



EXPONENTIAL
VIEW

THE EXPONENTIAL AGE

AZEEM AZHAR | SEPTEMBER 2021

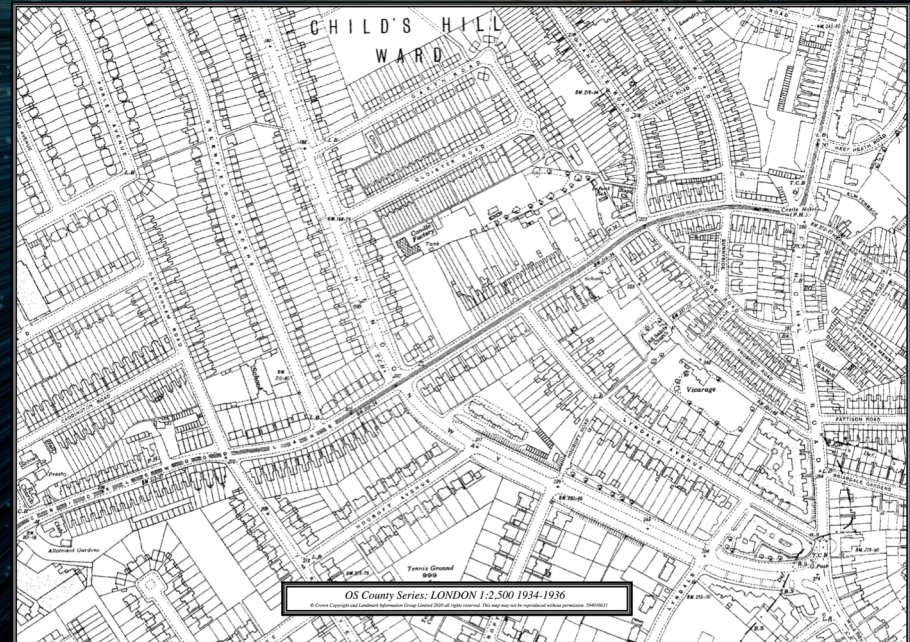
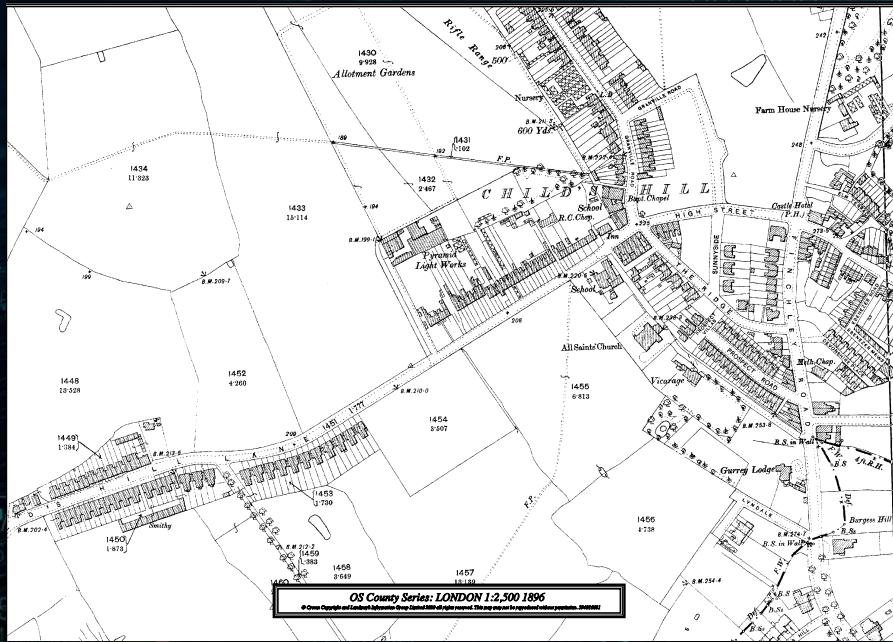
www.exponentialview.co

Azeem Azhar
Creator of *Exponential View*

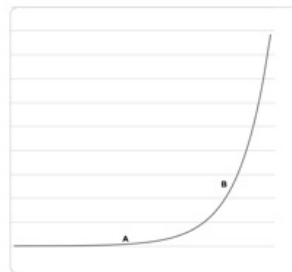
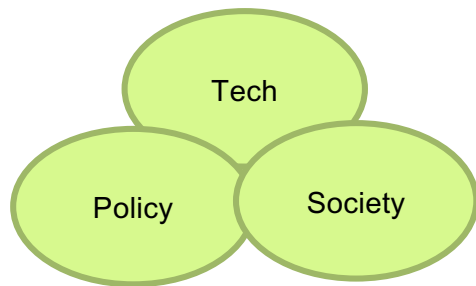
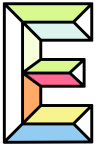
The Exponential Age

