

Intersection of Data Science and Design



Jacqueline Nolis @skyetetra · Aug 28, 2018

The most underrated algorithm in data science is “go talk to people who deal with the problem every day and learn from them.”

Modeling customer churn? Talk to people working at the store

Optimizing a website? Talk to users

Looking at just tables of data is so limiting!

141

3K

9.5K



The resulting debate reflected the state of the relationship between data science and design:

The resulting debate reflected the state of the relationship between data science and design:

They're not on the same page.

Data scientists overlook the value of design, and designers don't get what's possible with data and machine learning.

	Data scientists	Designers
Neglect	The people their algorithms affect	The data science that shapes the experience
How	<ul style="list-style-type: none">Ignore evidence that they're not comfortable with but that's key for delivering great CXOveremphasize "business understanding" at the expense of customer understandingTrivialize the value of good design — or don't get it at all	<ul style="list-style-type: none">Struggle to understand what happens inside the algorithm "box"Don't know how to use ML algorithms as a design materialDon't seek out data scientists' valuable expertise

Machine Learning Algorithms Are The New Material Of Design

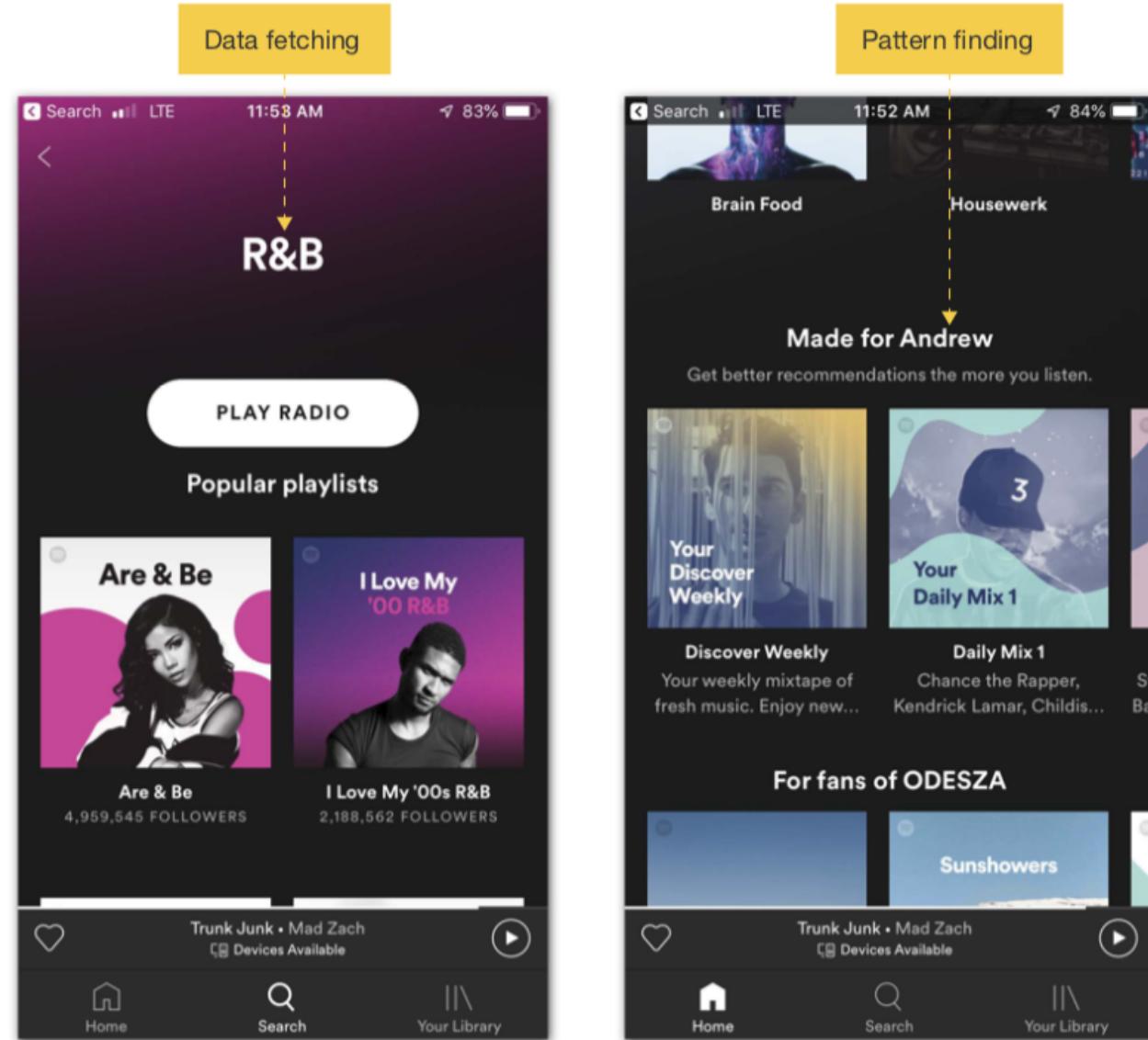
data-fueled product

a digital product that recognizes patterns and anomalies relevant to a user's goals in large quantities of data and adjusts parts of its user interface in response.

