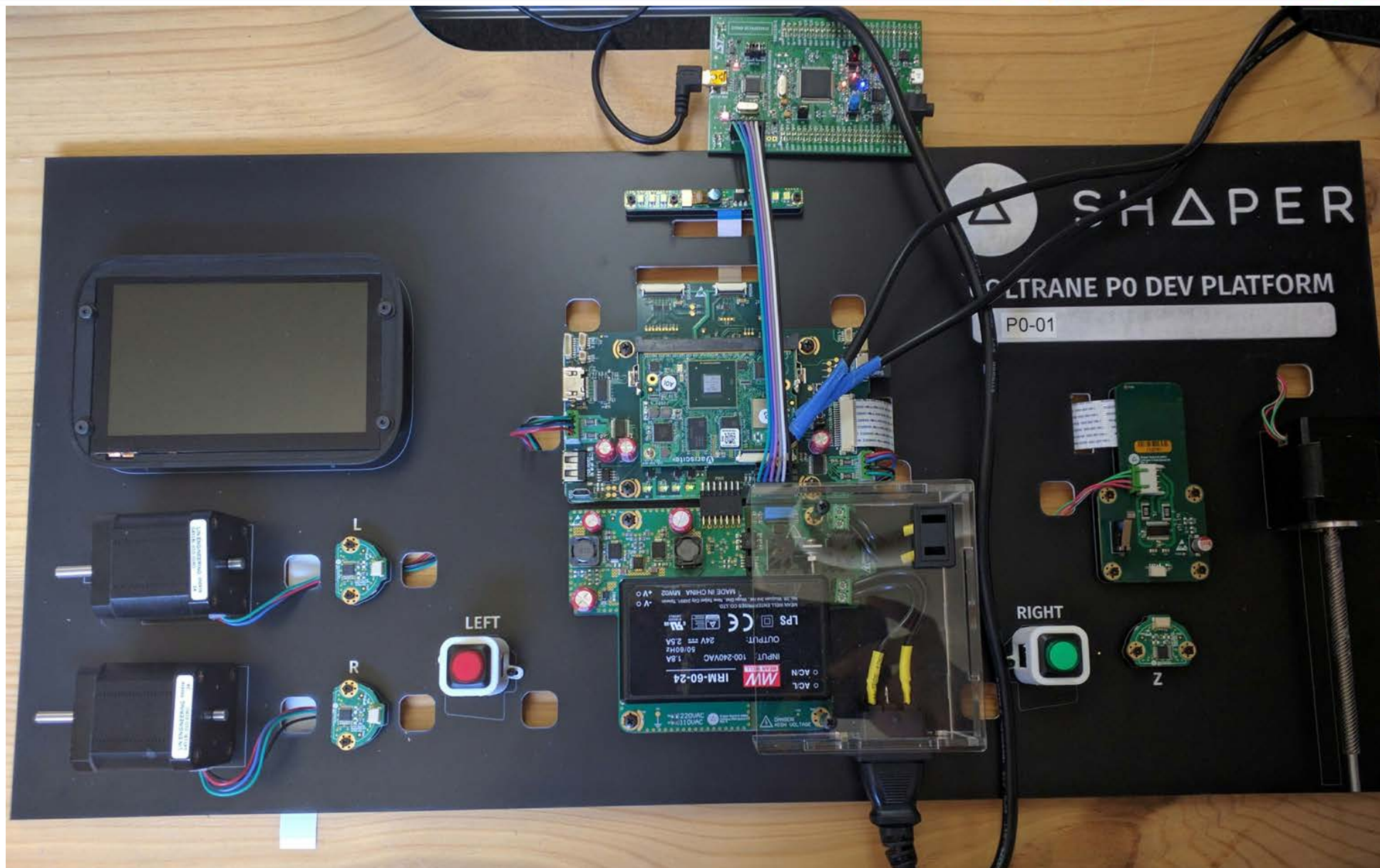




