



# Data science and behavioral design

*implications for retirement security*

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May 3, 2018

# The silent crisis

*This silent crisis, if not solved, will slow growth, challenge budgets, and hurt households across the United States.*

*— Michael Bloomberg*

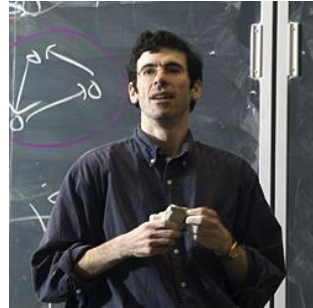


# Two overdue sciences

## Big data

*The term itself is vague, but it is getting at something that is real... Big Data is a tagline for a process that has the potential to transform everything.*

— Jon Kleinberg, Cornell University

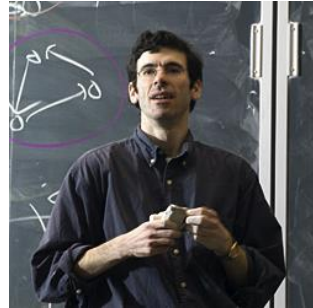


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## Choice architecture

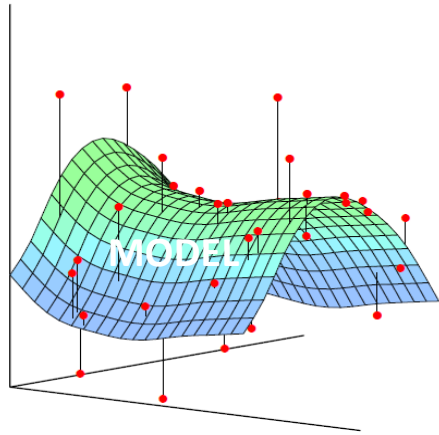
*Many programmes and services are designed not for the brains of humans but of Vulcans. Thanks in large part to Kahneman and his many collaborators pupils and acolytes, this can and will change.*

— Rory Sutherland, Ogilvy Mather



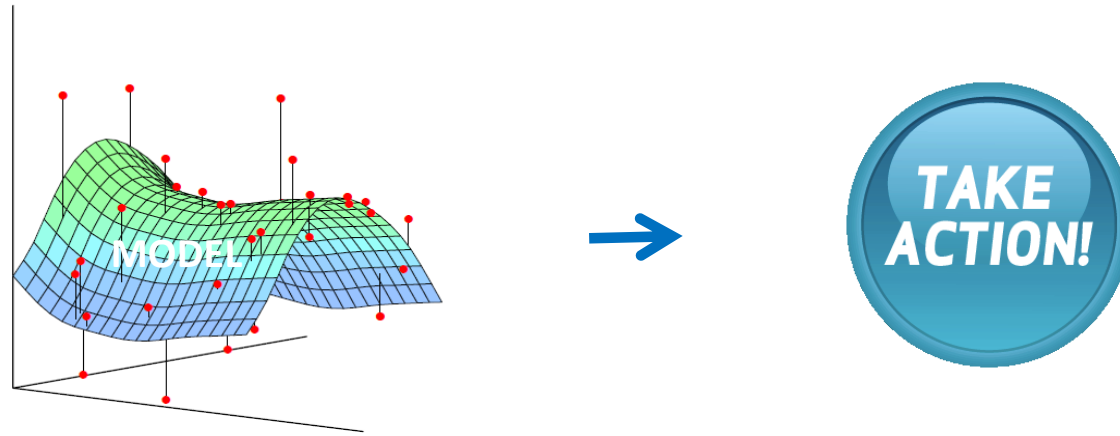
# The “last mile problem” of data science

*Algorithms can point us in the right direction, but are not a complete solution.*



# Towards “greater data science”

*Algorithms can point us in the right direction, but are not a complete solution.*



*They must be followed by the right judgments, decisions, or behavior change.*



# Example: keeping ourselves honest

## Data science

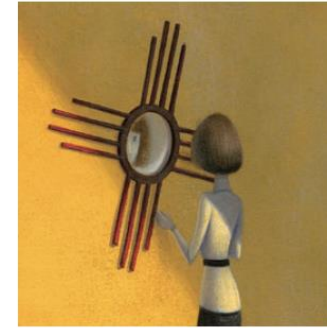
Algorithms can identify cases relatively likely to be collecting benefits improperly.