**Data-fetching algorithms
(deterministic, rules-based)**

**Pattern-finding algorithms
(probabilistic, based on machine learning)**

Songs in a particular genre	The next song you're likely to enjoy
Doctors in a geographical area	Best-fit doctors based on your symptoms
Performance of an email marketing campaign	Audience attributes to target with your marketing technology platform
History of customer support incidents	Relevant knowledge base articles for a service rep on a support call
Customer feedback messages received in last 30 days	The most probable operational problems with your eCommerce system and processes based on customer feedback and operational data
The list of employees at an organization	Employees who can probably help with a specific project based on their availability and success on similar projects



Source: Spotify mobile app

SOCIAL MEDIA SCANDAL

Pinterest emailed suicide tips after Molly Russell's death

FaceApp forced to pull 'racist' filters that allow 'digital blackface'

AI-powered program allowed users to edit selfies to fit into 'Caucasian, Asian, Indian or Black' categories causing outrage and immediate U-turn

Amazon reportedly scraps internal AI recruiting tool that was biased against women

The secret program penalized applications that contained the word "women's"

Google 'fixed' its racist algorithm by removing gorillas from its image-labeling tech

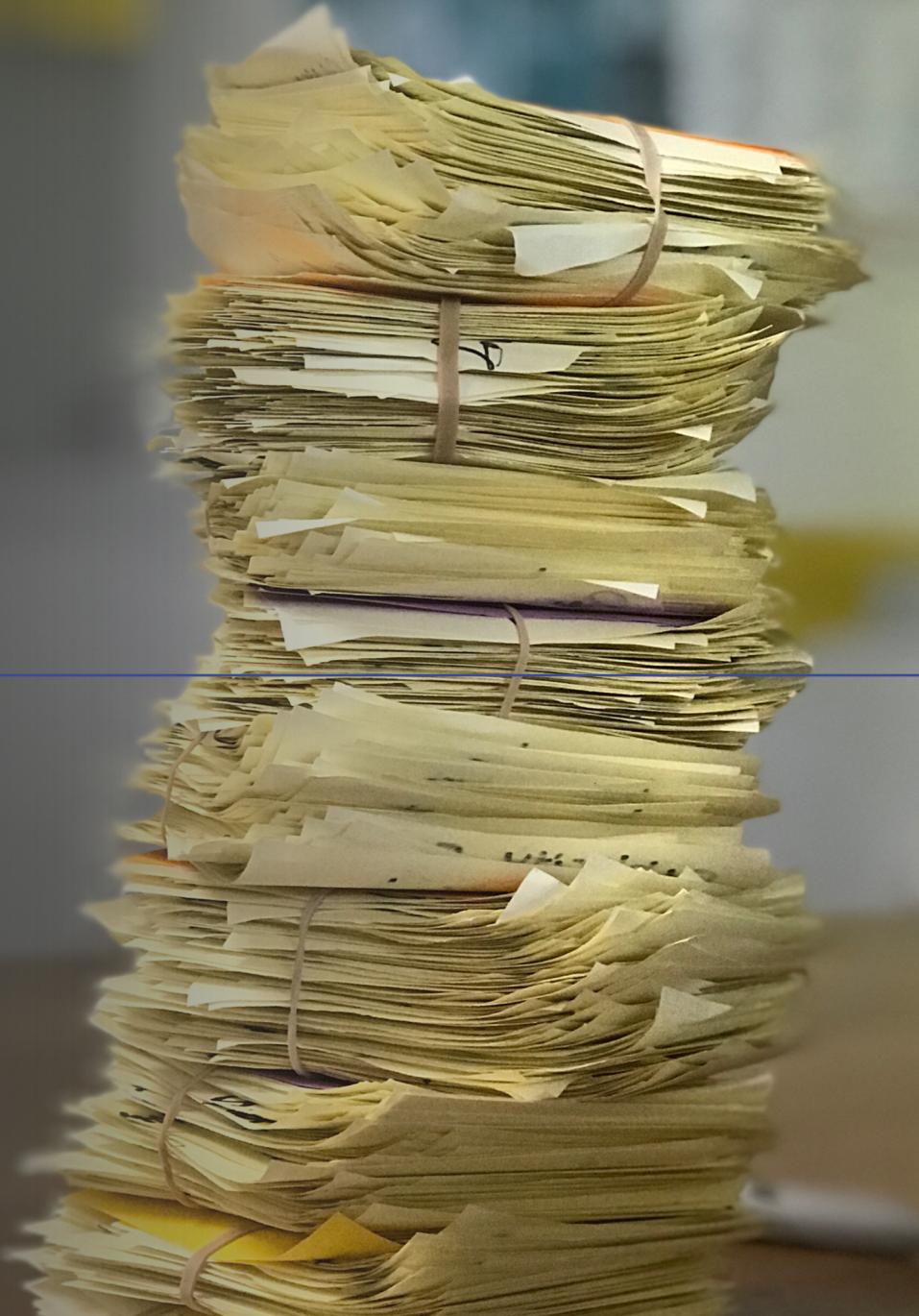
Nearly three years after the company was called out, it hasn't gone beyond a quick workaround

