Microsoft

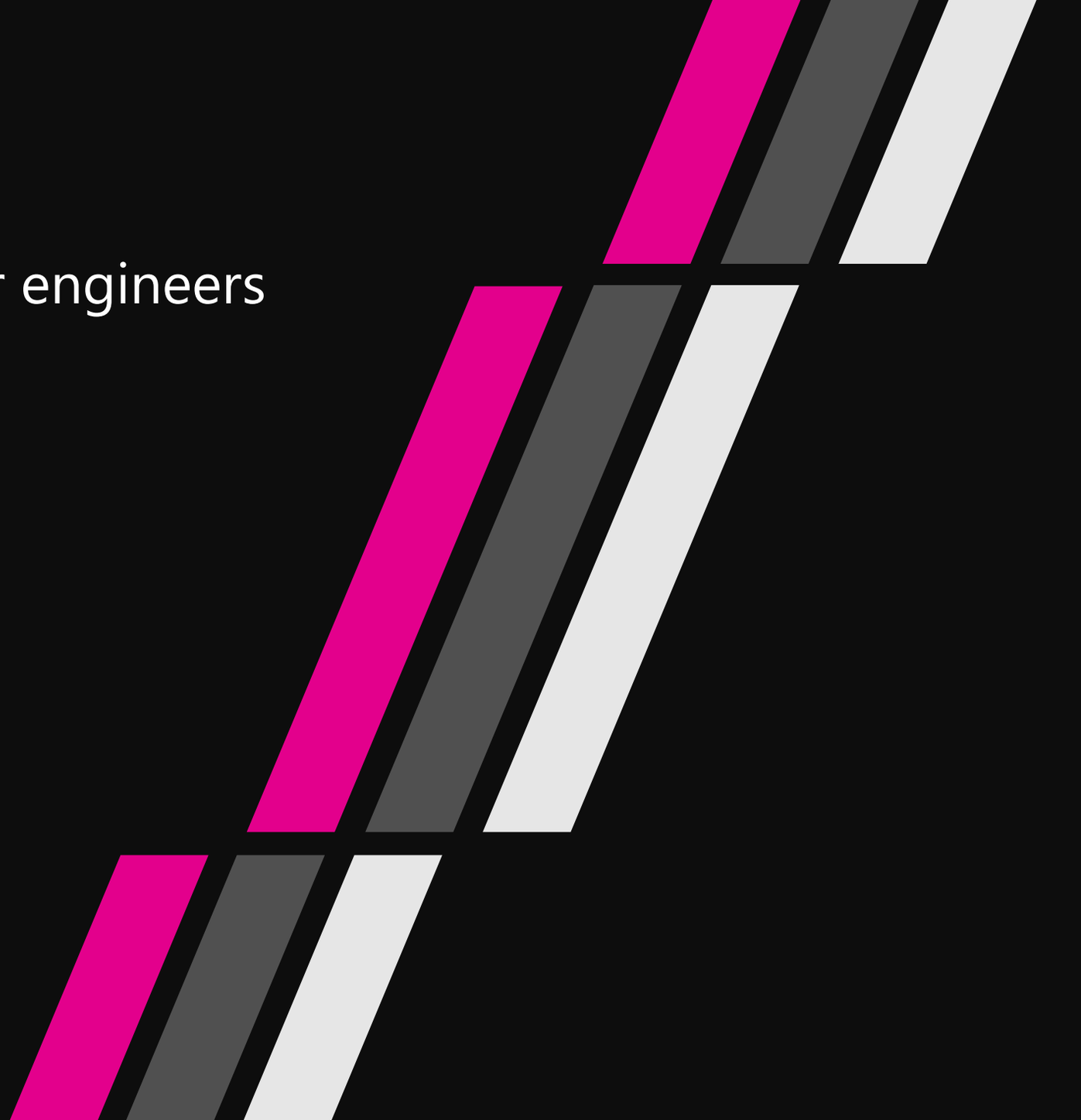
Do The Right Thing
Building Software in an Age of Social Responsibility

Jeffrey Snover
Microsoft Technical Fellow



Agenda

- Why we need to become better engineers
- What the issues are
- How do we move forward



Software eats the world

Eats traditional businesses

Bookstores	Amazon
Ads	Google
Music	iTunes, Spotify, Pandora
Telecom	Skype
Recruiting	LinkedIn
Financial	PayPal, Square

Eats the value chain

Car

Engine/safety control
Entertain passengers
Guidance
Connectivity (OnStar)

Defense

Satellite imagery
Smart weapons
Communications & logistics

Retailers

Logistics and distribution
Price optimization
Route optimization

Largest companies by market value in 2017

Ranking of the companies rank 1 to 100	Market value in billion U.S. dollars
Apple	752
Alphabet	579.5
Microsoft	507.5
Amazon.com	427
Berkshire Hathaway	409.9
Facebook	407.3
ExxonMobil	242.2
Johnson & Johnson	338.6
JPMorgan Chase	306.6
Tencent Holdings	277.1
Wells Fargo	274.4
Alibaba	264.9
General Electric	261.2

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Largest companies by market value in 2011

Ranking of the companies rank 1 to 100
JPMorgan Chase
HSBC Holdings
General Electric
Exxon Mobil
Royal Dutch Shell
PetroChina
ICBC
Berkshire Hathaway
Petrobras-Petroleo Brasil
Citigroup
BNP Paribas
Wells Fargo
Banco Santander

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Every company is a software company

"Silicon Valley is coming. We are going to work hard to make our services as seamless and competitive as theirs"

Jamie Dimon
JP Morgan CEO

J.P.Morgan

"We are putting 70% of our applications on the cloud to improve flexibility. And, we are launching game-changing applications to improve our efficiency"

Jeffrey Immelt
GE CEO

"Walmart is redefining the next generation of retail growth and is the best-positioned retailer to win at the convergence of digital and physical retail"

