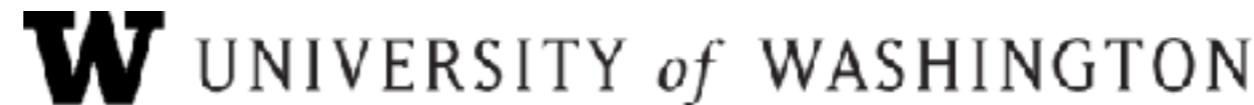


# UX + Engineering: Three Years in the Startup Trenches

Andy J. Ko, Ph.D.  
Associate Professor  
The Information School



# My background

- Computer Science (B.S.)
- Psychology (B.S.)
- Human-Computer Interaction (Ph.D.)
- I'm trained in UX research, UX design, and Software Engineering

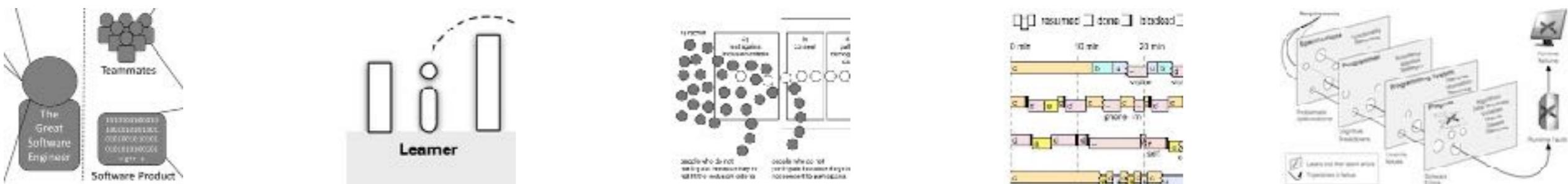
# Also a tenured professor

- I discover truth and tell my colleagues about it (*research*)
- I tell people what my colleagues and I have found (*teaching*)
- I also design curriculum, run admissions, fundraise, budget, hire, fire, consult, design space, peer review, mentor, plan conferences, advocate, testify, etc.

I've invented dozens of productivity tools for testing, debugging, and design.



I've investigated all kinds of issues in software engineering team dynamics.



“Why aren’t all of these cool  
inventions and discoveries  
used in practice?”

I decided to find out.

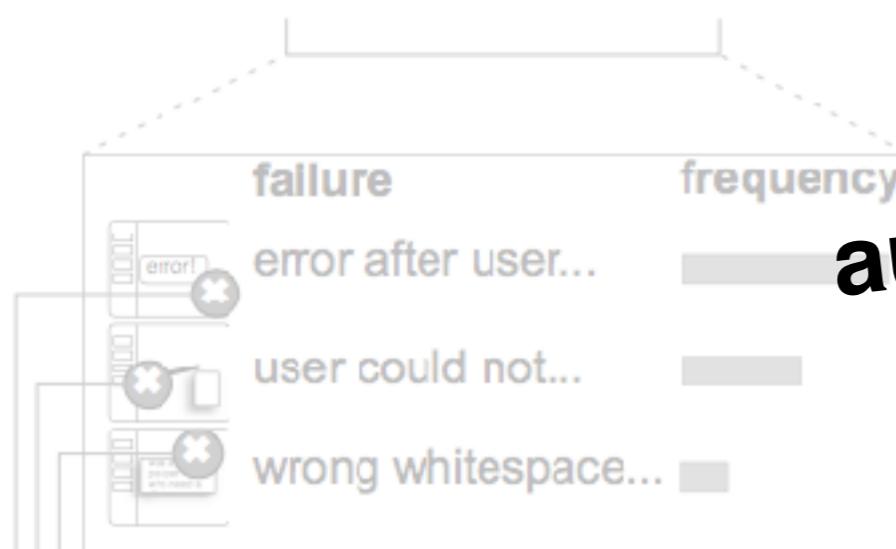
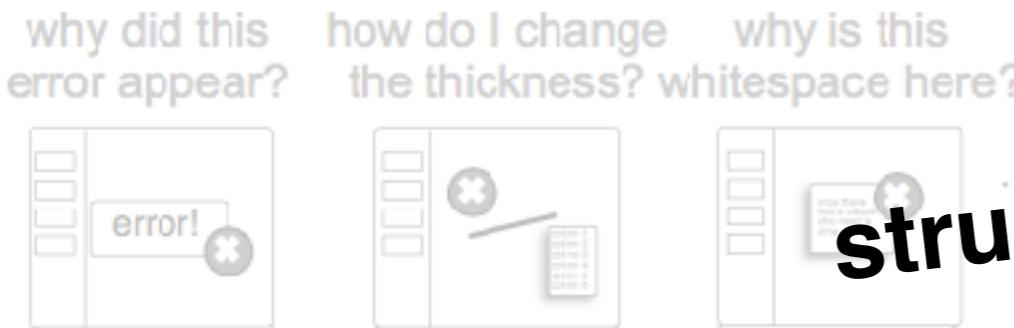
# Outline

