

# Robo Advice: Digital Disruption

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*When was the last time you spoke to a travel agent?*

Air fare commissions are airlines' third-biggest expense, behind labor and fuel.

*1994, New York Times*

United Airlines plans to cut travel-agent commissions for the second time in two years... "We're disgusted," said a spokesman for the American Society of Travel Agents.

*1997, Wall Street Journal*

Following Delta's lead, several major U.S. airlines this month eliminated most commissions paid to travel agents for domestic tickets.

*2002, Los Angeles Times*

Mortgage brokers?	—————→	Direct to customer
Call Center Representatives?	—————→	Virtual chat bots/Self-service
Real Estate Agents?	—————→	Online home finding/buying
Financial Planners?	—————→	Robo advisors

**Citigroup Study Report Suggests 30% Job Cuts In US Banking Industry By 2025**

Oxford researchers say that 45% of America's occupations will be automated within the next 20 years

Everyone talks about how Robo Advisors can't connect with clients. I actually believe those kinds of tools are like an ATM machine. We are all going to have it.

*– Larry Fink, Blackrock, August 2015*

Blackrock buys a robo advisor, August 26, 2015

Fidelity Investments Starts National Pilot of Its Robo Service, March 29, 2016

# FinTech is Forcing Banking to a Tipping Point

Investment in financial technology has grown from \$1.8 billion in 2010 to \$19 billion in 2015

70% of this investment is focused on the "last mile" of user experience

FinTech companies will soon have more customers than major banks (China already there)

WeChat (text messaging service) created WeBank

Alibaba invested in MYbank

Baidu and Citic Bank joint venture

Human model  
Laggards  
Client Service  
100 year old model  
FICO + Debt  
Banks



Internet model ← Fewer employees manage larger revenues  
 Innovative ← 8 minute approval, paperless mortgage, mobile app  
 Self Service ← Virtual chat bots (Microsoft Build 2016 announcement)  
 New model ← peer to peer, lower reliance on traditional loan criteria  
 Machine learning ← Millennials don't carry credit cards (low FICOs)  
 Internet giants ← What happens if Amazon decides to offer mortgages? ←

"Silicon Valley is coming. There are hundreds of startups with a lot of brains and money working on various alternatives to traditional banking." - Jamie Dimon

## Bankings "Uber" Moment

Value is shifting from physical assets (e.g. branches) to connectivity  
 Future is about focusing on advisory/consultation versus transactions  
 Smartphones a game changer for finance and making payments

"We'll probably be the last generation to use the term credit card and debit card. It will probably be debit access and credit access and it will be likely loaded on to a mobile device." - Wells Fargo CEO

## Blockchain

Cashless payment clearing protocol  
 Institutions will no longer keep ledgers (share one ledger)  
 Distributed ledger, held on many computers, hard to hack  
 Transaction history cannot be modified (audits obsolete)  
 Payment processing will be instantaneous and little to no cost  
 Other uses: no more title insurance, house on the blockchain  
 no escrow account, blockchain proves authenticity  
 instant income/debt verification, buyer has digital id

Internet of communication ← Encryption  
 Internet of information ← Websites  
 Internet of value  
 Internet of data ← Artificial intelligence (machine learning)  
 Internet of things ← Sensors

While blockchain will make transaction seamless,  
 Machine learning calculates risk of doing a transaction

"Silicon Valley is good at getting rid of pain points. Banks are good at creating them." - Jamie Dimon

# Robo Advice

Leverage client information + algorithms to develop automated, personalized, financial recommendations  
Robo advice is custom tailored to each customer and changes with time as the customer changes  
One technology application can service thousands of customers, reducing the need for face-to-face interactions  
Robo advice has mass appeal, attracting younger customers and those who cannot afford full service advice  
Within 5-10 years, Financial Advisors will become next travel agents, no longer necessary, outperformed by computer  
Every major bank is investing in robo advice, with some (Schwab and Vanguard) already seeing success  
Robo advisors do not hold your hand in times of stress, but instead anticipate and minimize stress before it happens  
Robo advisors ask 50+ questions, use machine learning and correlate product offerings to each customer