(Problem: false positives!)

## Behavioral science

Use nudge messages to prompt accurate disclosure of income.

(A/B test messages in online environment)



## Nudging New Mexico

Kindling honesty  
among unemployment  
claimants

BY JOY FOREHAND AND MICHAEL GREENE

**DAN ARIELY** THE(HONEST) TRUTH ABOUT DISHONESTY



# Customer-centricity

*We've become a truly customer-centric company...*

*We need to understand how our customers think, what their needs are, and make sure we understand it from their perspective.*

*— CEO of household-name life insurer*

Brand  
Centric



Customer  
Centric





# How Econs think

*Economists assume that the people they study, so called homo economicus, or what I call Econs, are really smart. They know as much economics as the best economist. They make perfect forecasts, have no self-control problems and are complete jerks. They'll steal your money if they can and get away with it.*

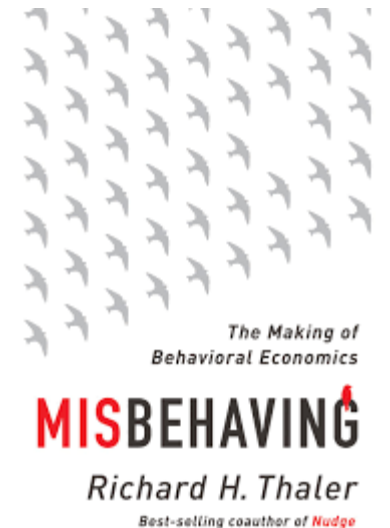
— Richard Thaler



# How Humans think

*Most of the people I meet don't have any of those qualities.  
They have trouble balancing their checkbook without a spreadsheet.  
They eat too much and save too little...  
They'll leave a tip at a restaurant even if they don't plan to go back.*

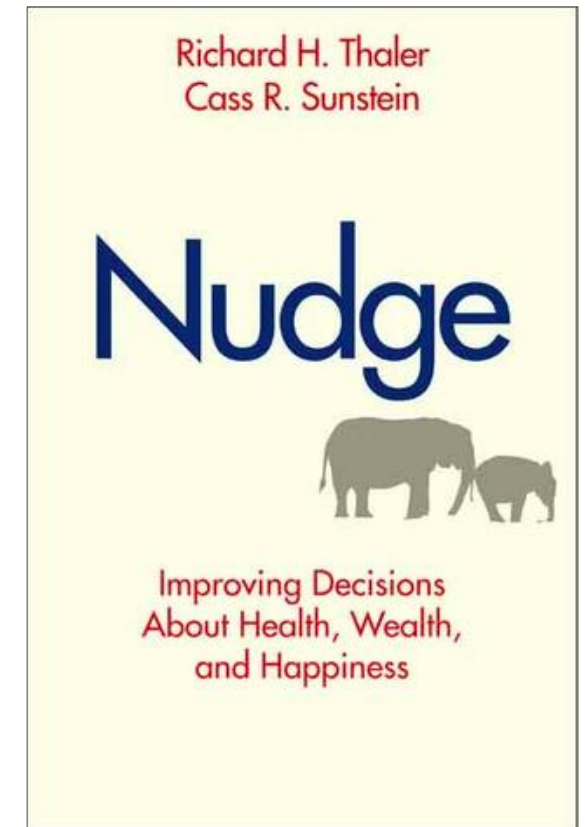
— Richard Thaler



# The need for customer-centricity in personal finance

*Retirement savings decisions are “fraught choices”*

- *Made infrequently*
- *Provide no feedback*
- *Require expert knowledge*
- *Effects experienced only by one’s “future self”*