A 7-year story of turning a research project into a 20+ person business. ( *AnswerDash.*)

My reflections on interactions between design and engineering

# I WRITE AN NSF GRANT (2009)

capture. These plans include five major activities:



**structured question asking**  
**aggregate requests**

I will enable help questions in a set of web-based courseware applications developed at the University of Washington (in addition to in-house test applications). To do this, I will generalize the prototype in Figure 1 to interactive web applications, adding support for new kinds of “why” and “how” questions to extend the range of detectable issues.

I will gather users’ help questions at a large scale, exploring different ways of requesting users’ permission to report information. I will also explore how privacy, consent, and training influence the representativeness of reported help data.

I will invent techniques for incrementally grouping questions over time, aggregating large-scale feedback into meaningfully distinct groups. These tools will analyze the input and output contexts of users’ questions, producing generalized, executable test cases.

**automatic issue triage**

I will invent analysis tools helping software teams aggregate issue data over time, successive software versions, and customer data. These tools will integrate data from other forms of software testing, such as crash reports and user tests. I will assess these tools’ ability to help teams make more evidence-based judgements of issue *frequency* and *severity*.

# PARMIT CHILANA JOINS MY LAB (2010)



# PARMIT INVENTS LEMONAID (2011)

Search Calendar

Today < > Apr 9 – 15, 2012

Mon 4/9 Tue 4/10 Wed 4/11 Thu 4/12 Fri 4/13

Questions and comments by other users...

Search

How do I sync the calendar with my iPhone? [1] 76 thumbs up  
How do I change the color of repeating e... [1] thumbs up me too  
Can I color code today's events? [0] thumbs up me too  
Why is today's day shown in gray? [0] thumbs up me too

[+] Ask your own question...

How do I sync the calendar with my iPhone?

Flag this question as inappropriate. 76 users have this question.

**Answer #1:**  
To select which calendars to sync to your Apple device, follow these steps: Open the Safari browser on your device and go to <http://m.google.com> Sign in with your account and select your device from the list of devices you've set up for Google Sync. Bookmark this page so you can return to it easily.

Helpful

[+] Add an answer...

# PARMIT DEMOS TO FACEBOOK (2011)



# UW'S COMOTION ENCOURAGES US (2011)



# WE DELIBERATE (2012)



Do I really want  
to spend my  
whole sabbatical  
on this?

Do I really want  
to moonlight for  
a year?

Do I really  
want to quit  
my Ph.D.?

# WE LEAP (2012)



# WE FUNDRAISE (2013)



# WE DESIGN, BUILD, SELL (2013-PRESENT)

ESPAÑOL | PROFILE | TOOLS | LOG OUT

T-Mobile \$ BILLING USAGE PLAN PHONE SHOP SEARCH GO

Bill details : Oct. 16 Sep. 17 - Oct. 16, 2015

Back to summary

About account charges Account

Service prior to Oct 17 Compare to last month

OTHER CHARGES AND CREDITS

Zeroed Int - Emp	(\$238.16)
Subtotal:	(\$238.16)

Changes \$0.00

There were no account level changes.