Facebook's ad-serving algorithm discriminates by gender and race

Even if an advertiser is well-intentioned, the algorithm still prefers certain groups of people over others.

Many companies' misuse of machine learning can cause negative and harmful experiences.

**It was never
about the
sticky notes.**

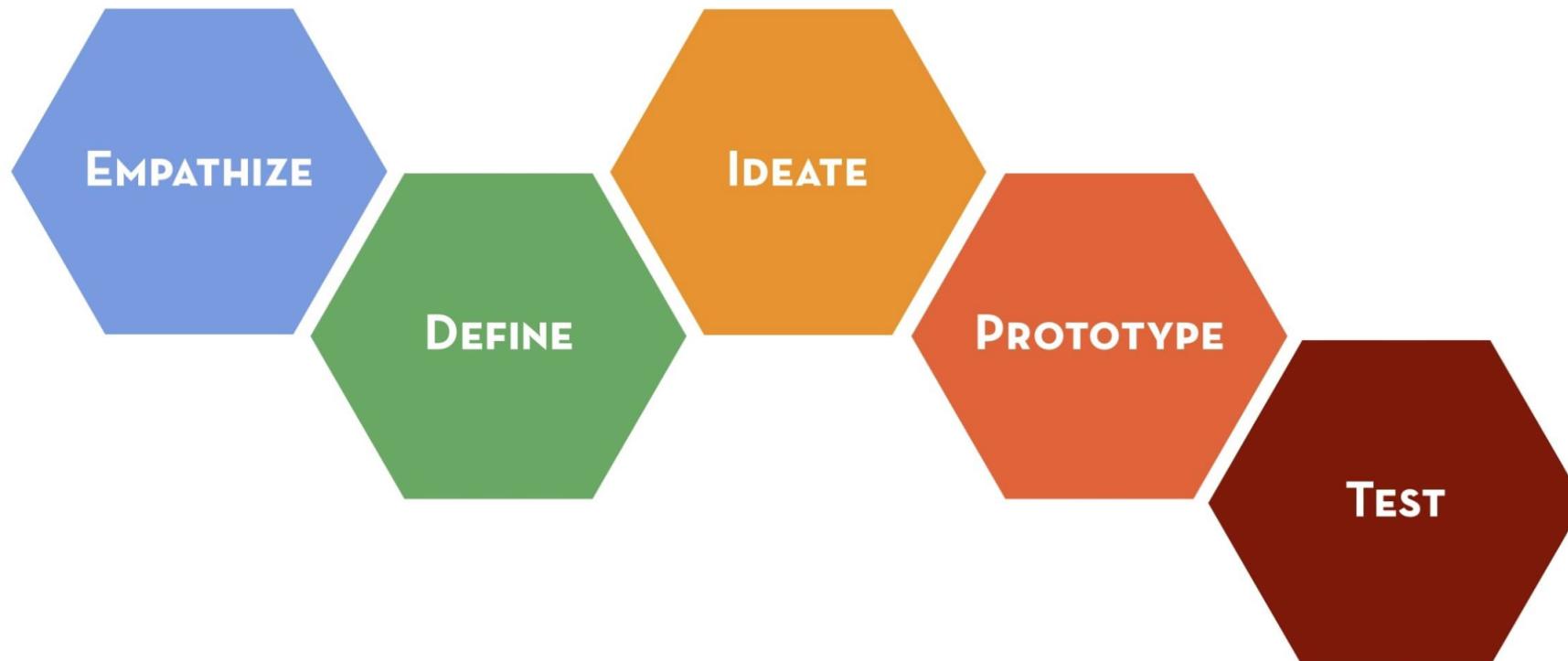


design-thinking

Method for innovative problem-solving. Outlines an iterative process. “Design’s cousin discipline for the masses.”

design-thinking

Method for innovative problem-solving. Outlines an iterative process. “Design’s cousin discipline for the masses.”



design-thinking

Method for innovative problem-solving, Outlines an iterative process. “Design’s cousin discipline for the masses.”

user-centered design

Mindset that focuses on how users interact with a designated product or service; already know at the beginning you’re building an app, website, service, etc.

human-centered design

Mindset that focuses on understanding human needs and then solving problems; doesn’t know the end-product yet, solution is to be defined by the needs.