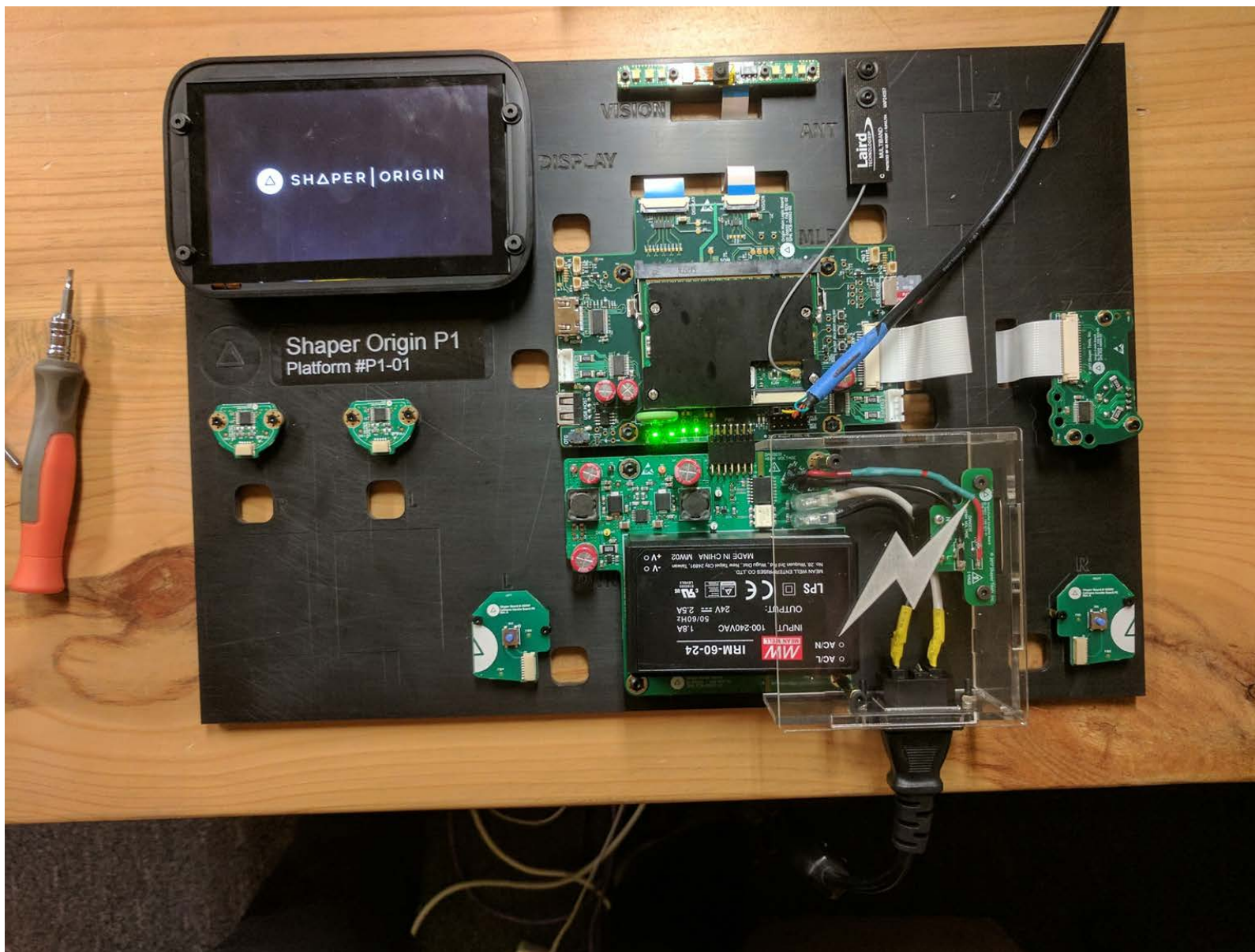