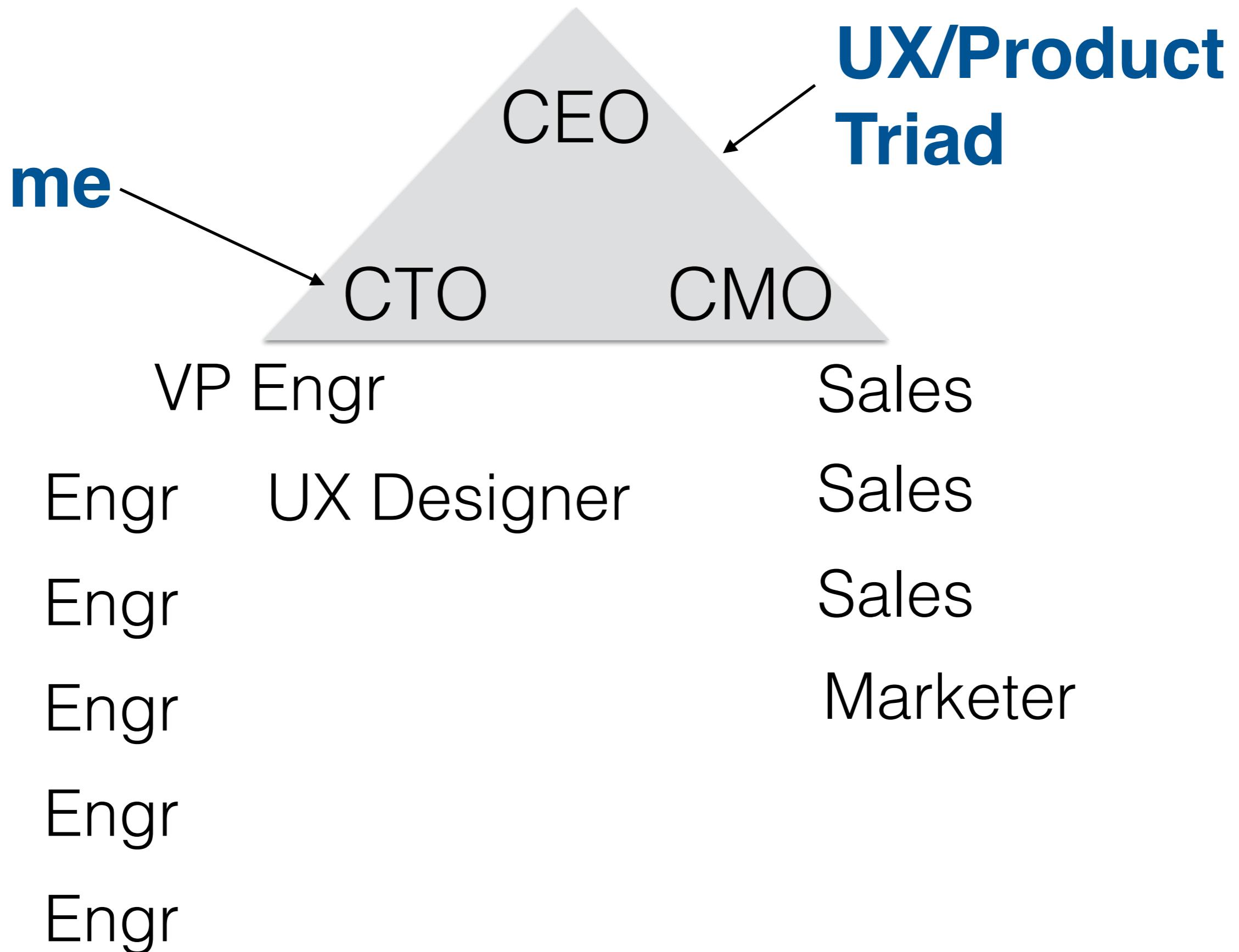
Service from Oct 17 to Nov 16

PLAN

SimpleChoice Val FAM UnlTT+D	\$60.00
Subtotal:	\$60.00

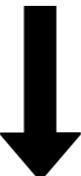
Questions about your Bill? 55

# THE ORG CHART (2015)



What was hard about  
achieving great UX  
through engineering?