How Accelerating Technology is
Transforming Business,
Politics and Society

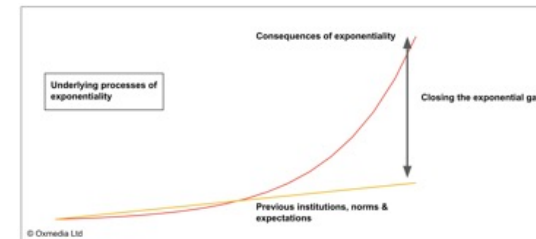
The Exponential Age



The distillation of the idea

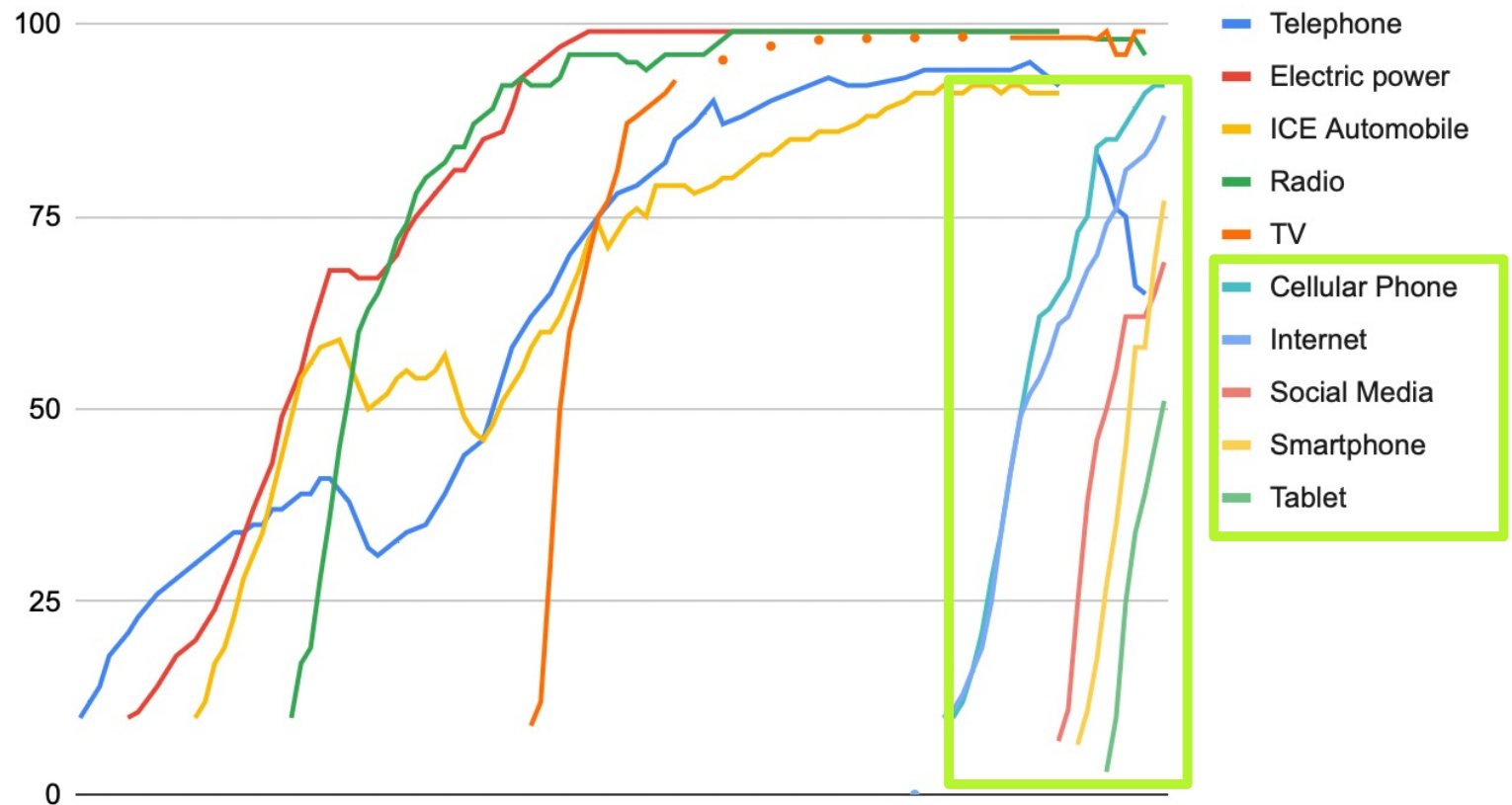
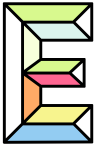


Rapid changing technologies



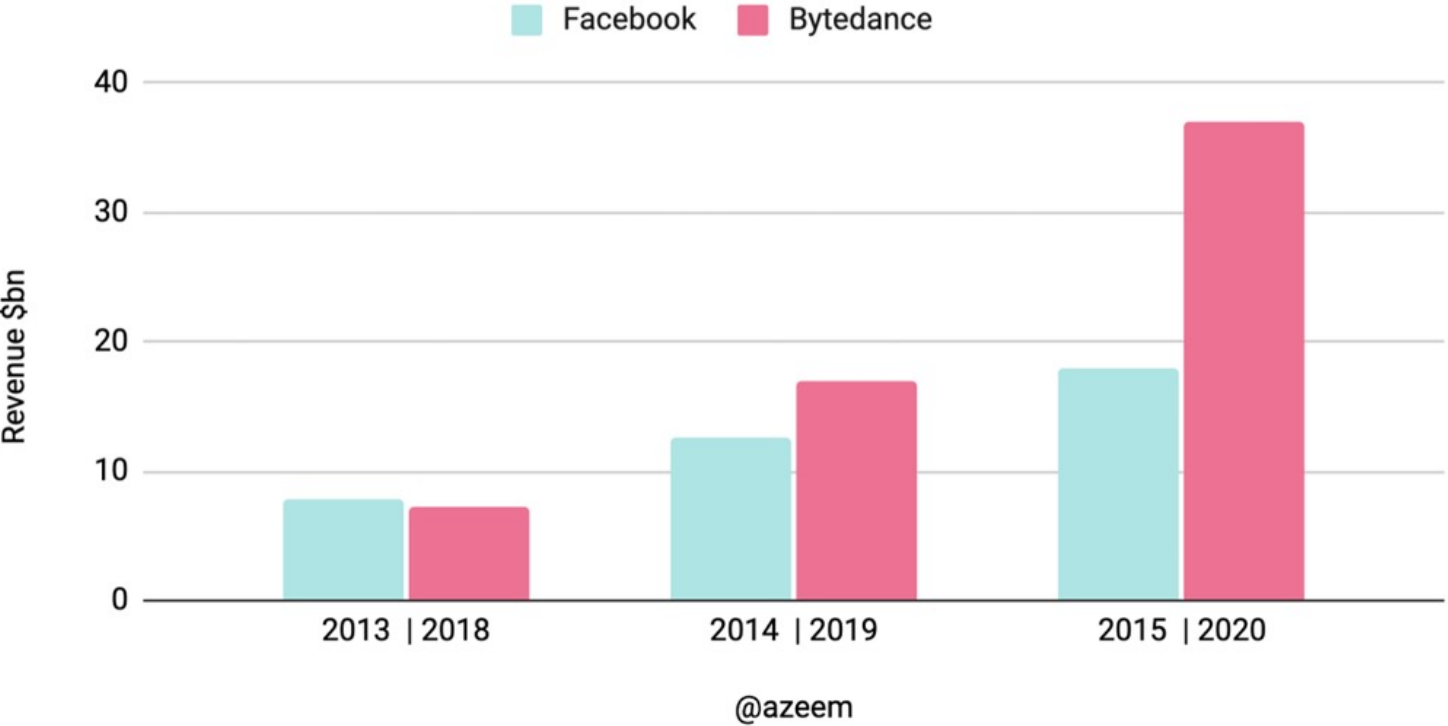
“Exponential gap” – opportunity / chaos

Is the world getting faster?