Doug McMillon
Walmart CEO

Walmart

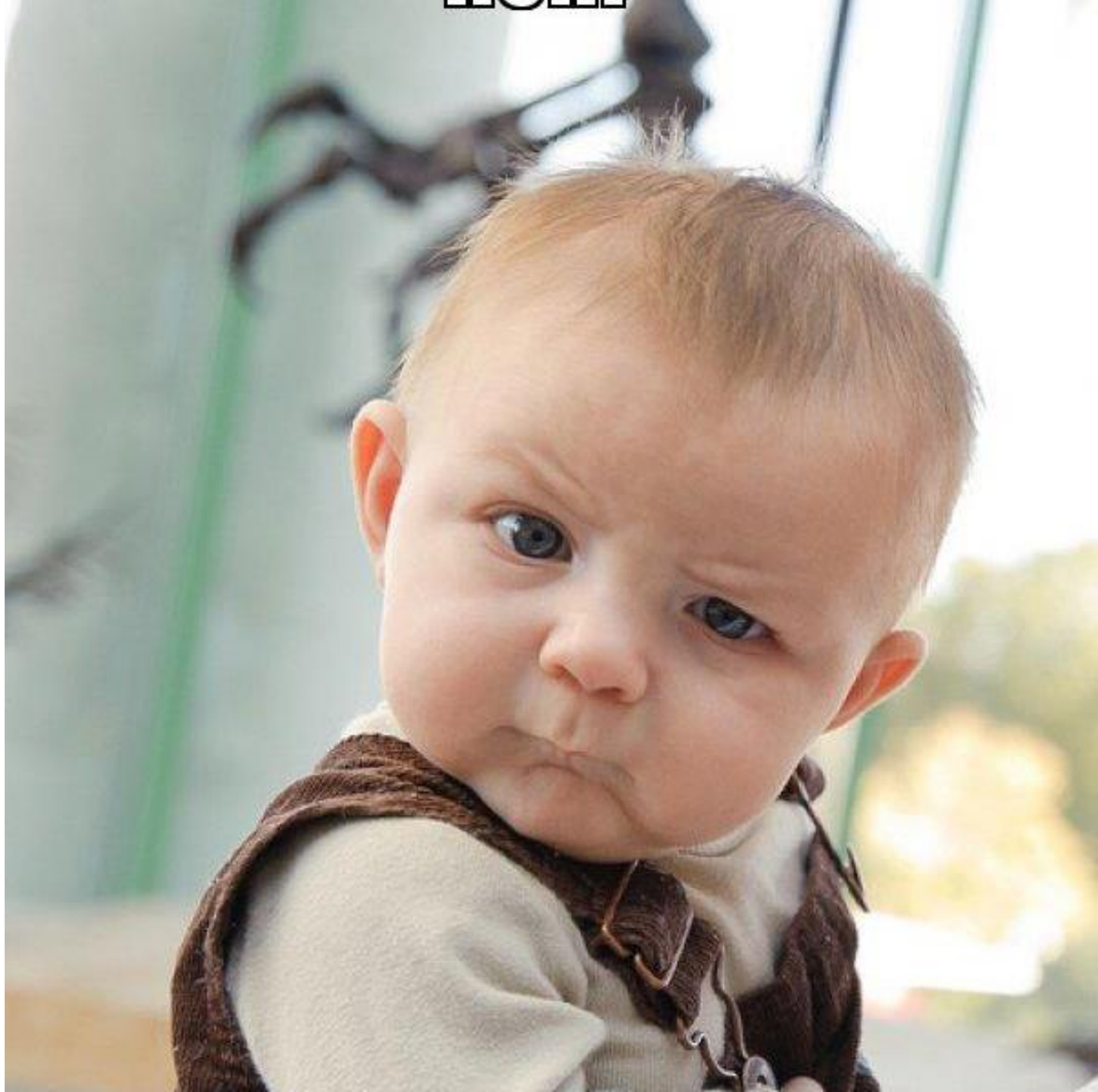
"It's about looking ahead to the changes coming to the global auto business, particularly from potential "disruptors" in Silicon Valley—and preparing Ford to thrive through those changes"

Mark Fields
Ford Motor Company CEO

Ford

Ok, software is important.

So what?



Let’s do some engineering

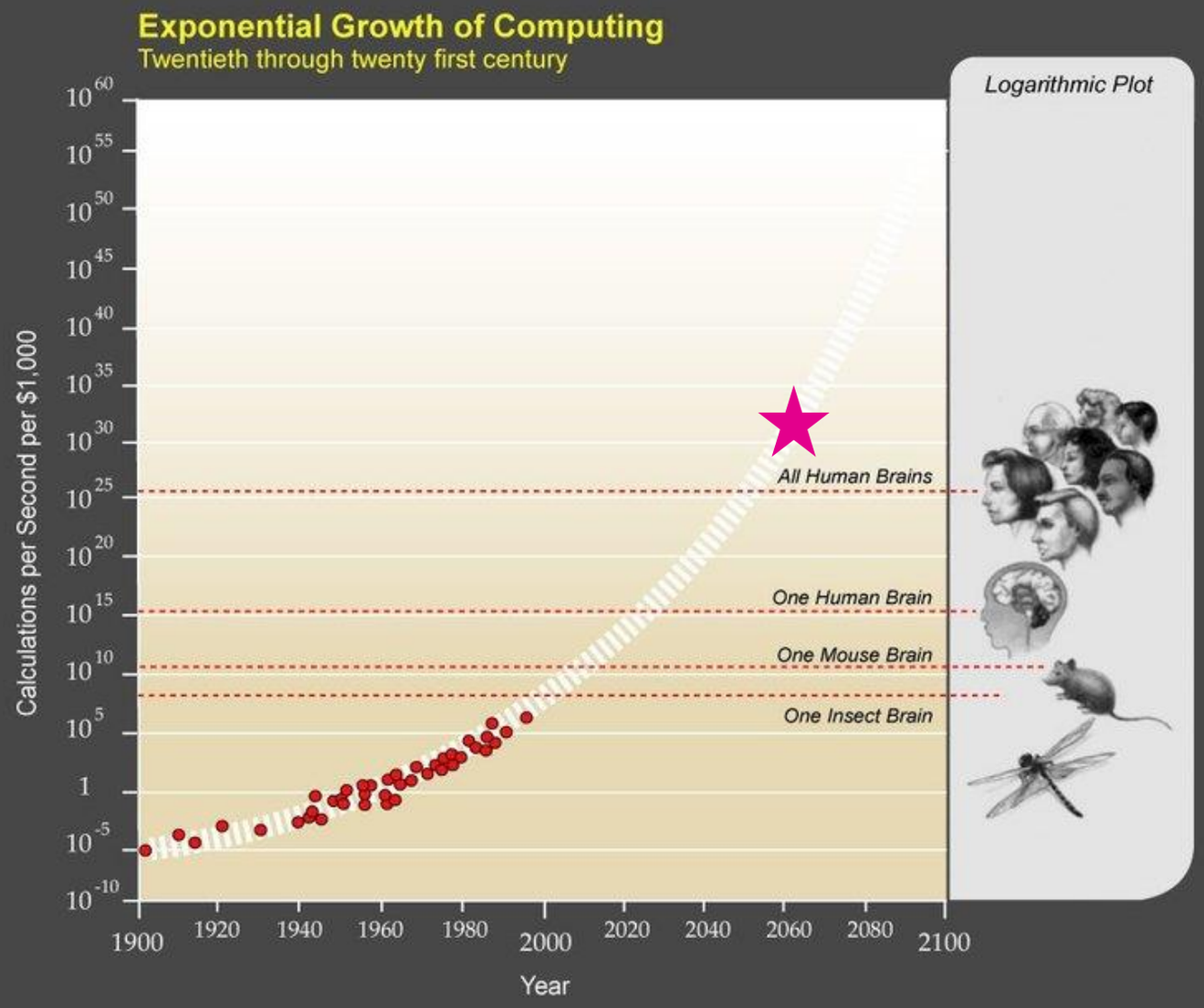


Law of accelerating returns*

★

40 years from now

* Ray Kurzweil



Where will we be in 40 years?

Today

Planetary scale cloud infrastructure
2.5 billion cell phone users
6 connected devices/user in 2020
Smart homes
Smart power grids
Smart chemical processing plants

Trends

Information/education delivery
Control over the physical world
Biological control systems
Attention management
Surveillance
Professional cybercrime
Nation state cyber attacks

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Trends

Information/education delivery!!!
Control over the physical world!!!
Biological control systems!!!
Attention management!!!
Surveillance!!!
Professional cybercrime!!!
Nation state cyber attacks!!!

If software eats the world, where did this software come from?

Engineers!

What could possibly go wrong with that?

If you and I are building our future world….

We need to ask ourselves:

What kind of world do **we** want to build?