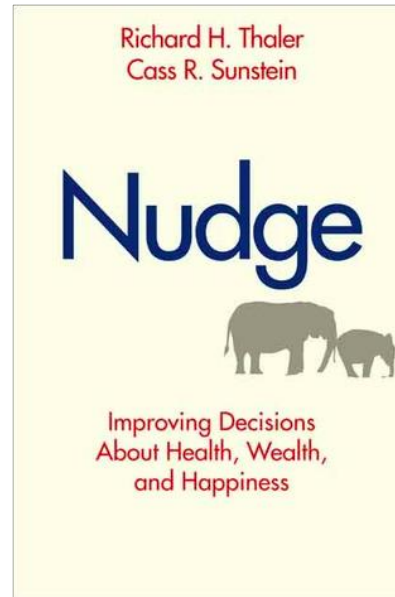
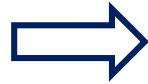




# Nudge is human-centered design



DESIGN  
EVERYDAY  
THINGS



## Design considerations

- *Present bias*
- *Loss aversion*
- *Social proof*
- *“Social Physics”*
- *Framing effects*
- *Intuitive language / infoVis*
- *Status quo bias*
- *Mental accounting*
- *Cognitive load / “Scarcity”*
- *Pre-commitment*
- *Lotteries*  
*(overweighing small probabilities)*
- *Unit bias (“mindless eating”)*
- *Removing bottlenecks*

“While Cass and I were capable of recognizing good nudges when we came across them, we were still missing an organizing principle for how to devise effective nudges.

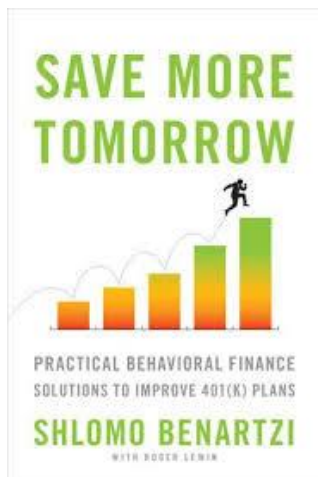
We had a breakthrough... when I reread Don Norman’s classic book *The Design of Everyday Things*.”

– Richard Thaler, *Misbehaving*

# Smart defaults

*“Save more tomorrow”: improve people’s retirement prospects by:*

- *using smart defaults*
- *leveraging inertia and status quo bias*



Log In

MarketWatch

LATEST NEWS

10:12 A.M. Anthony Bourdain on why w  
ET level of food waste  
10:11 A.M. Treasury sees modest bu

NEWS VIEWER MARKETS INVESTING PERSONAL FINANCE RETIREMENT ECONOMY REAL

Home > Retirement

## Nobel Prize winner Richard Thaler may have added \$29.6 billion to retirement accounts

Published: Oct 10, 2017 10:01 a.m. ET

A lot has been done for retirement saving but more is needed

A portrait of Richard Thaler, a middle-aged man with white hair, wearing a blue shirt and a grey jacket. He is smiling slightly and looking towards the camera. The background is dark.

Getty Images

Richard Thaler, a professor of behavioral science and economics at the University of Chicago Booth School of Business, was named the recipient of the Nobel Prize in economics.

Richard Thaler, the recent recipient of the Nobel Prize in economics, has helped retirement savers substantially in the past decade — to the tune of about \$29.6 billion, perhaps, according to fellow researcher Shlomo Benartzi.