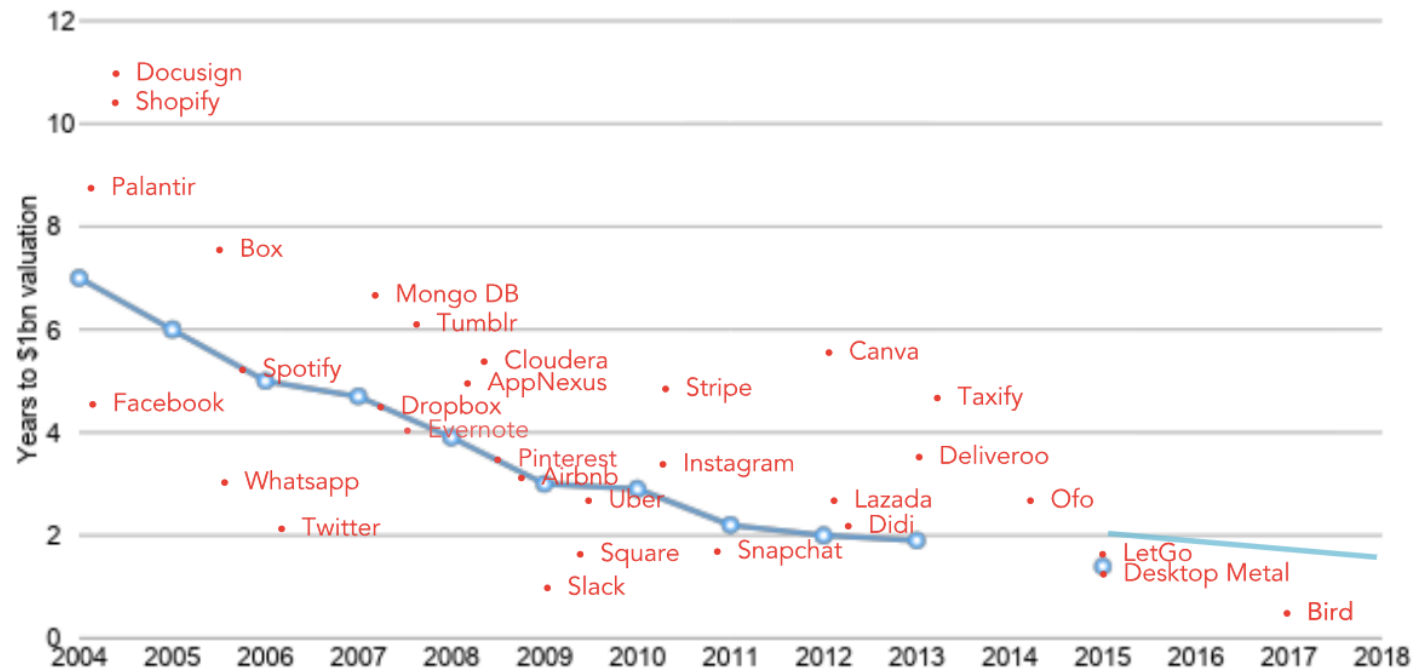
Facebook and Bytedance revenue evolution

From first year where either firm exceeded \$7bn annual revenues



Value is created faster than ever

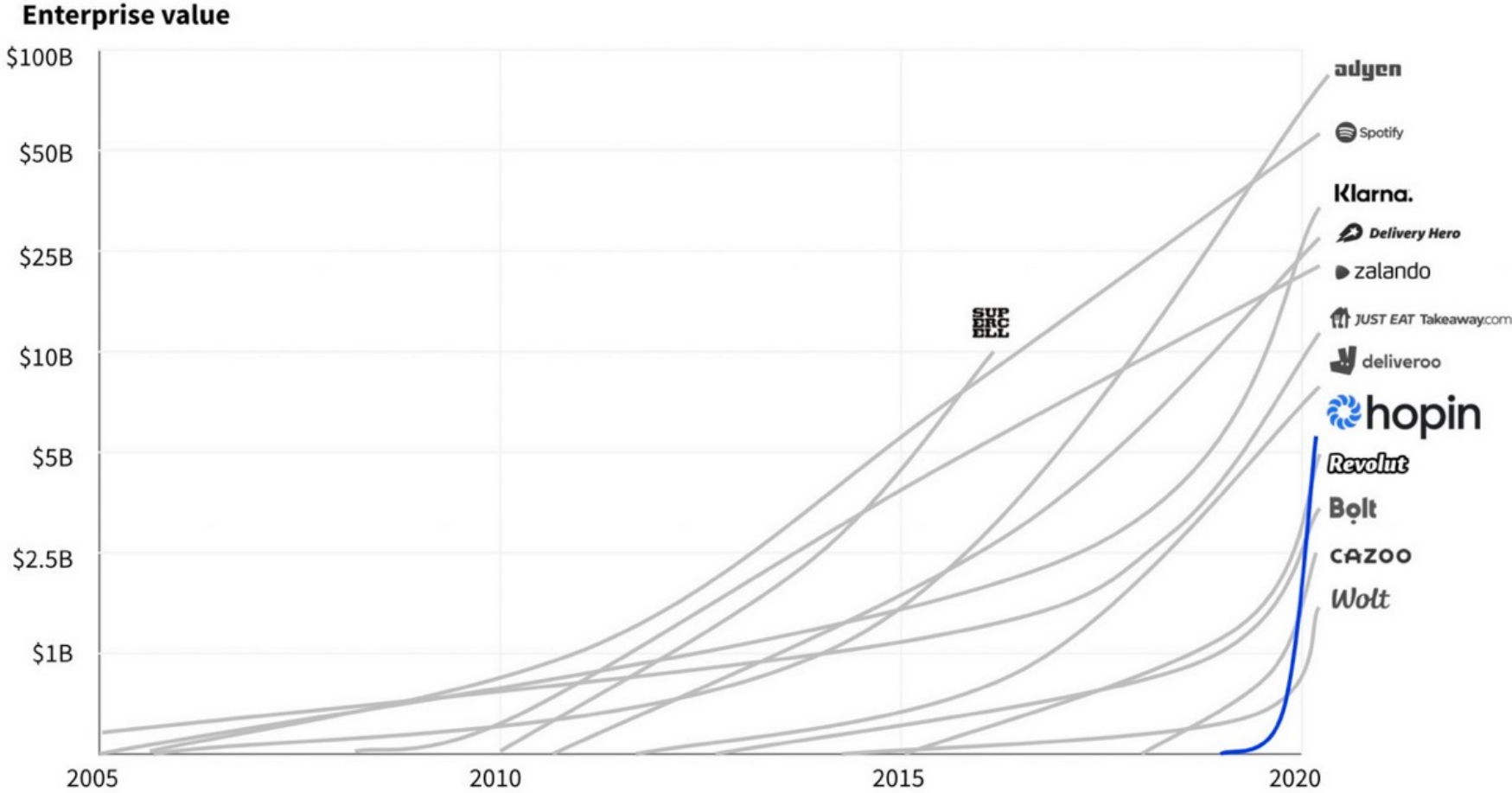
Numbers of years to reach \$1bn valuation from the founding date



Source: GartnerSYM, 2016; CB Insights, 2018; Exponential View analysis

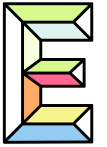
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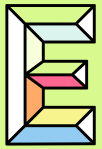
Founded in 2019, Hopin is the definition of hockey-stick growth.