## Today

Give a better rate for more money down  
Give better rate for longer term  
Give a better rate for prime FICO scores

## Tomorrow

Give a better rate for house appreciation potential  
Give a better rate for a low (e.g.) loan-to-income ratio  
Give a better rate for a STEM college degree

Grade every home for sale, not based on size/price, but potential to appreciate  
Then encourage prospects to investigate these Grade A homes, with promises of better loan terms  
Help prospects find the best home for money and incent to leave cushion for possible, future income shocks

## From transactional...

Pre-approval  
Fill out application and wait  
Penalize based on outdated indicators

## ...to consultative

Help the prospect find the best value home  
Approval conditions set in advance (meet them and approved)  
Better terms for purchasing something more affordable

*So far, no human involvement... homes are graded by computer, application offers guidance on how much to spend  
Someday, the same algorithms will coach a prospect on how much to (initially) offer the seller for the home*

Counterintuitive, but buyer is offered better terms for buying smaller house, which equals lower risk of default & lower cost to service loan  
We are going to see real estate companies and mortgage companies merge into a consultative, end-to-end, business

# Technology at Work

## Probability of being computerized

Telemarketers	99%
Insurance Underwriters	99%
Loan Officers	98%
Bank Tellers	98%
Real Estate Brokers	97%
Account Collectors	95%
Accountants & Auditors	94%
Real Estate Appraisers	90%
<b>Real Estate Agents</b>	<b>86%</b>
Personal Financial Advisors	58%
Customer Service Reps	55%
Computer Programmers	48%

Oxford University, 2013

The three leading companies of Silicon Valley employed some **137,000 workers** in 2014 with a combined market capitalization of **\$1.09 trillion**. By contrast, in 1990 the three largest companies in Detroit had a market capitalization of **\$36 billion** while collectively employing about **1.2 million workers**.

*Oxford Martin Programme on Technology and Employment, 2015*

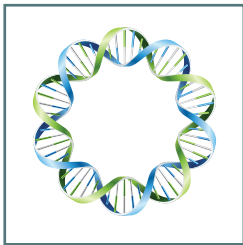
Operating income/employee at Google, ~6 times > IBM, ~12 times > General Motors  
 Industrial revolution benefited the worker, digital revolution benefits the consumer  
 Digital technologies reduce the need for both workers and capital  
 User intentions enable more intuitive customer service and robo advice platforms  
 Company that owns the "personal assistant" role will drive each consumer's decisions

*"Most of the knowledge in the world in the future is going to be extracted by machines and will reside in machines." - Director of AI Research, Facebook*

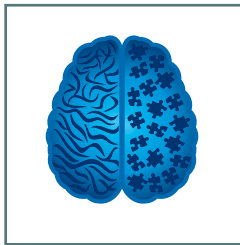
*"If we used all our technology resources, we could actually give people personalized recommendations for every step of their lives." - Former U.S. CTO*

## Data Powers the Robo Advisor

### Evolution



### Experience



Where does knowledge come from?

Evolution: knowledge that is encoded in your DNA

Experience: knowledge that is encoded in your neurons

Culture: knowledge that you acquire through interactions with world

**Computer: discovery of knowledge by machines**

*Machine learning can teach a computer to be a chess grand master in 72 hours  
 Computers will discover more than first three knowledge types put together*

→ *You should approve this loan applicant  
 You should hire this candidate  
 You should market refinance to this customer  
 You should intervene with this customer early*

### Culture



### Computers



*We have always relied on lagging indicators to manage our businesses  
 With the data revolution, we can use leading indicators to run our business*

**Data is the New Electricity**

*The 4th industrial revolution - steam, electricity, information and now data*



Microsoft CEO Satya Nadella, March 2016