# Social proof to nudge financial health

*HelloWallet uses behavioral design to prompt workers to make smarter financial decisions.*

**Data:** Customer transactions  
**Digital:** Medium of customer interaction  
**Design:** Optimize peer comparison messages



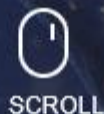
[About the Wellness Score](#)





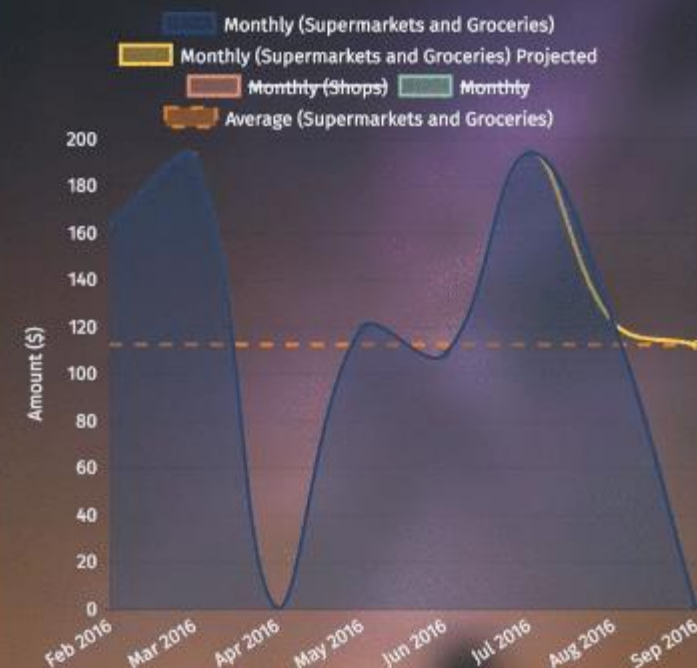
Building the most intelligent technology to enhance human capabilities

WATCH OUR STORY



It's been awhile since I've gone grocery shopping how much money can I spend

Based on your spending habits, you have  
\$112.74 left in your monthly budget to  
spend on Supermarkets and Groceries.  
This would reduce your balance to  
\$15455.61.



Tap to speak

# Beyond “Siri for you bank account”

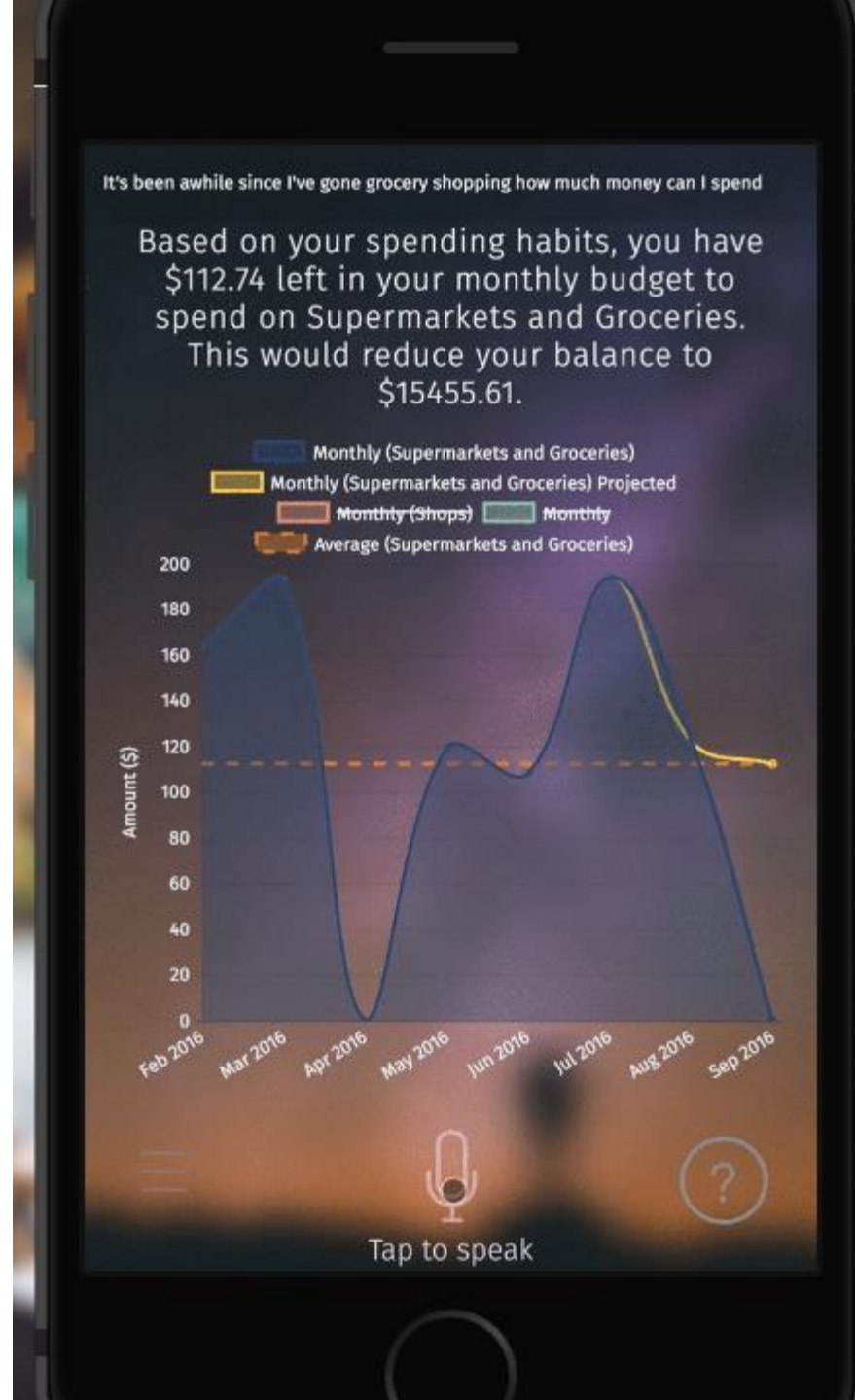
Digital AI apps are facilitators, not drivers of behavior change