Source: Dealroom.co and Google Finance as of March 1st, 2021.

4 General Purpose Technologies





TRANSITIONS CREATE GENERATIONAL WINNERS

STEAM



Horace Dediu 
@asymco

The 19th century saw explosive growth in mobility through the mass adoption of steam power. You could travel around the world in 80 days. And yet none of the steam titans, the rail/ship magnates, barons, industrialists, capitalists had any part in creating automotive mobility.

5:45 PM · Jun 28, 2021 · Tweetbot for Mac

ICE/TELEPHONE/ELECTRICITY

Largest US companies (2009)

- | | | |
|----|----------------------------|--------------------|
| 1 | Exxon Mobil Corporation | ICE (1870) |
| 2 | Wal-Mart Stores, Inc. | |
| 3 | Chevron Corporation | ICE (1879) |
| 4 | ConocoPhillips | ICE (1875) |
| 5 | General Electric Company | Electricity (1892) |
| 6 | General Motors Corporation | ICE (1908) |
| 7 | Ford Motor Company | ICE (1903) |
| 8 | AT&T Inc. | Telephone (1878) |
| 9 | Hewlett-Packard Company | |
| 10 | Valero Energy Corporation | ICE (1955) |

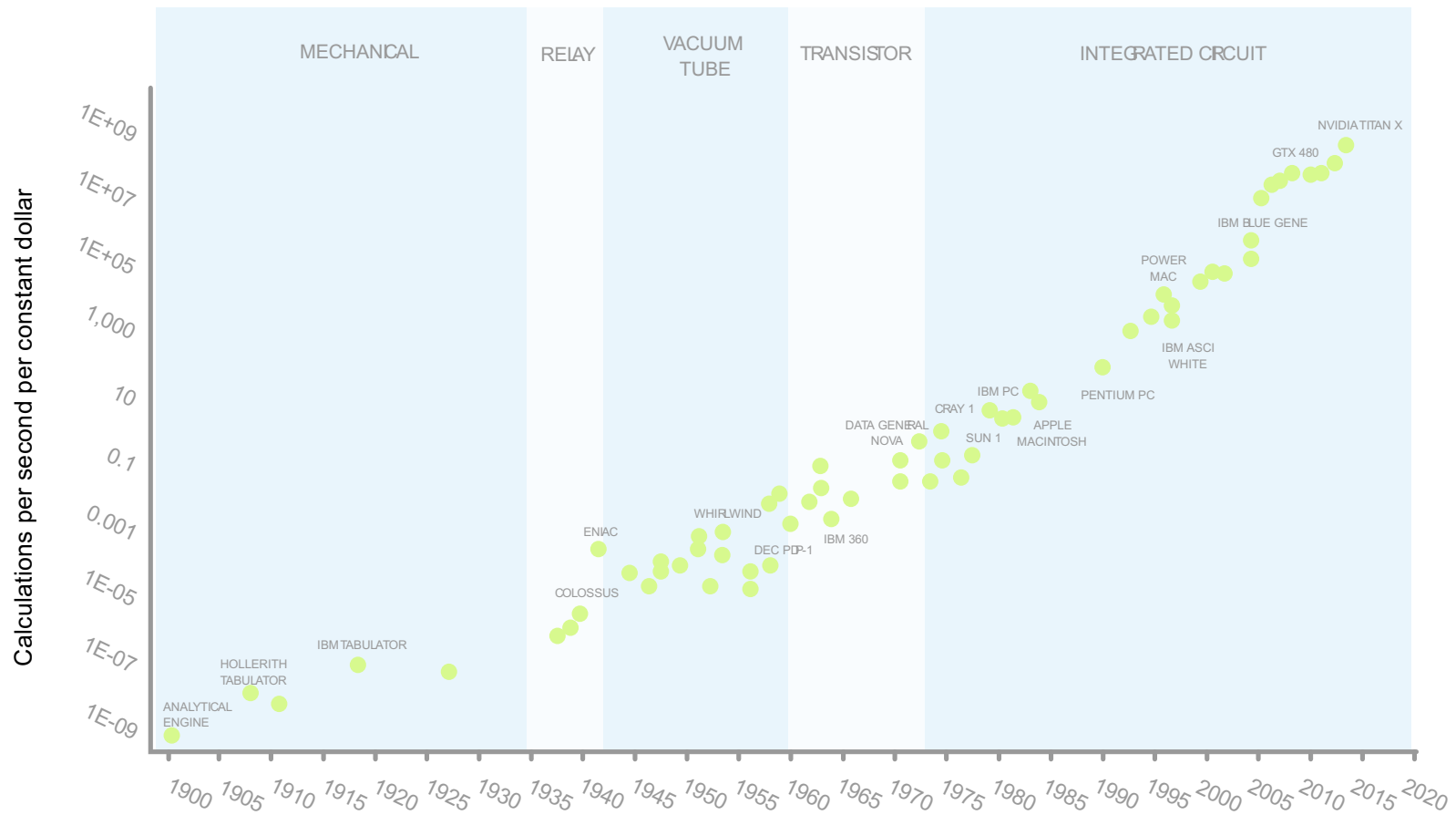
EXPONENTIAL TECH

Early winners have emerged in computing and Internet sectors.

However, the remainder of the economy needs to undergo its transition to build the generational winners of the 21st century.