# 100,000 word diary



Andrew J. Ko (2017). **A Three-Year Participant Observation of Software Startup Software Evolution**. International Conference on Software Engineering (ICSE), Software Engineering in Practice, to appear.

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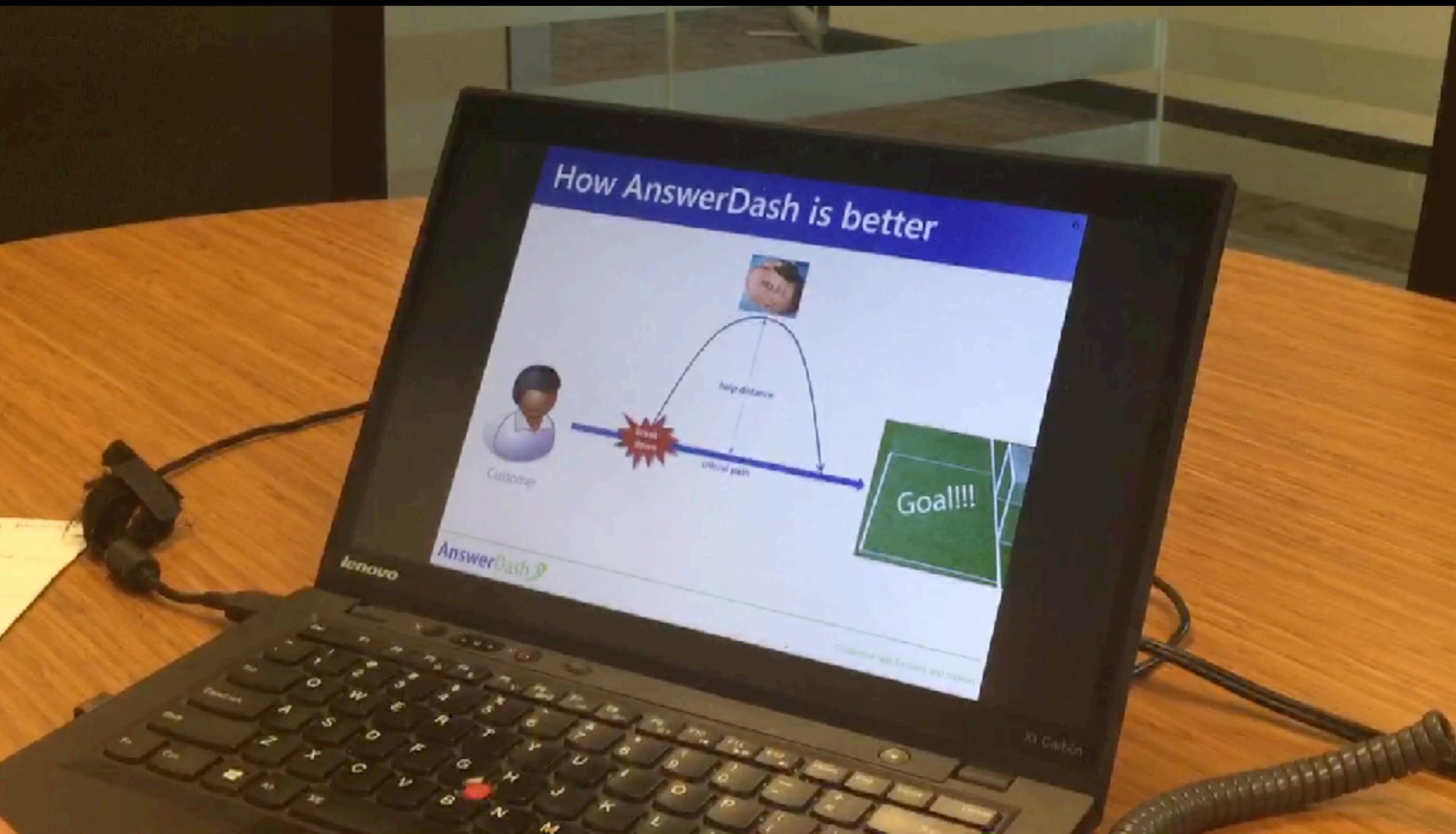
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**THESIS:** Successful products require the constant, collective communication and agreement of a coherent proposition of a product's value across UX, design, engineering, product, marketing, sales, support, and even customers.