(c.f. Patel/Asch/Volpp on wearables and health behavior change)

*Choice architecture is needed to fulfill the promise of “human-centered AI”*

## Behavioral design ideas

- Peer comparisons
- Just in time reminders
- A/B tested messaging
- Intuitive language and infoViz
- Articulating clear steps
- Commitment devices
- Smart defaults
- Mental accounting
- Habit formation





# Nudge 2.0: Digital engagement

*Acorns: make it as easy to save money as “one click” apps enable us to spend it.*

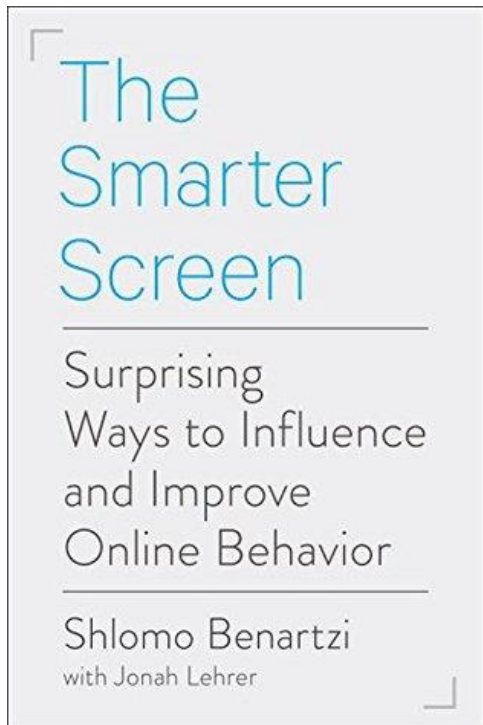
*Automatically tie small deposits to purchase decisions.*

*Messages prompt customers to make larger recurring investments.*



# Nudge 2.0: “The Smarter Screen”

*Data visualization can help people understand the long-term impacts of different investment decisions.*