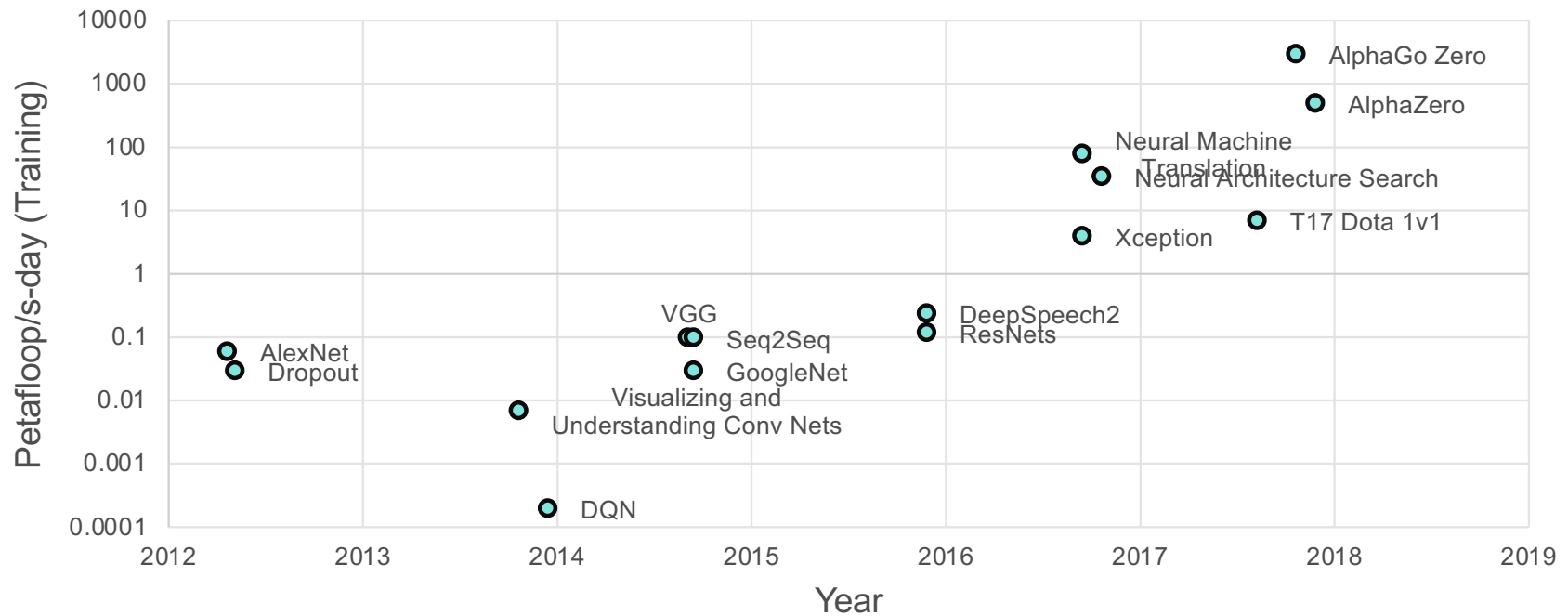
120 Years of Moore's Law



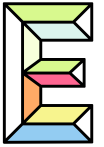
AI demands grew faster than Moore's Law



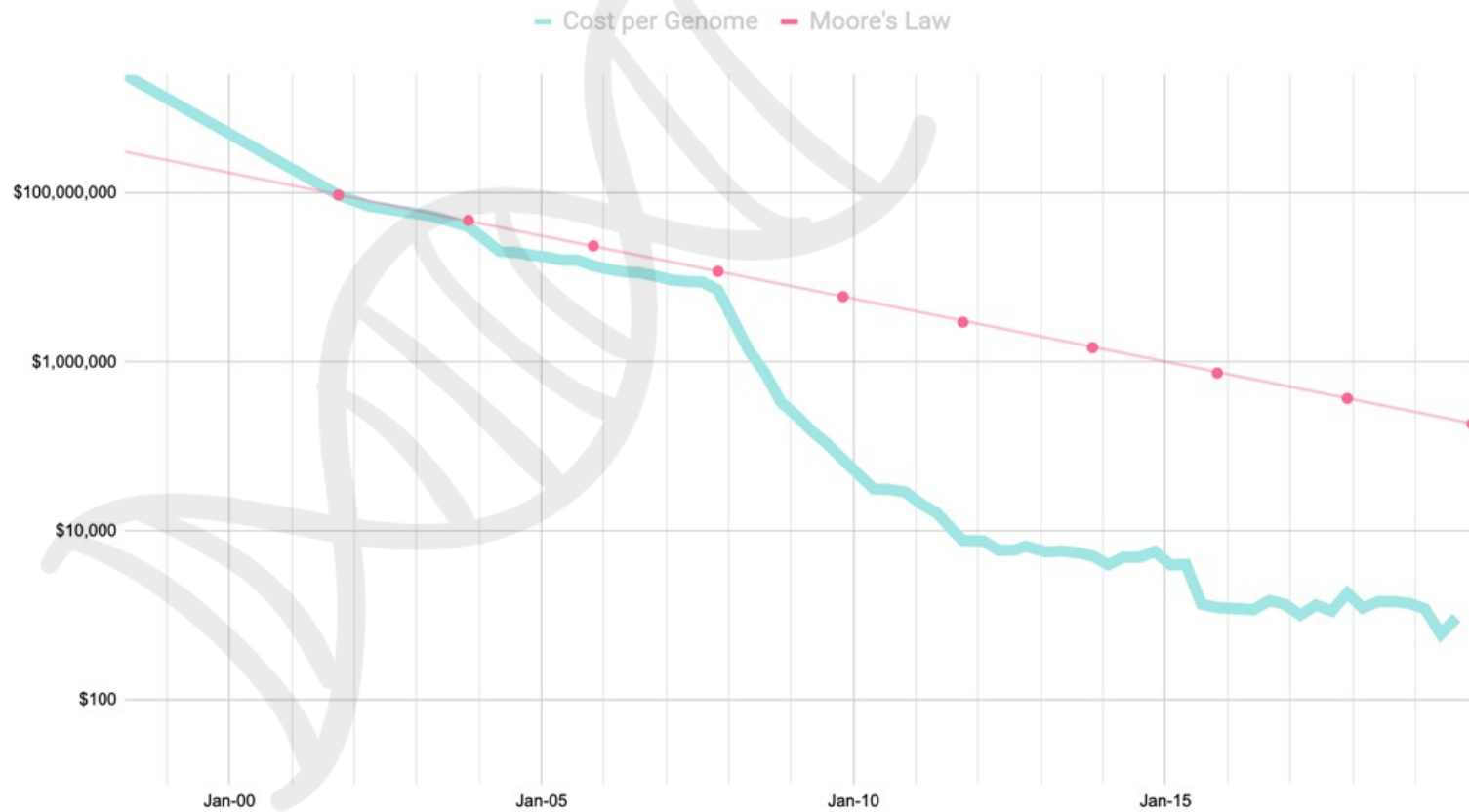
AlexNet to AlphaGo Zero: A 300,000x Increase in Compute



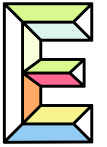
The collapsing cost of reading our genes