**This is not a design problem or an engineering problem. It's communication problem.**

Here are seven ways  
this is true.

# DIFFUSION OF POWER IMPEDES COLLECTIVE AGREEMENT OF VALUE



# INCONSISTENT UNDERSTANDING OF VALUE → INCOHERENT EXPRESSION OF VALUE



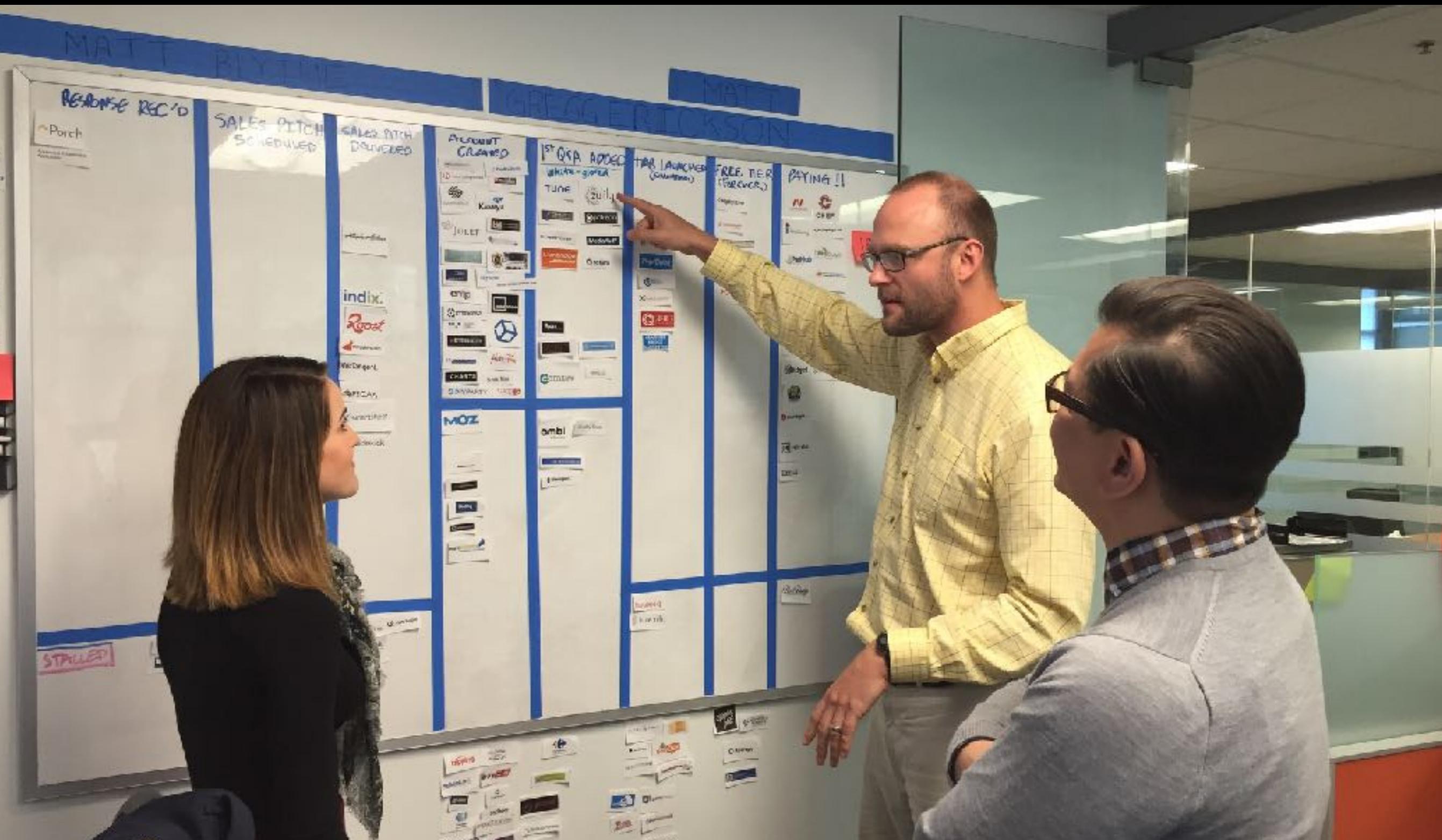
# PROSOCIAL COMMUNICATION STREAMLINES DISSEMINATION OF VALUE



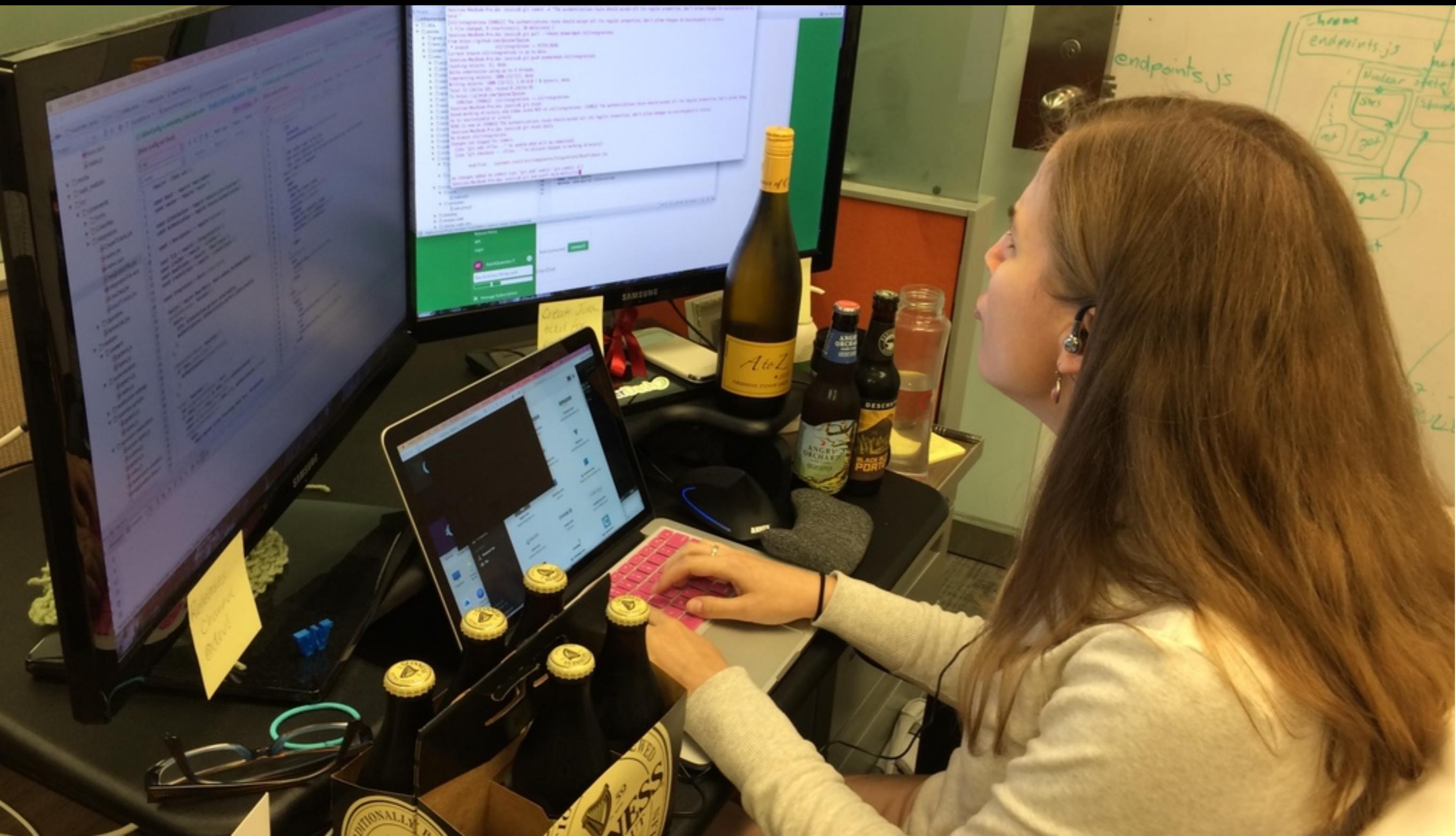
# DISTRUST IMPEDES EXPRESSION OF VALUE ACROSS DISCIPLINES



# SOCIAL DECISION FATIGUE LIMITS CONSENSUS ON VALUE



# VALUE IS QUICKLY LOST IN TRANSLATION TO CODE



# SCHEMAS STRUCTURE EVERYONE'S WORK

```
    `linkStyle` text,
    `frameSize` int(11) DEFAULT '10',
    `baseSmartphonePointSize` int(11) NOT NULL DEFAULT '16',
    `textFieldStyle` text,
    `modelessMinOpacity` int(11) DEFAULT NULL,
    `modelessMinScale` int(11) DEFAULT NULL,
    `modelessDwellTime` int(11) DEFAULT NULL,
    `modelessColor` text,
    `modelessSize` int(11) DEFAULT NULL,
    `qa_button_text` text NOT NULL,
    `qa_button_hover_text` text NOT NULL,
    `question_label` text NOT NULL,
    `answer_label` text NOT NULL,
    `objective` text NOT NULL,