“But I just code what I’m told to”

- You are responsible for the moral actions of yourself and your code
- Being a member of a team does not diminish that responsibility
- You have a voice in how your labor is applied to solve problems

- Most of us have way more power than we appreciate:
  We have a choice of projects and employers
- Decide whether a company’s business model aligns with your values BEFORE you accept a job

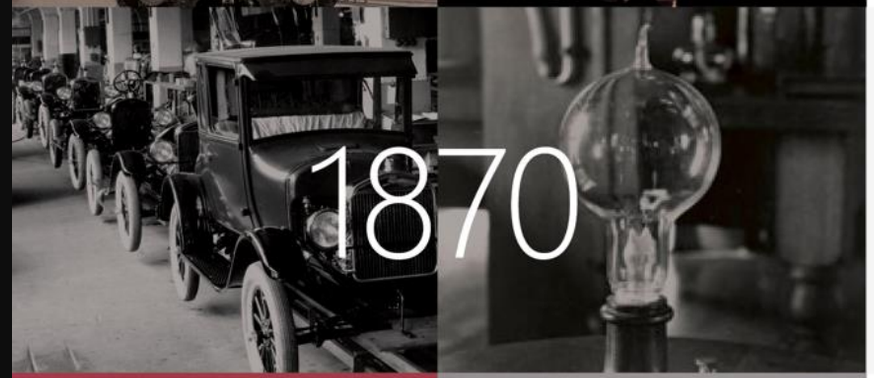
The future presents both opportunities and challenges

The path of human progress



First industrial revolution

Steam, water, mechanical production



Second industrial revolution

Division of labor, electricity, mass production



Third industrial revolution

Electronics, IT, automated production



Fourth industrial revolution

Data analytics, mobile devices, artificial intelligence, machine learning, robotics, genomics