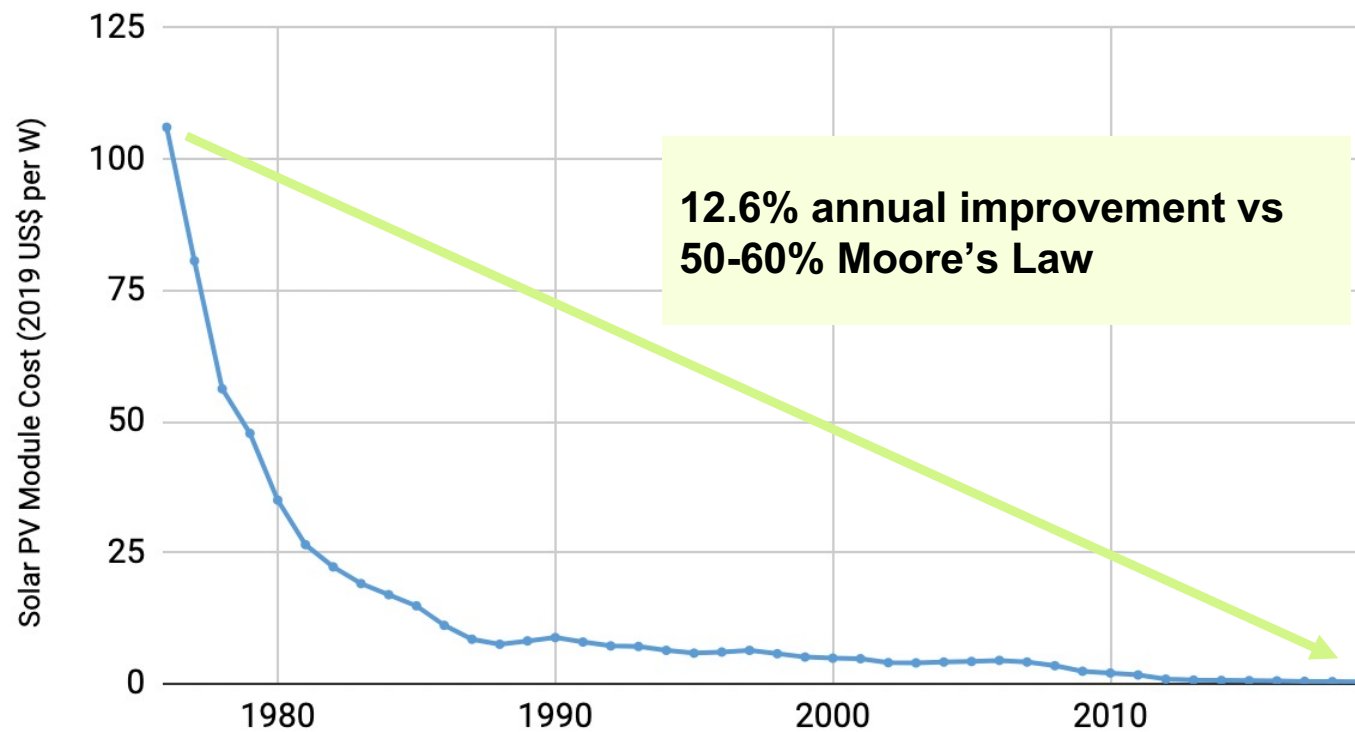
Cost of genome sequencing



Solar PV module pricing has declined



Solar PV Module Cost (2019 US\$ per W) vs. Year



Source: OurWorldInData

Battery pack pricing

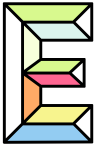
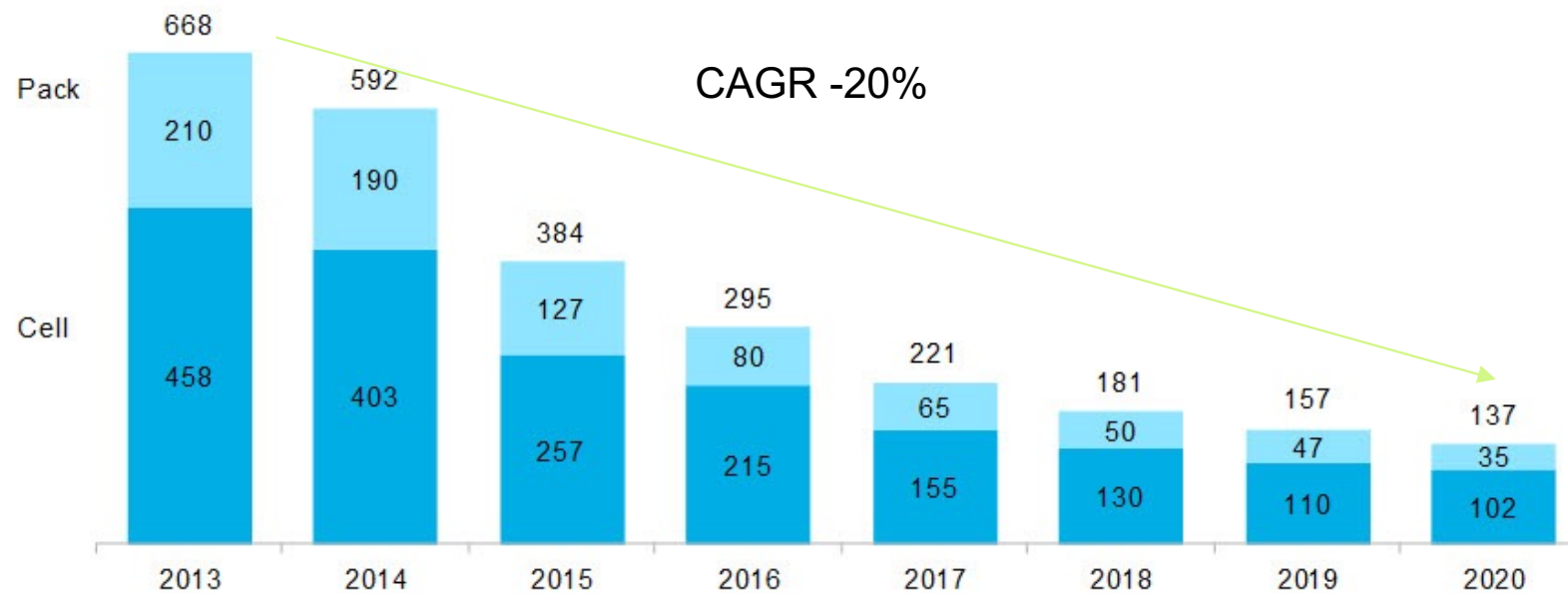