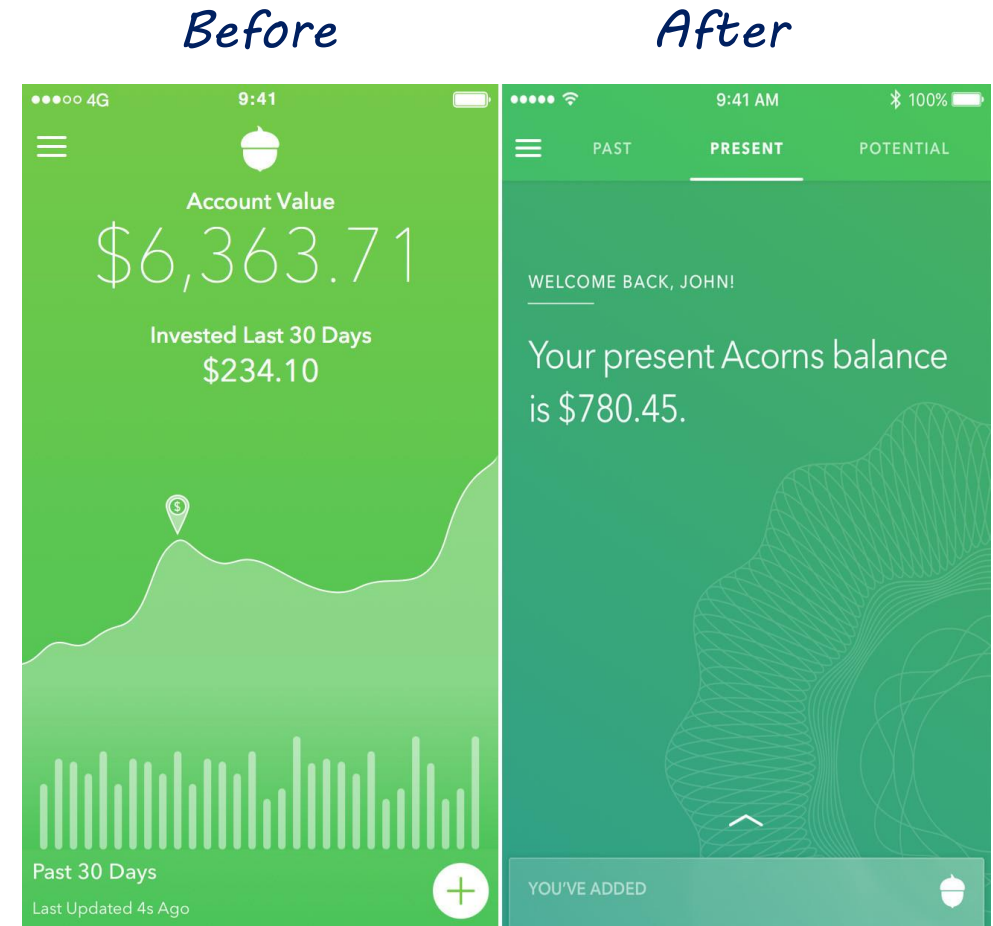


# Nudge 2.0: Rapid A/B testing

*Rapid A/B testing to learn what works.*

## Examples

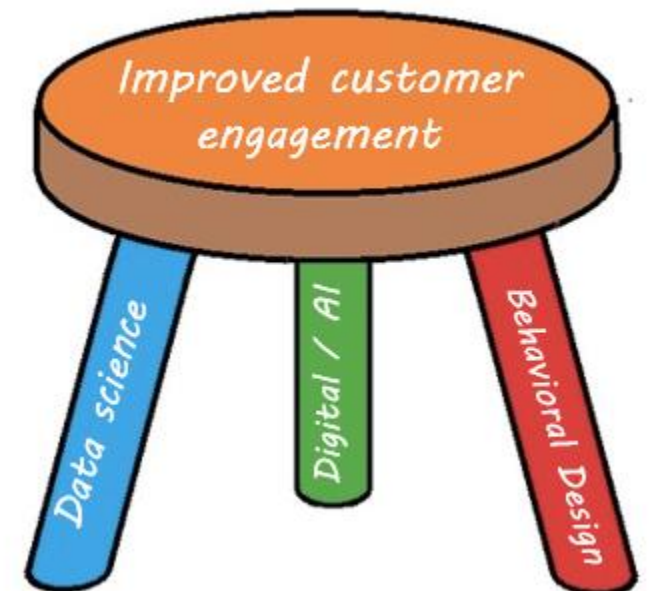
1. Avoid displaying information that prompts short-term thinking
2. Using data to personalize messages/nudges
3. Which option yields higher uptake?
  1. Save \$5 / day
  2. Save \$35 / week
  3. Save \$150 / month