    `search_prompt` text NOT NULL,
    `question_submitted` text NOT NULL,
    `submit_new_question_label` text NOT NULL,
    `new_answer_prompt` text NOT NULL,
    `popup_objective` text NOT NULL,
    `questionstoshow` int(11) NOT NULL DEFAULT '5',
    `q_label` text,
    `a_label` text,
    `question_prompt` text,
    `email_prompt` text,
    PRIMARY KEY (`styleid`)
) ENGINE=InnoDB AUTO_INCREMENT=1 DEFAULT CHARSET=utf16;
/*!40101 SET character_set_client = @saved_cs_client */;

-- 
-- Table structure for table `targets`
-- 

DROP TABLE IF EXISTS `targets`;
/*!40101 SET @saved_cs_client      = @@character_set_client */;
/*!40101 SET character_set_client = utf8 */;
CREATE TABLE `targets` (
```

Q Why aren't all of these cool inventions and discoveries used in practice?

A There are *literally* a million decisions between a research prototype and a product...

... and if those decisions are not made with the **constant, collective communication and agreement of a coherent proposition** of a product's value across UX, design, engineering, product, marketing, sales, support, and customers

... it will fail.

... and if those decisions are not made with the **constant, collective communication and agreement** of a **coherent proposition** of a product's value across ~~UX~~, design, engineering, product, marketing, sales, support, and customers

**Subject to further study**

... it will fail.

# Questions to ponder...

- Does everyone on your team have the same product value proposition in their head?
- How do you ensure they do?
- Is everyone on your team making decisions consistent with this understanding?
- When your value proposition changes, how do you communicate the change to everyone?
- Who owns your teams value proposition?
- Are they open to reconsidering the proposition in light of new evidence?

# UX + Engineering

- Which of you owns the value proposition?
- Engineering: are you making decisions based on value or based on architectural concerns?
- UX: are you making decisions based on value or interface concerns?
- Is it your job to build consensus on value or is that the job of sales and marketing?

My academic colleagues  
and I will keep studying this.

We'll also start teaching it.

Before we start, what are  
*your* thoughts on it?

Thanks!