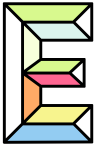
Figure 1: Volume-weighted average pack and cell price split

real 2020 \$/kWh

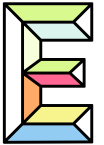


Source: BloombergNEF

Virtual power plant platforms

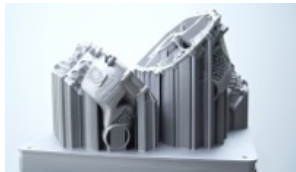


3-d printing is an exponential technology too



CubeSat bus

1 part not 125 parts
50% lighter, 20% stiffer
6x fewer failure points



Porsche components

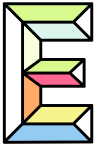
10% lighter
Twice as stronger



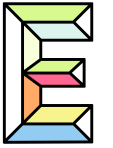
Inkjet-powder 3DP	35%
Metal laser sintering	33%
Fused filament fabrication	17%
Nonmetal SLS	21%
3DP overall	29%

Source: Is There a Moore's Law for 3D Printing? Benson et al. 3D PRINTING AND ADDITIVE MANUFACTURING Volume 5, Number 1, 2018

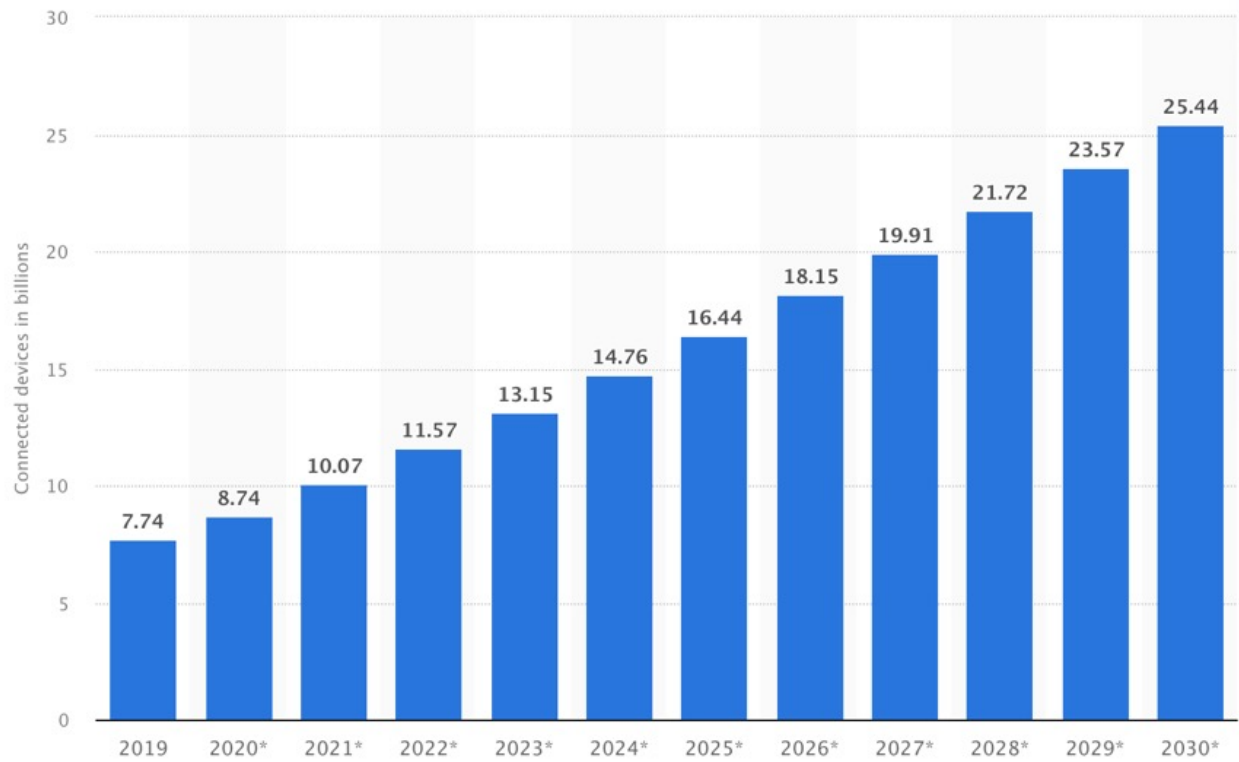
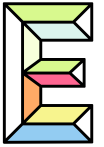
Declining prices drive increased uptake







Consider IOT



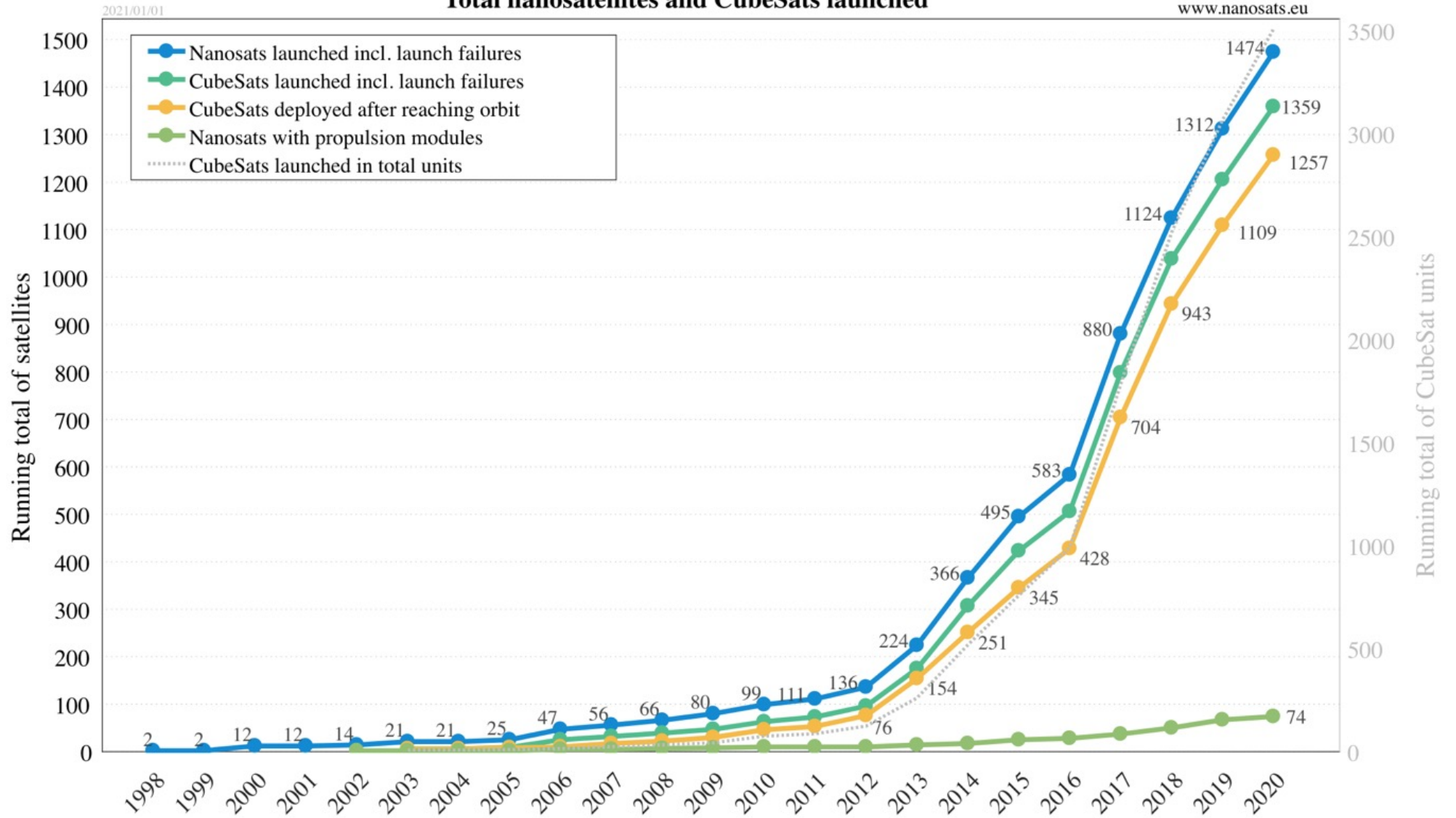
2040?