Jacqueline Nolis @skyetetra · Aug 28, 2018

The most underrated algorithm in data science is “go talk to people who deal with the problem every day and learn from them.”

Modeling customer churn? Talk to people working at the store

Optimizing a website? Talk to users

Looking at just tables of data is so limiting!

141

3K

9.5K



Reframe

**Stop thinking about data scientists as
“that nerdy guy or girl behind the scenes.”**

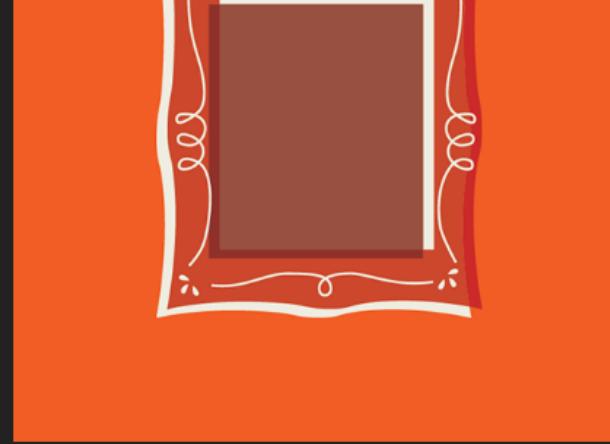
- Ovetta Sampson, design research lead at IDEO

Reframe

**Stop thinking about data scientists as
“that nerdy guy or girl behind the scenes.”**

**Think about them as designers who
happen to use data to craft experiences.**

- Ovetta Sampson, design research lead at IDEO



RECRUITING TOOLS



Design Kit by IDEO

HOW DO I CONDUCT AN
INTERVIEW?

INTERVIEW

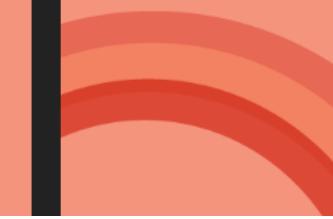
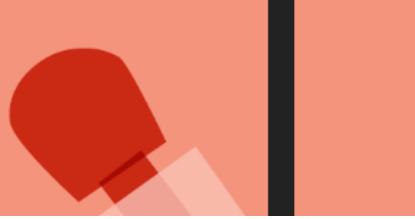


GROUP INTERVIEW

CONVERSATION STARTERS

ANALOGOUS INSPIRATION

EXPERT INTERVIEW



Solutions from the Forrester Report

1. Educate, staff, and operate design teams differently.

- Get the design team up to speed about data science.
- Battle groupthink — assemble teams that include multiple perspectives.
- Help non-designer colleagues proactively, not just reactively.
- Encourage whistleblowing by the whole team.
- Find and fix problems aggressively.

2. Adapt design methods to machine learning algorithms.

- Research users' mindsets and mental models about algorithms.
- Ensure designers understand the inputs and outputs of the model.
- Test whether users will tolerate a product that can't explain its outputs.
- Connect the data science and design worlds with structured sketching.
- Prototype as much and as early as you can.
- Test prototypes using fake data.

3. Use the cost of making a mistake as a guide for design.

- Design assistive products when the cost of a mistake would be high.
- Design agentive products when costs are low.
- Let people ask "why?"
- Provide just enough explanation — but no more.
- Ask users for on-the-spot feedback about what they see.
- Ensure consistency.

Sources Consulted

- Forrester Report: [Data-Fueled Products: How To Thrive On The Design And Data Science Collision](#)
- Forrester Article: [Data Scientists Aren't Just About The Numbers — And Other Lessons From IDEO About The Collision Between Design And Data Science](#)
- Harvard Business Review: [What Happens When Data Scientists and Designers Work Together](#)
- Towards Data Science Article: [A Design Thinking Mindset for Data Science](#)

Suggested Resources

- [Forrester Reports](#) – To access, use this link and sign up for account in Forrester. Use your SMU email address as your business email
- [Design Kit](#) – “What is human-centered design?” video & Design Kit methods page