Ten Year Futures

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S Curves

Global PC installed base (bn)
S Curves
Global installed base (bn)

Source: Apple, Google, e16, TMW, ITU, World Bank

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S Curves

Global installed base (bn)

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S Curves

Global installed base (bn)

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S Curve follows S Curve
Mobile now = PCs in 2005

What can you build on top of the platform?

Ride-sharing, Instagram, Instacart...

PC internet

SEO, SEM, Social...

Mobile internet

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And the future is always boring when we get there

"Innovation is dead"

Mobile internet

"Innovation is dead"
“I arrived in Silicon Valley in 1994 and I thought I was too late and missed the whole thing”

- Marc Andreessen
But there’s always something else coming
So, two innovation conversations today

‘What now?’ and ‘What next?’

What can we build on the billion-scale platforms we have today?

What are the next S Curves - what will the next platforms be?
Massive experimentation around current platforms

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<th>New models and end-points</th>
<th>Meta-conversation</th>
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<td>Bots? Voice? Smart speakers?</td>
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<td>Wearables? Watches? Smart home?</td>
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<td>Social as pop culture, camera as platform</td>
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Big scary tech giants are nothing new...
But maybe there *is* something new about these?

Annual revenue ($bn, real)
Generational change in scale

Employees (000s)

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Source: Bloomberg
Engineers, salespeople, retail, logistics...

Employees (000s)

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Source: Bloomberg
LOTS of logistics

Employees (000s)

- Microsoft
- Google
- Apple
- Facebook
- Amazon

Source: Bloomberg
Just try building an ad-funded content business...

Global ad revenue ($bn, real)

Source: Zenith, Google, Facebook, eMarketer

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Super-evolved organisms?

GAFA seem to have a different mix of character to many tech giants before them

- Massively greater scale
- Everyone read the book – saw Yahoo & MySpace fail
- Founder-controlled (except Apple)
- Four, not one
But winners always look invulnerable, until they don’t

Microsoft’s share of personal computing unit sales (PCs, Macs, Linux, smartphones & tablets)

Source: Gartner, Apple, Google, Microsoft, Nokia, Blackberry, etc
And some of them haven’t quite ‘won’ yet anyway

Annual net revenue ($bn, real)

Source: Amazon, Bloomberg
The winners always look invulnerable, until they don’t

They lose their market, or their market becomes irrelevant
The winners always look invulnerable, until they don’t
They lose their market, or their market becomes irrelevant
So what are the new S Curves, to change all of this?
Real S Curves are never quite smooth

iPhone unit sales (m)
The iPod took almost 5 years to work

Source: Apple
Three phases of creation

- Get the tech to work at all
- Find product-market fit
- Pour on rocket fuel
Four emerging S Curves to consider

- Get the tech to work at all
  - Autonomy

- Find product-market fit
  - Mixed reality
  - Cryptocurrency

- Pour on rocket fuel
  - AI
We’ve all heard of ‘AI’ by now
Unhelpful ways to talk about AI

Data is the new oil!
Google has all the data!
China will have all the AI!
AI will kill us!
AI will take all the jobs!

Calling it ‘AI’
More useful?

Machine learning

Automation

Enabling layers
New companies created, but also a new technology that became part of everything

Machine learning as the new relational database

Oracle → SAP → PeopleSoft, CRM, Expedia, Starbucks, Wal-Mart...
Machine learning = patterns

Techniques to allow statistical analysis of data to find patterns that computers could not see before.
Cat pictures?
What patterns can you look for?

“Is there a cat in this picture?”

“Which customers are about to churn?”

“Will that car let me merge?”

And, the unknown unknowns
Automation means washing machines, not robots

We imagine automation will look like us - humanoid robots, ‘artificial intelligence’.

We did make robots, but we call them washing machines.
There’s no such thing as ‘data’

A dishwasher can’t wash clothes - a voice recogniser can’t find network intrusion.

Data is specific to each vertical and problem.

Many new companies to be created here.
So, what are the washing machines of machine learning?

What can a real company automate?

- Current analysis: Better results for questions and data you have now
- New analysis: New kinds of questions for data you have now
- New data: Data types that computers couldn’t read before – voice, images, video
Mobile

Ride-sharing, Instagram, Instacart
Best use cases may not be clear at the start of the S Curve

Email, stocks, weather?

Ride-sharing, Instagram, Instacart
The same probably applies to machine learning
The same probably applies to machine learning
So, what can we automate next?
Mechanised legs
Ilya Repin, ‘Barge- haulers on the Volga’, 1873
Mechanised arms
Ford production line, 1920s
Mechanised arithmetic
What can you do with automated interns?

Automation replaces humans, but it also gives us the equivalent of millions more. 

Computer → 10 year old → 15 year old → ?
What if computers can see, the way they can read or count?
Automated recommendation?

How does ecommerce change when computers can see what you like?
Automated trend analysis?
Automated process analysis?
Automated disease detection?

Figure 2. Examples images with in field backgrounds from 6 classes in the original cassava dataset. A) Cassava Brown Streak Virus (CBSV), B) Healthy, C) Green Mite Damage (GMD), D) Cassava Mosaic Virus (CMD), E) Cassava Brown Leaf Spot (CBLS), F) Red Mite Damage (RMD).
What if we automate driving?
“Driverless car” = “horseless carriage”

Getting rid of horses changed everything
What do ‘car’ or ‘bus’ mean?

Removing drivers, accidents and internal combustion engines changes all the assumptions

Expect totally new vehicle types
But we also change roads – computers can drive differently
What changes when we automate driving and packetise roads?

- No more accidents
- No more parking
- What happens to congestion, traffic signs, road pricing?
Automatic cars change cities as much as cars changed cities

“It was easy to predict mass car-ownership but hard to predict Wal-Mart”
Machine learning is such an enormous S Curve that ‘change entire cities!’ or ‘let computers see!’ are just applications
Mixed Reality: what if you wear a computer that can see?
Mixed reality 2017 = Multi-touch 2006

Primary technology

Part of the future

Not a commercial product - yet
Mixed reality 2017 = Multi-touch 2006

Primary technology

Working

Part of the future

Not a commercial product - yet
If I could see anything, what should I see?

Add something to the world
Make every wall a screen
Put Minecraft on the table
Show me the recipe

Look at the world and tell me about it
Who is this person?
Is this cheaper on Amazon?
Where did I leave that?
Crypto 2017 = HTML 1994?
Crypto 2017 = HTML 1994?

“I arrived in Silicon Valley in 1994 and I thought I was too late and missed the whole thing”

-Marc Andreessen
Two ways to be at the bottom of the S Curve

- The tech isn’t developed enough yet
  - Autonomy and MR now
  - Smartphones in 2006

- The tech works, but what’s the use case?
  - Cryptocurrencies now
  - Web in 1994
So, if the internet automated this...
And this...
Now ‘crypto’ automates another analogue technology
Money in the cloud for centuries, but it was never software

- Money went to the cloud, then to paper, then to databases
- Contracts, bonds, stocks, deeds and every kind of written trust follows
- All stored in databases
  But all as inert as gold or paper
Two fundamental capabilities

- **Distributed**: Trusted database without a central authority
- **Programmable**: Each record can change, and act on itself and others
Innovation is dead?
Autonomy ➔ Mixed reality ➔ Cryptocurrency ➔ AI
Thank you