Fourth industrial revolution

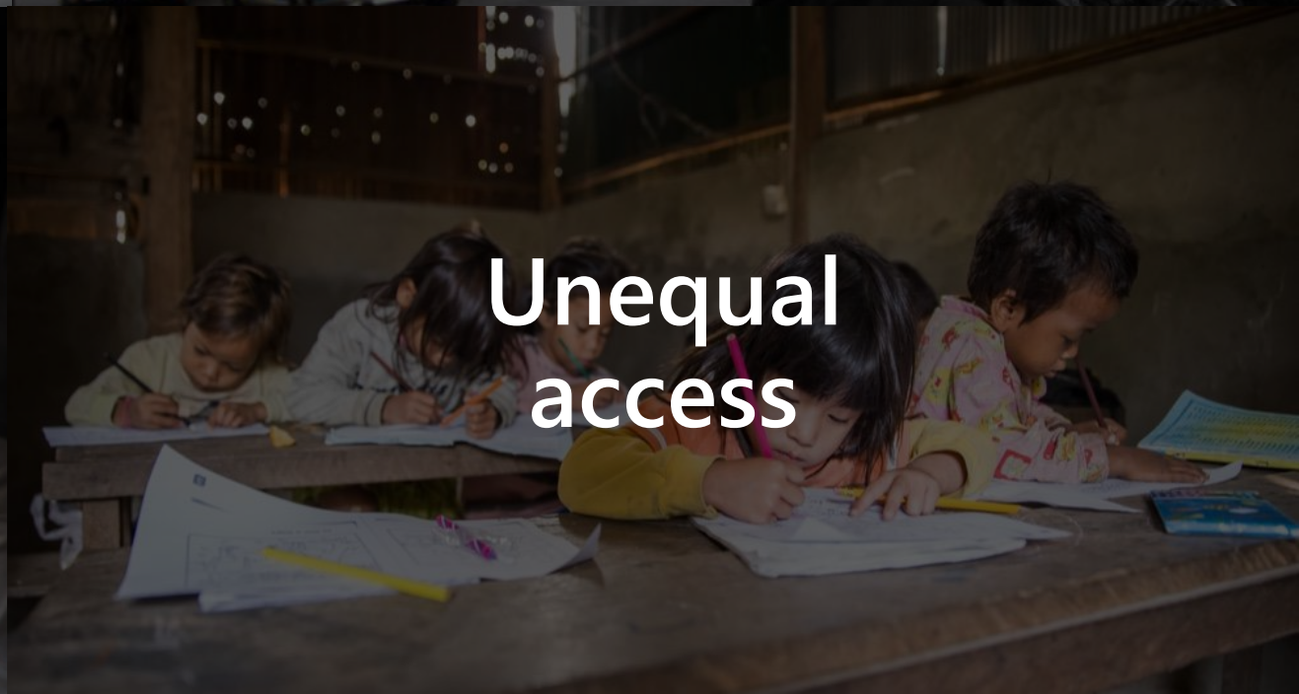
Technology is disrupting everything




Job
displacement


Community
safety

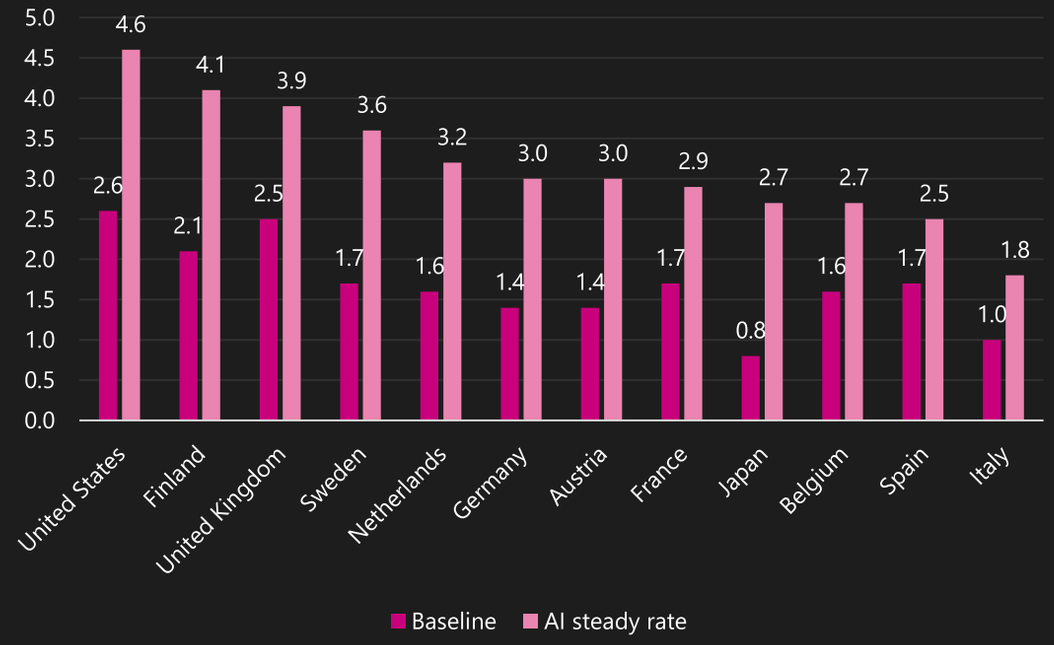

Income
Inequality


Unequal
access

Opportunities

Technologies like AI can increase productivity

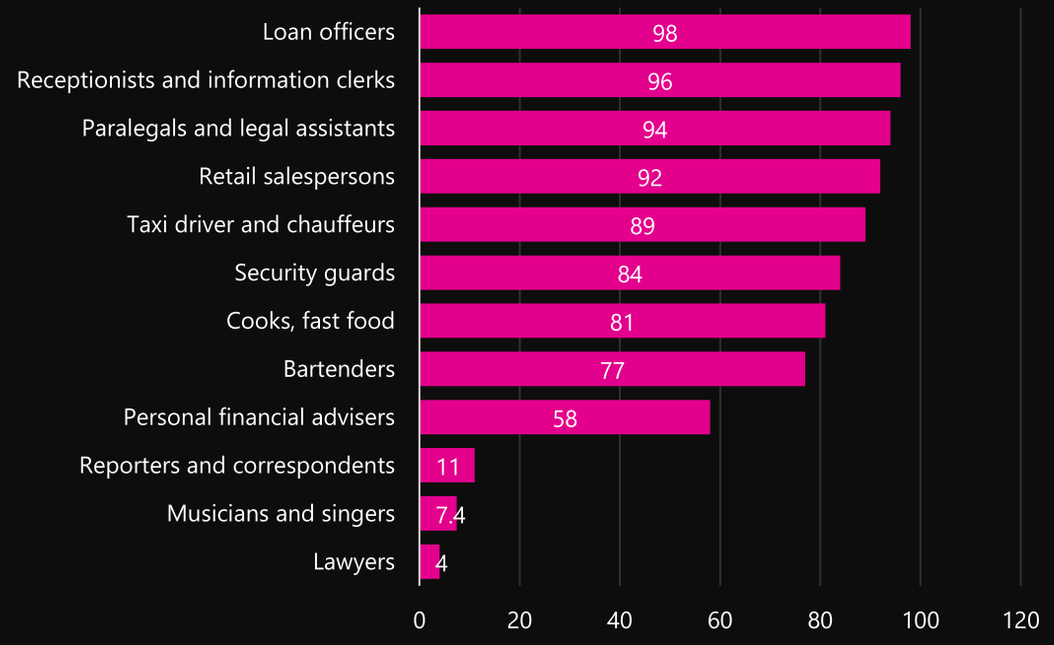
Value creation to GDP growth from AI



Challenges

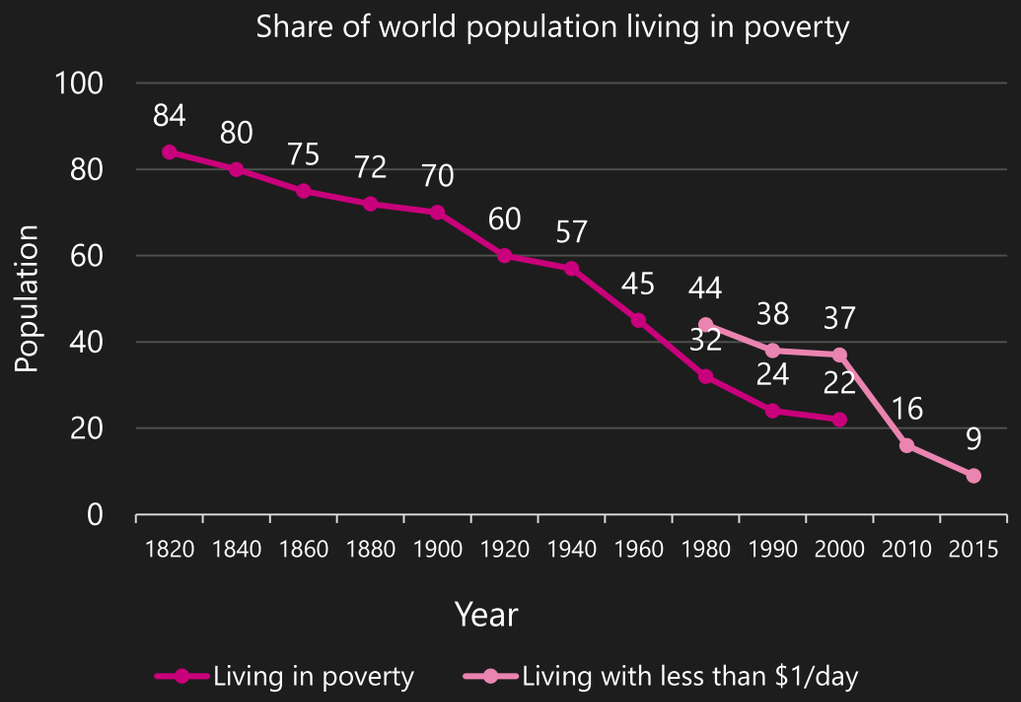
But is displacing jobs

Percent/probability of automation



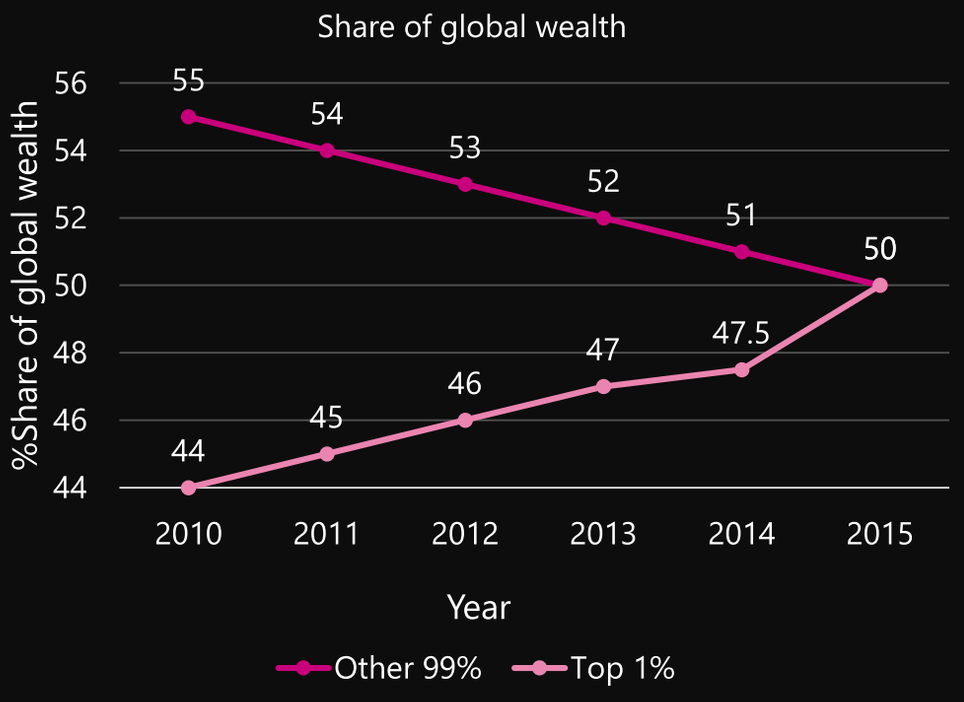
Opportunities

Millions lifted out of poverty



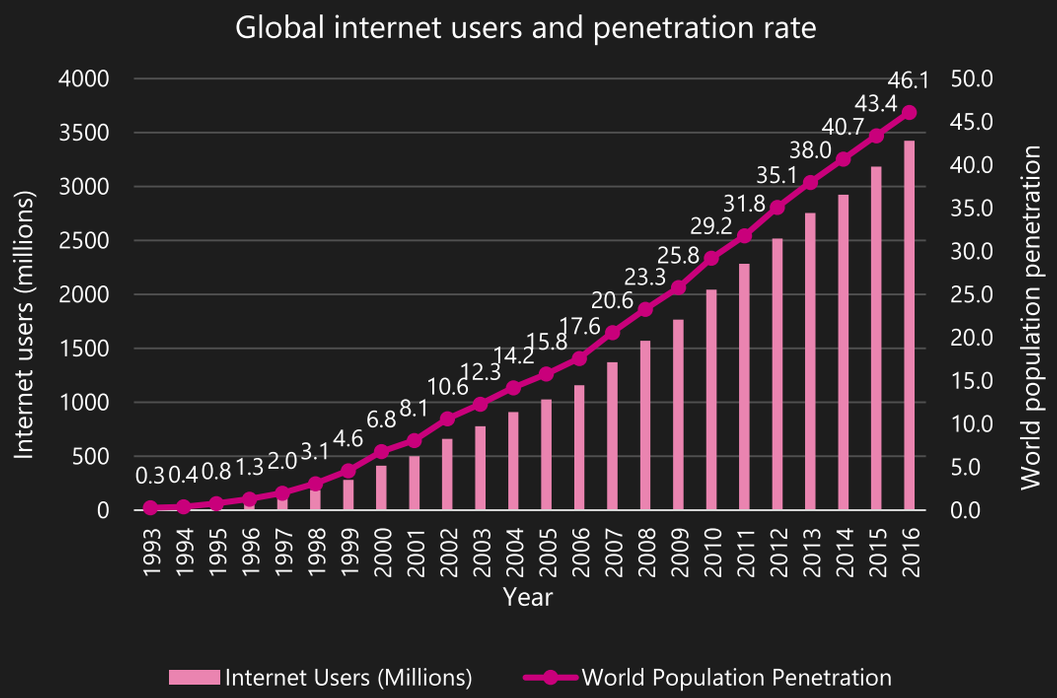
Challenges

But income inequality is on the rise



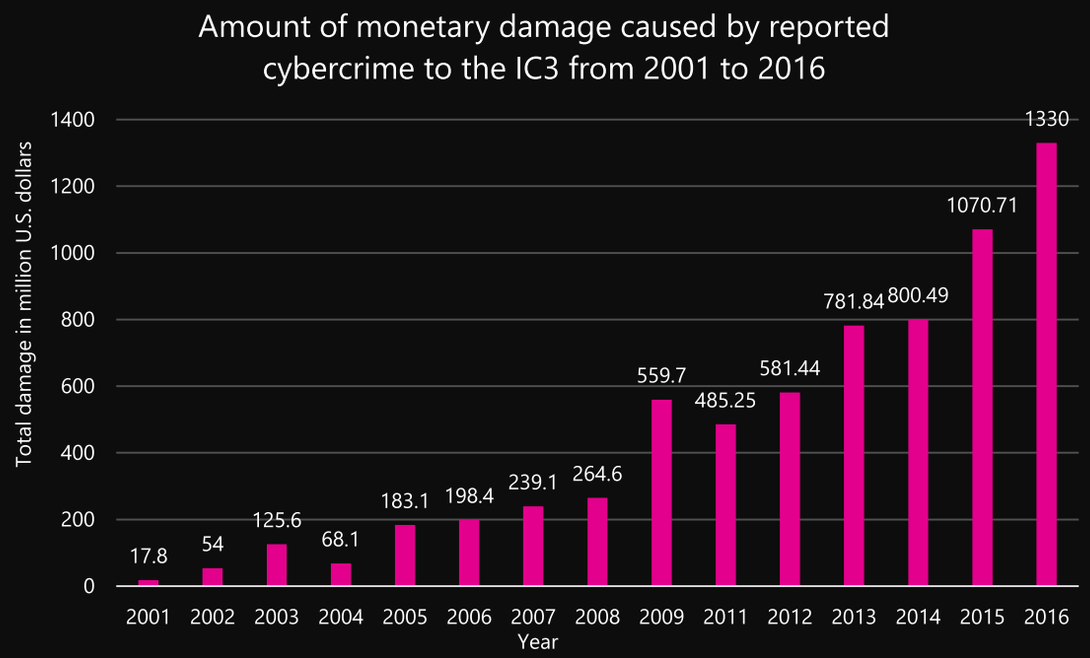
Opportunities

The internet has expanded access to information



Challenges

But it has fueled cyberattacks and cybercrime



Technology does not just transform business… it transforms society and reveals new challenges



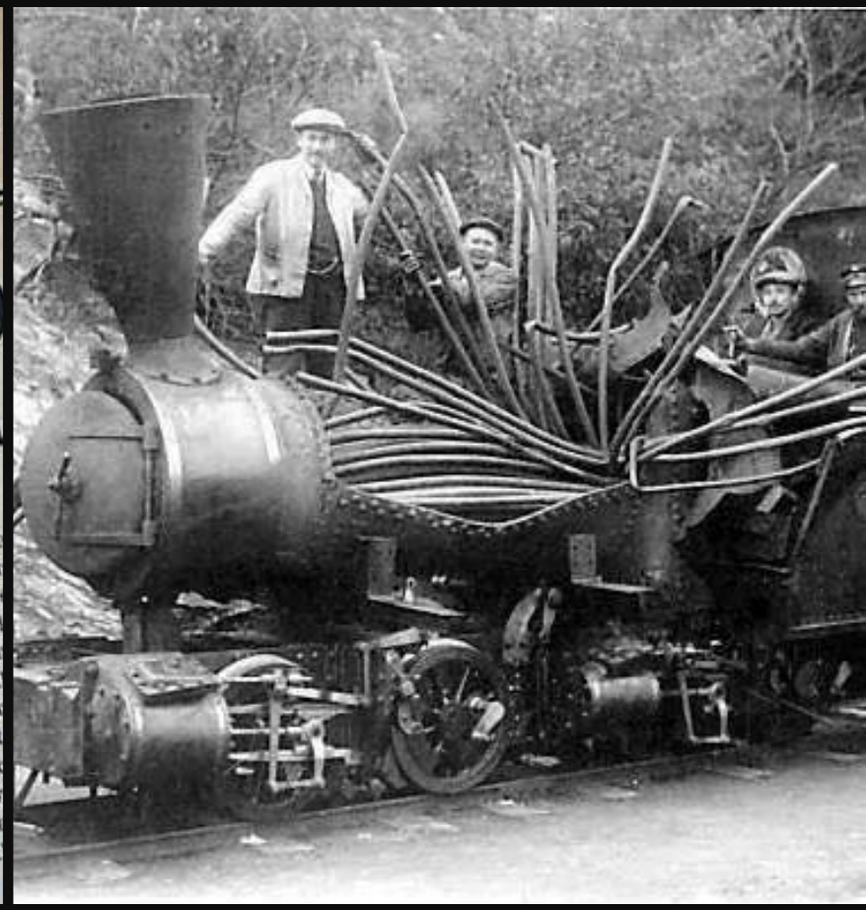


orter.

FIFTY DEAD

Boiler Exploded in Brocton Shoe Fa
ory With Terrible Results.

Brocton, Mass., March 20.—A boiler thirty, twenty-five dead bodie