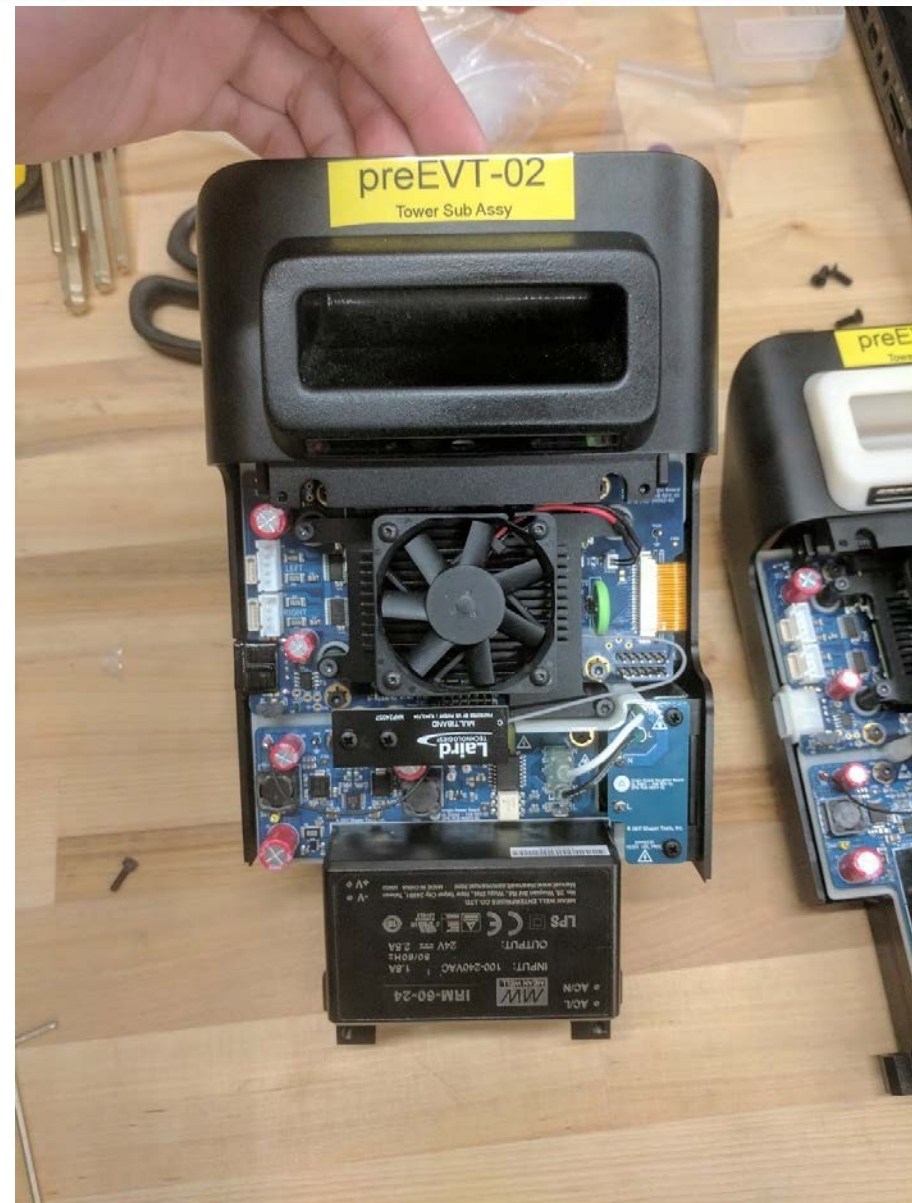