# Towards “Nudge 2.0”: Data + Digital + Design

*Big data and AI/digital tech enable us to take “Nudge” to the next level*

- **Big data:** enables “behavioral phenotyping” for personalized interventions
  - Analogous to precision medicine
  - Content: specifics of one’s financial position / goals reflected in the intervention
  - Form: different types of nudges might work for different people
- **Digital AI apps:** enables us to
  - Gather “digital breadcrumbs”
  - Deliver “digital nudges”
  - “Just in time”
  - Rapid A/B testing at scale
  - PET: Personalized, Easy, Timely





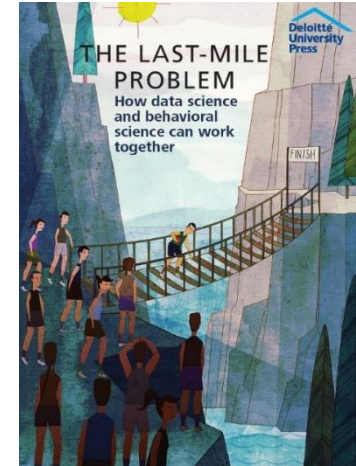
# Copies available in the lobby

For more discussion see:

“The personalized and the personal: Socially responsible innovation through big data”

*Deloitte Review*, January 2014

<https://www2.deloitte.com/insights/us/en/deloitte-review/issue-14/dr14-personalized-and-personal.html>



“The Last Mile Problem: how data science and behavioral science can work together”

*Deloitte Review*, January 2015

<http://dupress.com/articles/behavioral-economics-predictive-analytics/>



“The Importance of Misbehaving: a conversation with Richard Thaler”

*Deloitte Review*, January 2016

<https://dupress.deloitte.com/dup-us-en/deloitte-review/issue-18/behavioral-economics-richard-thaler-interview.html>

“Cognitive collaboration: why humans and computers think better together”

*Deloitte Review*, January 2017

<https://dupress.deloitte.com/dup-us-en/deloitte-review/issue-20/augmented-intelligence-human-computer-collaboration.html>



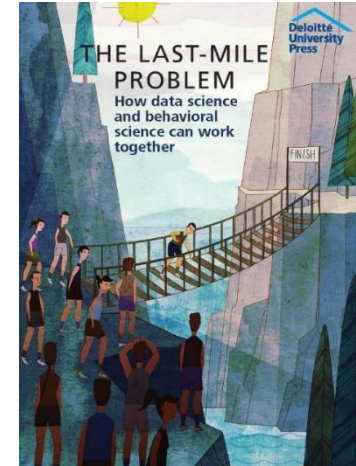
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# James Guszcza – US Chief Data Scientist, Deloitte Consulting



James Guszcza is Deloitte Consulting's Chief Data Scientist, and a pioneering member of Deloitte's original Data Science practice.

Jim has applied statistical and machine learning methods to such diverse business problems as healthcare utilization, customer and employee retention, talent management, customer segmentation, insurance pricing and underwriting, credit scoring, child support enforcement, patient safety, claims management, and fraud detection.

He has also spearheaded Deloitte's use of behavioral nudge tactics to more effectively act on model indications.

A frequent author and conference speaker, Jim designed and teaches hands-on business analytics training seminars for both the Casualty Actuarial Society and the Society of Actuaries.

Jim is a former professor at the University of Wisconsin-Madison business school, and he holds a PhD in the Philosophy of Science from The University of Chicago. Jim is a Fellow of the Casualty Actuarial Society, and on its board of directors.

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