exploded this morning in the R. B. been taken from the ruins, n
Grover shoe factory, employing six terribly mutilated and burn
hundred hands. A section of the build- make identification difficult
ing in which two hundred hands were possible. A number of inj
working was wrecked and a fire removed to the hospita
started which spread to the adjoining The fire marshall has iss
buildings, several of which were ment saying that reports
employees are des- dicate that the number
believed many of the un- reach fifty. David Rockw
ing an investigation of t



Technology is not just transforming business…
it is transforming society and raising new questions







Building great software means playing the long game

For the sake of technology

Am I using the right tool for the job?
Is this something new or are we reinventing the wheel?
Am I incurring undue technical debt?



For the sake of society

Does this improve peoples lives?
Could this be misused for harm?
What users have been excluded?
Is this ethical?
Is this legal?



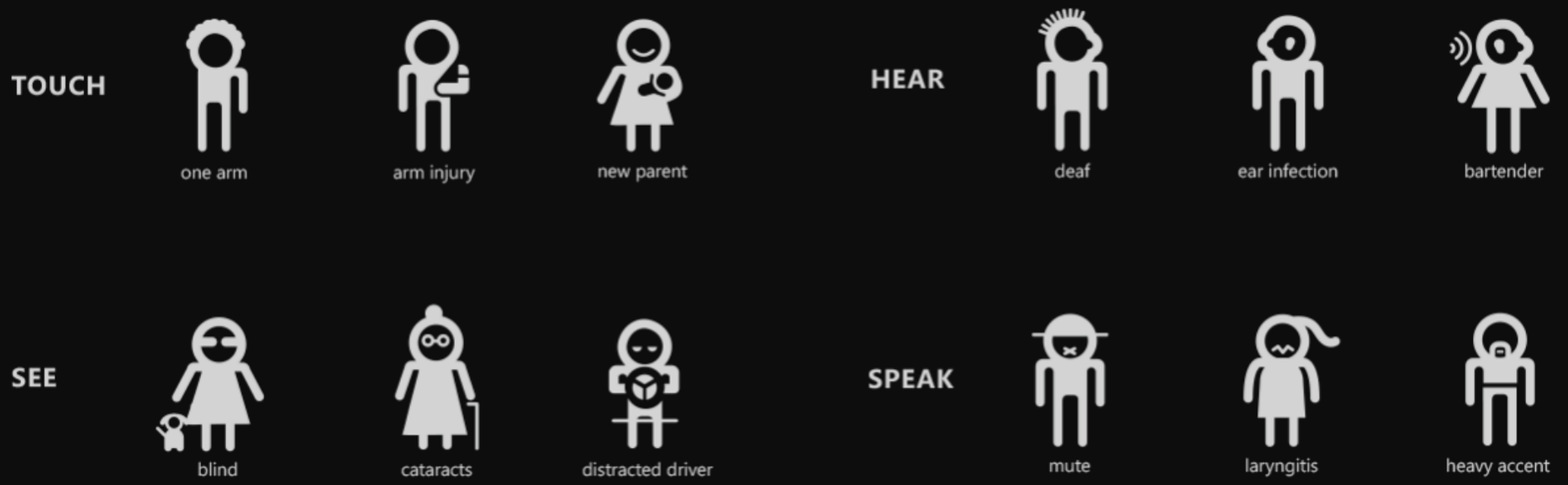
For the sake of business

What is the business strategy?
Does it reduce our flexibility to pivot our strategy?