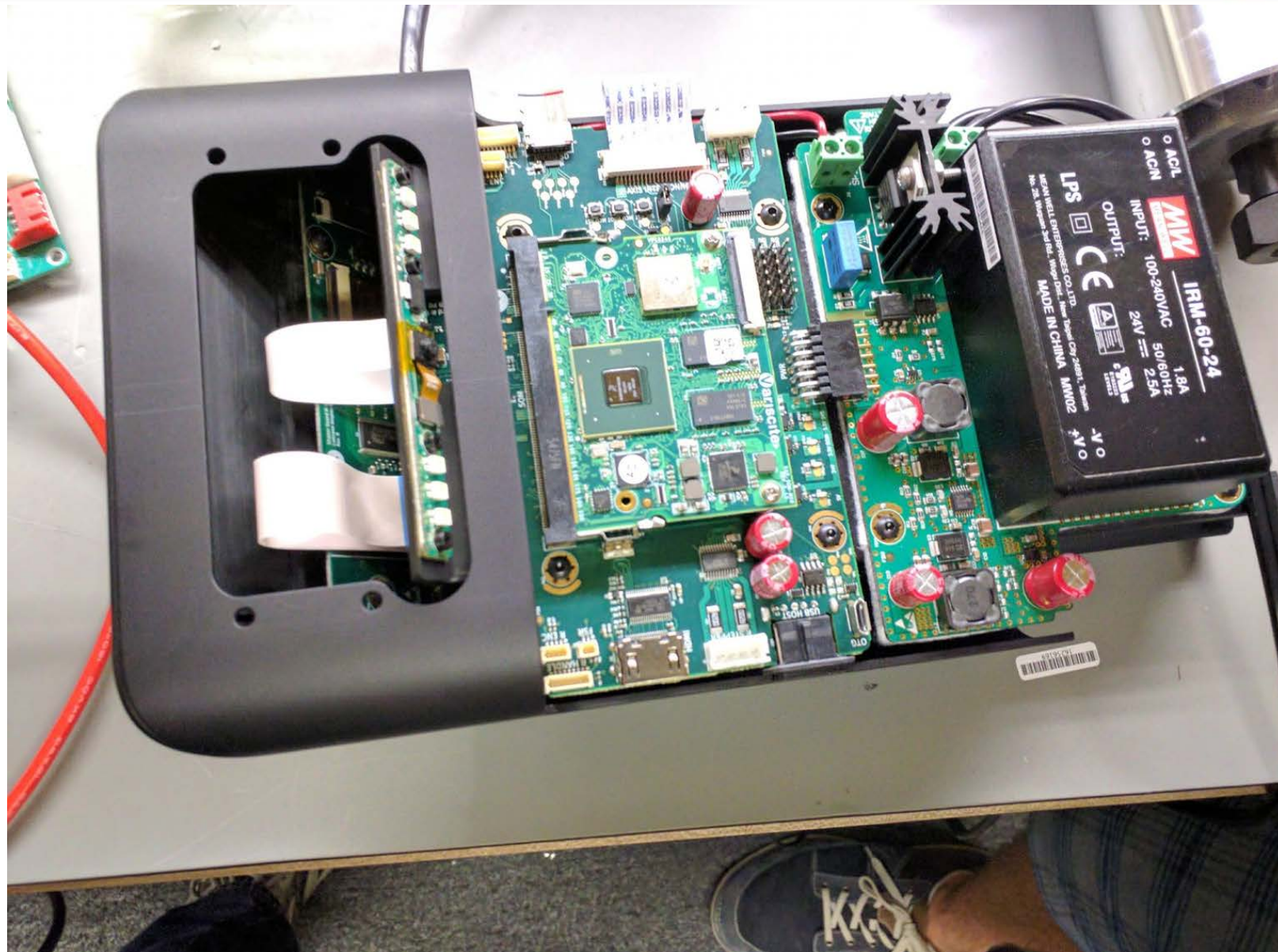






