Are you building for all of society?

Disability is mismatched human interactions
Disability is universal and dynamic
Sometimes disability is temporary
Sometimes disability is situational

As more of our interactions with the world become digitized, inclusive design becomes critical



Microsoft inclusive design toolkit: https://www.microsoft.com/en-us/design/inclusive

Software is too important to forget about ethics

When in doubt, focus on solutions that amplify human dignity

AI Optimism



And

SELF-DRIVING UBER CRASH

DASH CAM VIDEO RELEASED ...

'Disturbing, Heartbreaking'

4.9K 255 3/22/2018 6:30 AM PDT



THE SHOCKING FOOTAGE

AI will not solve all our challenges


The Switch

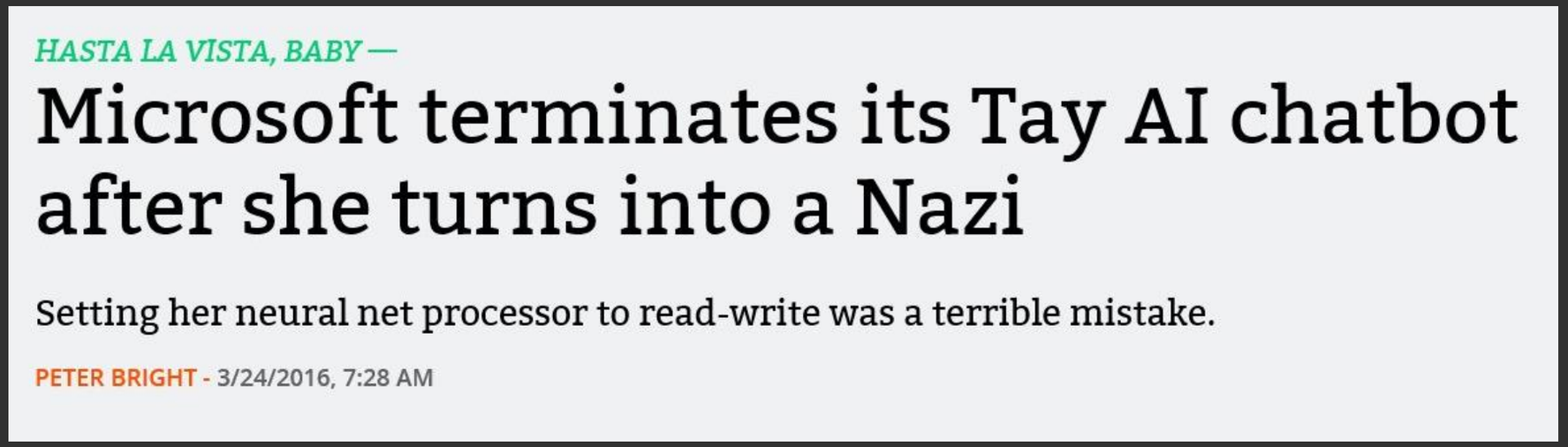
AI will solve Facebook's most vexing problems, Mark Zuckerberg says. Just don't ask when or how.

By Drew Harwell April 11 Email the author


Artificial intelligence (AI)

AI programs exhibit racial and gender biases, research reveals

Machine learning algorithms are picking up deeply ingrained race and gender prejudices concealed within the patterns of language use, scientists say


HASTA LA VISTA, BABY —

Microsoft terminates its Tay AI chatbot after she turns into a Nazi

Setting her neural net processor to read-write was a terrible mistake.

PETER BRIGHT - 3/24/2016, 7:28 AM

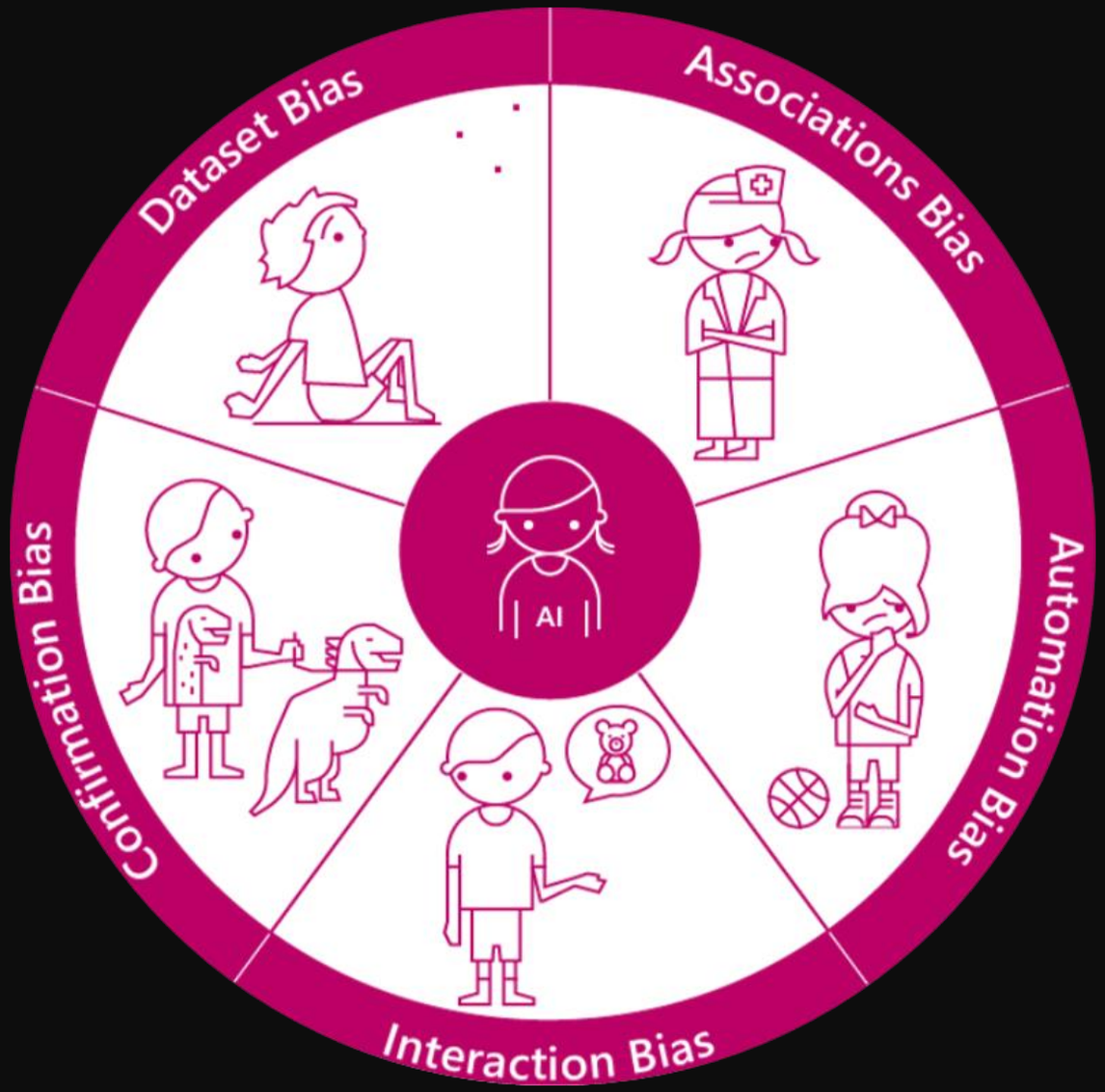

Intelligent Machines

Forget Killer Robots—Bias Is the Real AI Danger

John Giannandrea, who leads AI at Google, is worried about intelligent systems learning human prejudices.

by Will Knight October 3, 2017

Are you building inclusive AI?