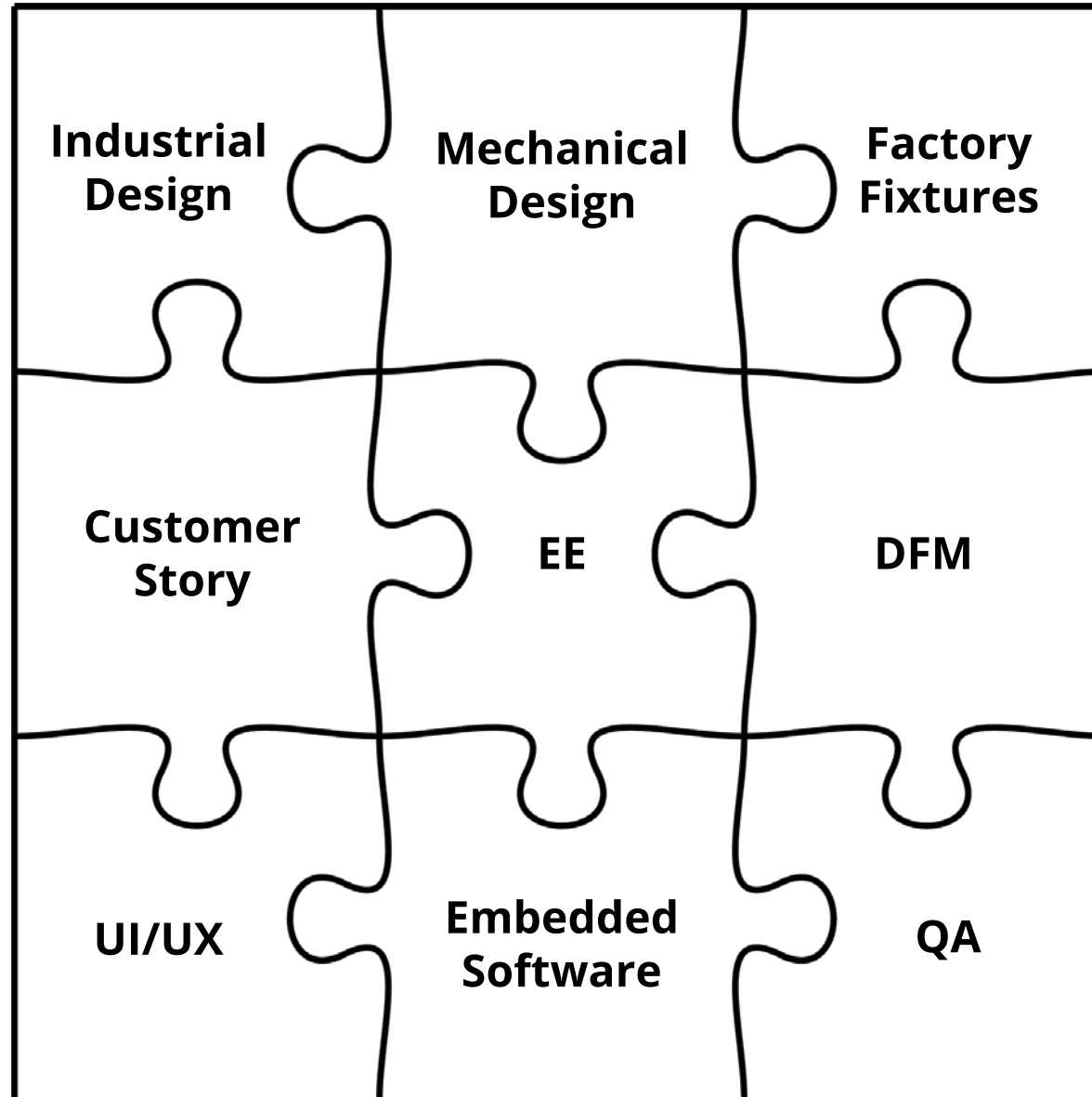




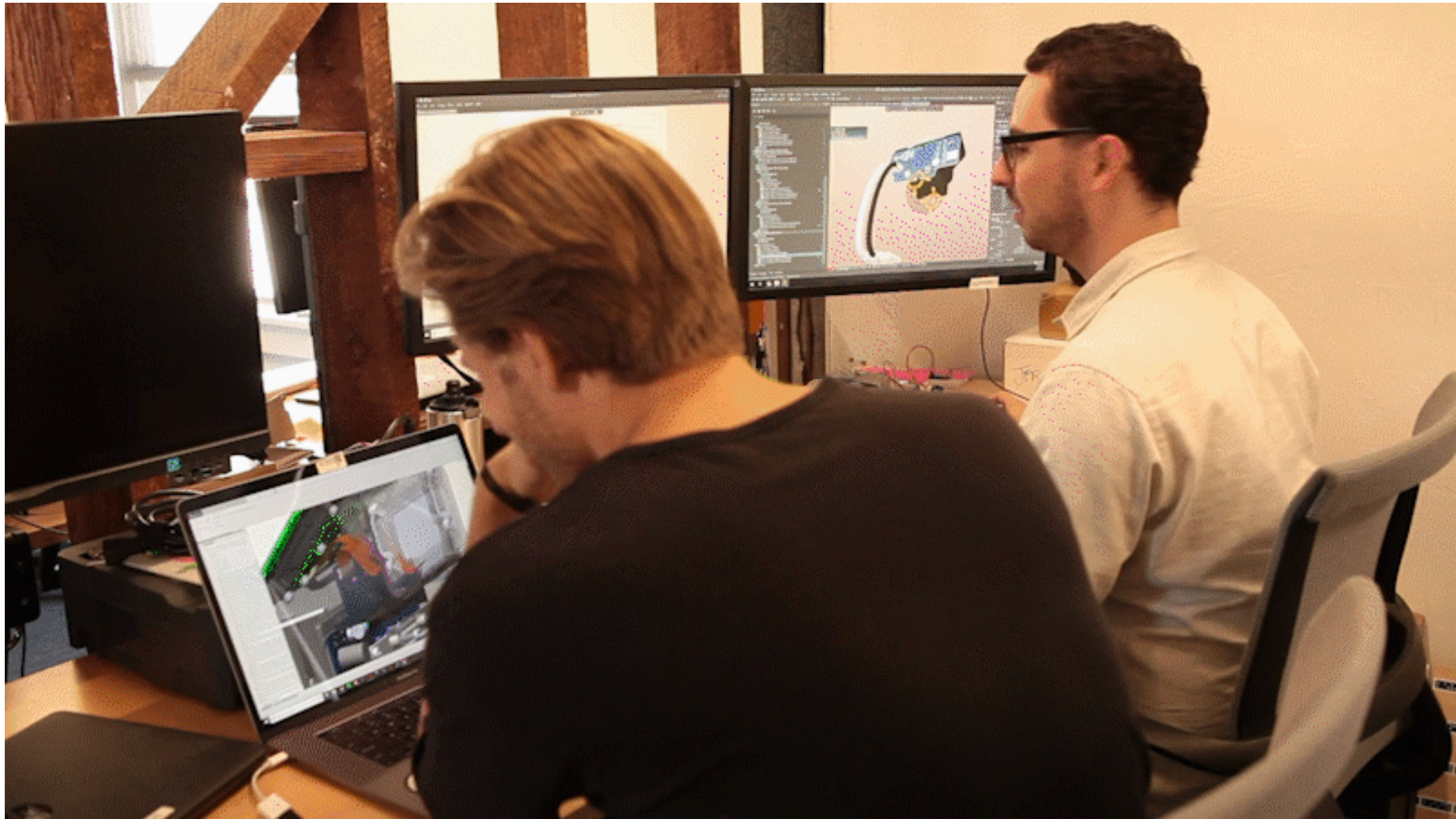




- 1 Background
- 2 Executing a “Design Thinking” Approach
- 3 Pieces of the Product Puzzle**
- 4 Zoom Out
- 5 Zoom In











- Friendly** Our tool should invite its users to engage with it.
- Simple** Our tool should be intuitive, both physically and digitally.
- Capable** Our tool should feel efficient, effective, and long lasting.









- 1 Background
- 2 Executing a “Design Thinking” Approach
- 3 Pieces of the Product Puzzle
- 4 Zoom Out**
- 5 Zoom In



# Zoom Out / Customer Stories



SHAPER

**Altium**<sup>®</sup>





- 1 Background
- 2 Executing a “Design Thinking” Approach
- 3 Pieces of the Product Puzzle
- 4 Zoom Out
- 5 Zoom In**