Microsoft design blog—how to recognize exclusion in AI https://medium.com/microsoft-design/how-to-recognize-exclusion-in-ai-ec2d6d89f850

AI will cause harm

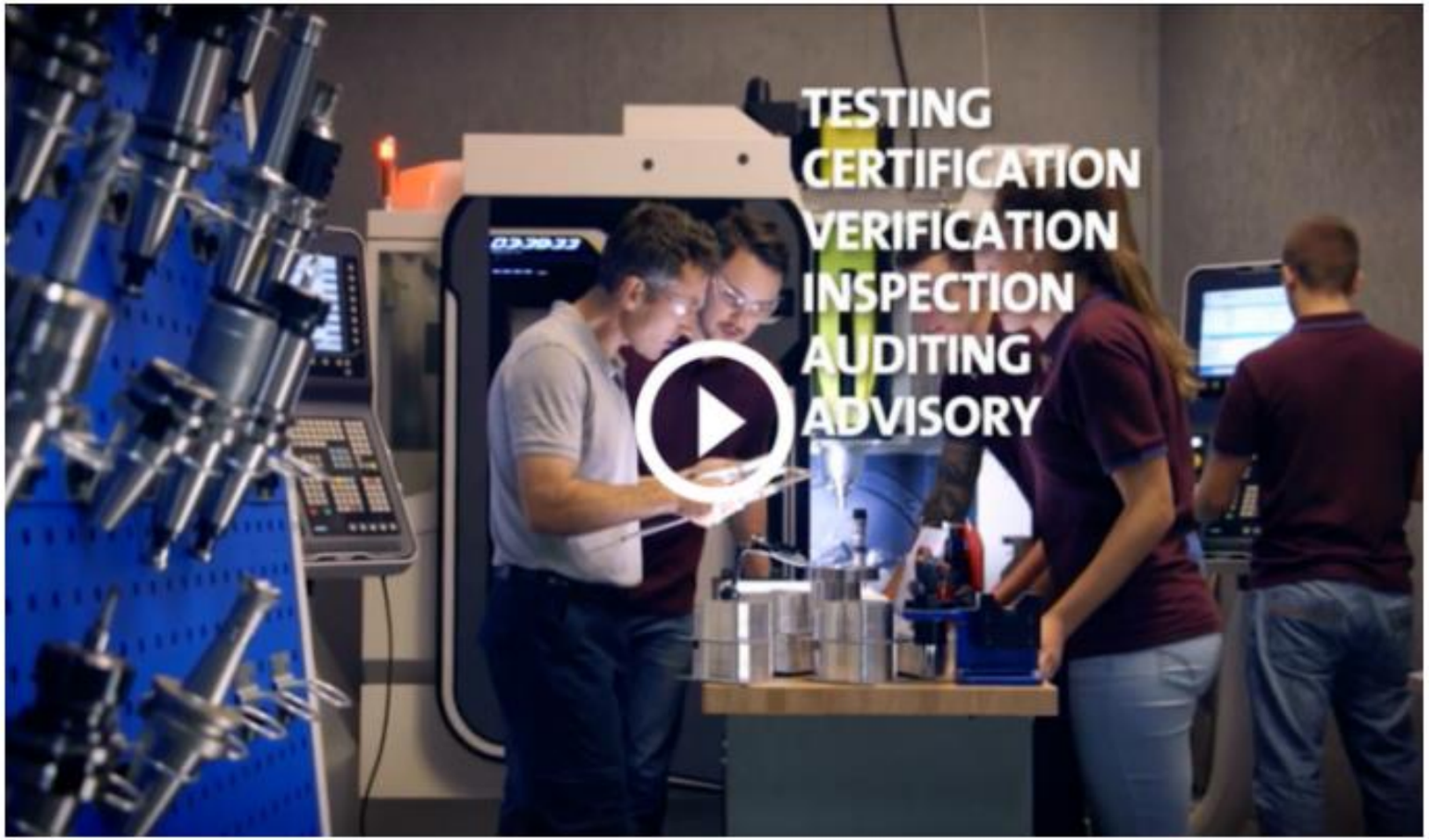
- Glitches as we advance the technology
- Amoral applications
- Machine learning makes fault attribution difficult/impossible

- Backlash & large liability losses will cause more harm
- How do we move forward?
- Underwriters Labs (UL) & Vaccine Court provide models

Underwriters Labs (UL)

What We Do

UL helps companies demonstrate safety, confirm compliance, enhance sustainability, manage transparency, deliver quality and performance, strengthen security, protect brand reputation, build workplace excellence, and advance societal wellbeing. Some of the services offered by UL include: inspection, advisory services, education and training, testing, auditing and analytics, certification software solutions, and marketing claim verification.



National childhood vaccine injury act

- 1980s: most vaccine makers stopped production due to court losses
- Concern over the loss of herd immunity lead the creation of the "Vaccine Court"
- No-fault system for litigating vaccine injury claims with a different burden of proof
- People cannot sue vaccine manufacturers
- Costs covered by a vaccine tax

How do we move forward?



Acknowledge

- We have an evolving dilemma
- We are responsible for the moral acts of ourselves and our products
- Shift focus from shareholder to stakeholder



Lean in

- Educate yourself on the issues
- Participate in the industry, social, and political discussions



Engineer

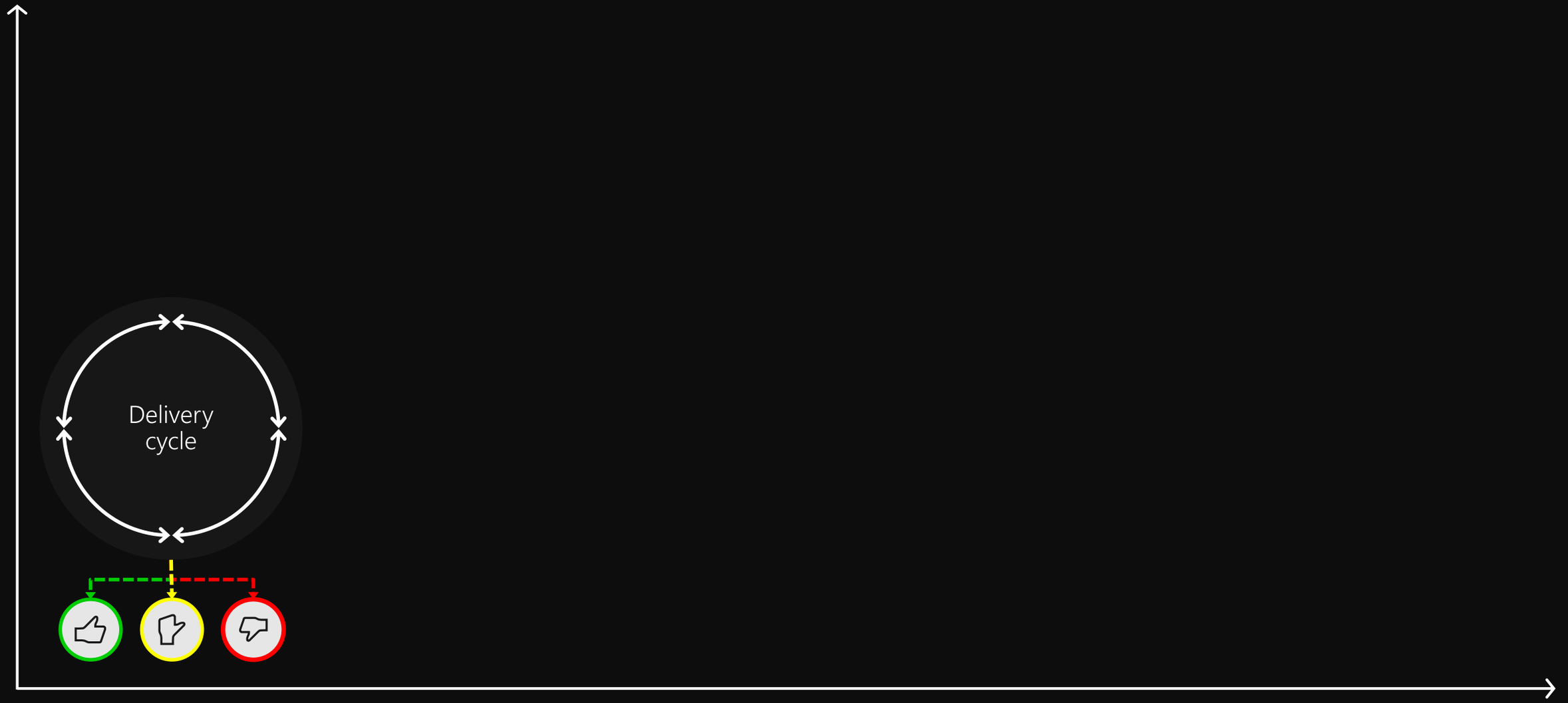
- Incrementally improve yourself, your team, and your product
- Build systems which will find and address problems

Process engineering

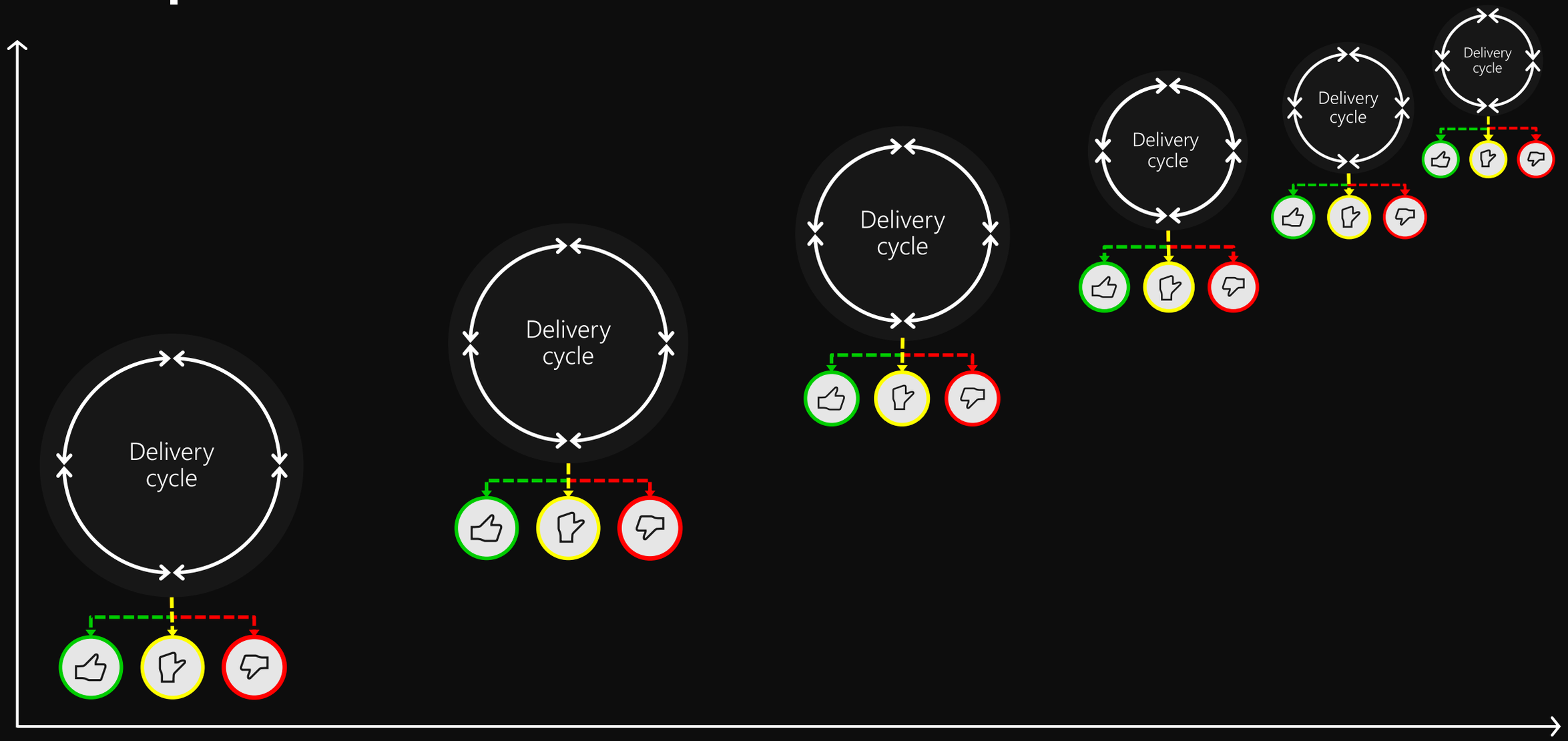
"…at that very moment, one or more people in each of my colleagues' departments were doing something that was illegal or improper… The key was to have mechanisms to find such people before they did too much harm."

—Robert Gates Duty: Memoirs of a Secretary at War

DevOps & the law of thirds



Devops & the law of thirds



Process engineering 101

- Define repeatable steps and measure outcomes
- Make steps smaller and do them faster
- Automate steps
- Modify steps to optimize outcomes
- Problems => new measurements => new/modified steps
- Support and encourage “guilds”
- Continuous patent reviews =>
  - Continuous security, accessibility, ethical, privacy, & social justice reviews

Industry Example: EthicalOS.org

How do I move forward?

When	Then
Setting up CI/CD pipelines	Add ethical checkpoints
Designing software	Ensure inclusion and diversity considerations
Buying products	Pick vendors committed to cybersecurity
Hanging with coworkers	Raise awareness of these issues
Looking for a job	Pick a company aligned with your morals

Most importantly

When	Then
Dying	Leave the world a better place

Thank You


Jeffrey Snover
@jsnover
Tweets
20.5K
Following
1,331
Followers
34.2K

Responsible AI to augment human ingenuity

Three questions we must always ask

1. **System Purpose** — Will the technology be used to augment the abilities of individuals and result in a positive impact on people and society? If no, seek guidance.

2. **Technology Capability** — Are the AI technology and people capable of performing the tasks that the AI system should do? If no, seek guidance.

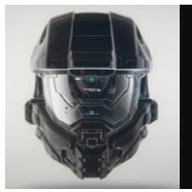
3. **Quality & Reliability** — Will the technology be effectively designed, operated and maintained by a responsible party? If no, seek guidance.

Sensitive categories of AI systems

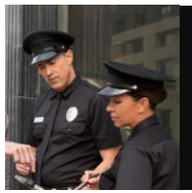
At Microsoft, we recognize that there are sensitive categories of Artificial Intelligent systems which are involved in making automated decisions and recommendations that may have a broad impact on people and society in the following ways:



Denial of Consequential Services



Risk of Harm



Personal Freedom



Guidance

Learn, share, follow AI principles with your teams and customers, to design, develop, and use AI systems responsibly

Ask yourself the 3 questions, using the decision framework to consider the societal and individual impact of AI

Develop and support organizational safety nets thoughtfully governing AI use and seek guidance early in the development process