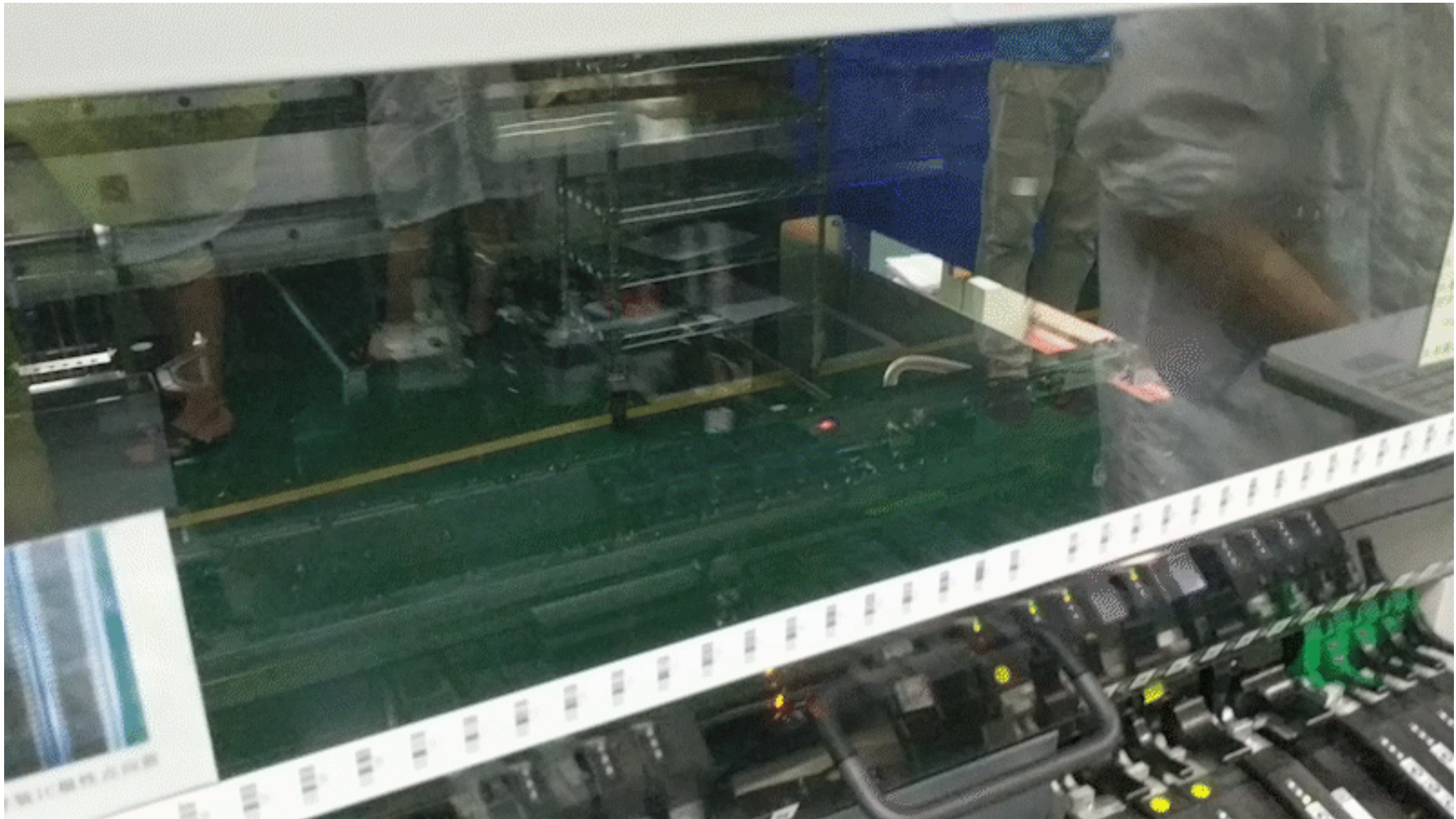
# Zoom In / Manufacturing



















# Recap

*empathize with your customers, colleagues, and vendors*

*be open-minded*

*don't force linearity*

*spend time in the weeds and at 10,000 feet*



[jeremyblum.com](http://jeremyblum.com)

---

[shapertools.com](http://shapertools.com)