50bn?

100bn?

500bn?

Total nanosatellites and CubeSats launched





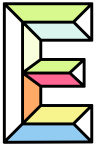
**Employment
bargain**

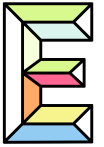
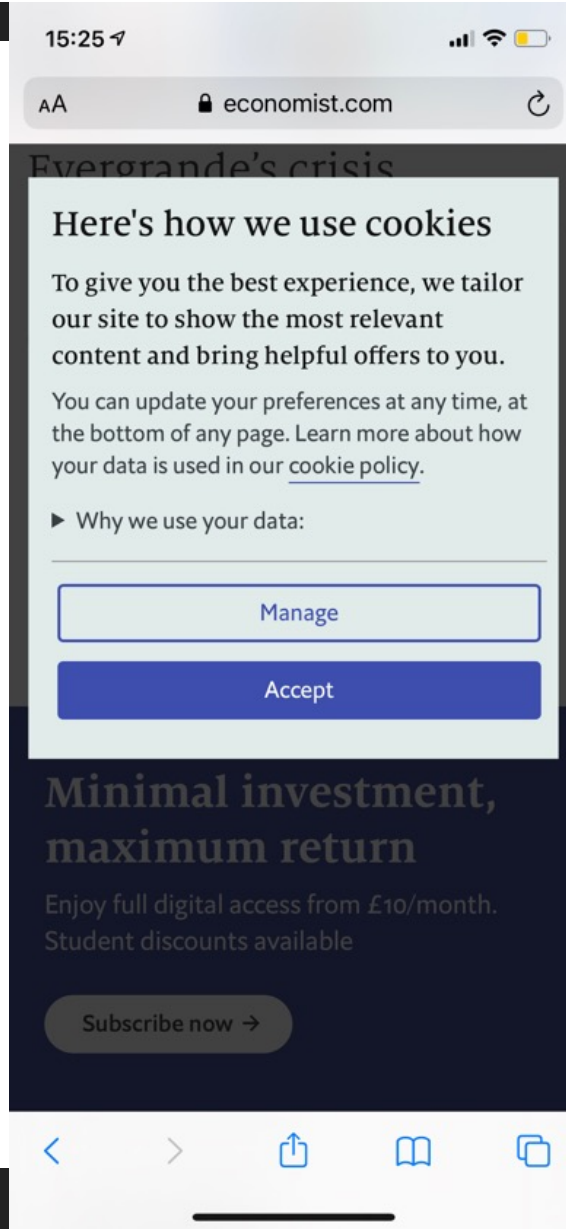
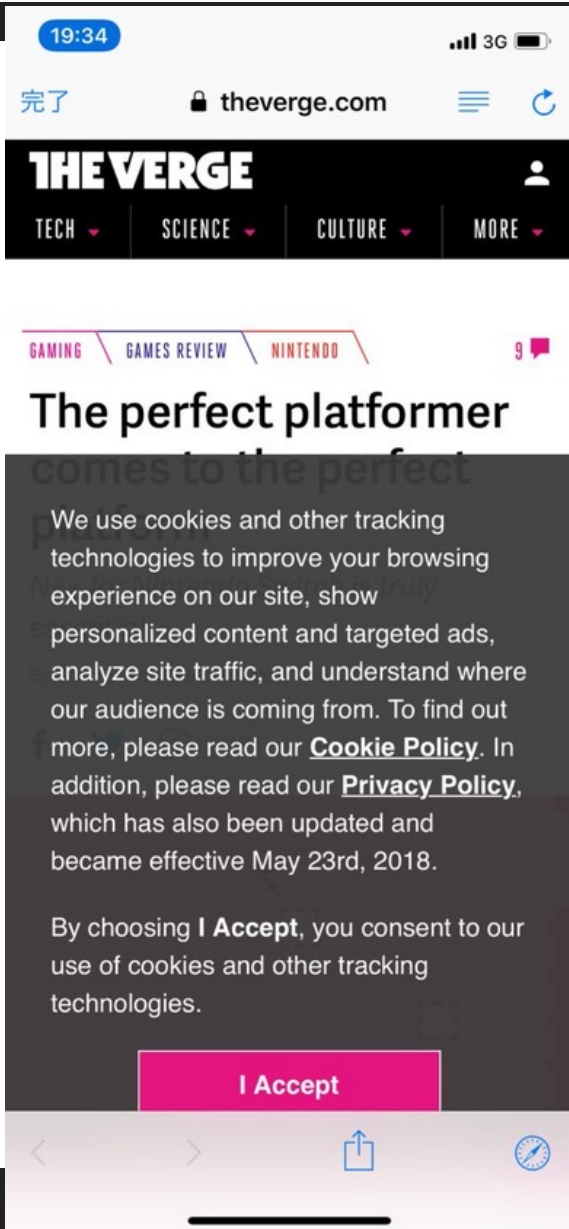
**Fordist
management**

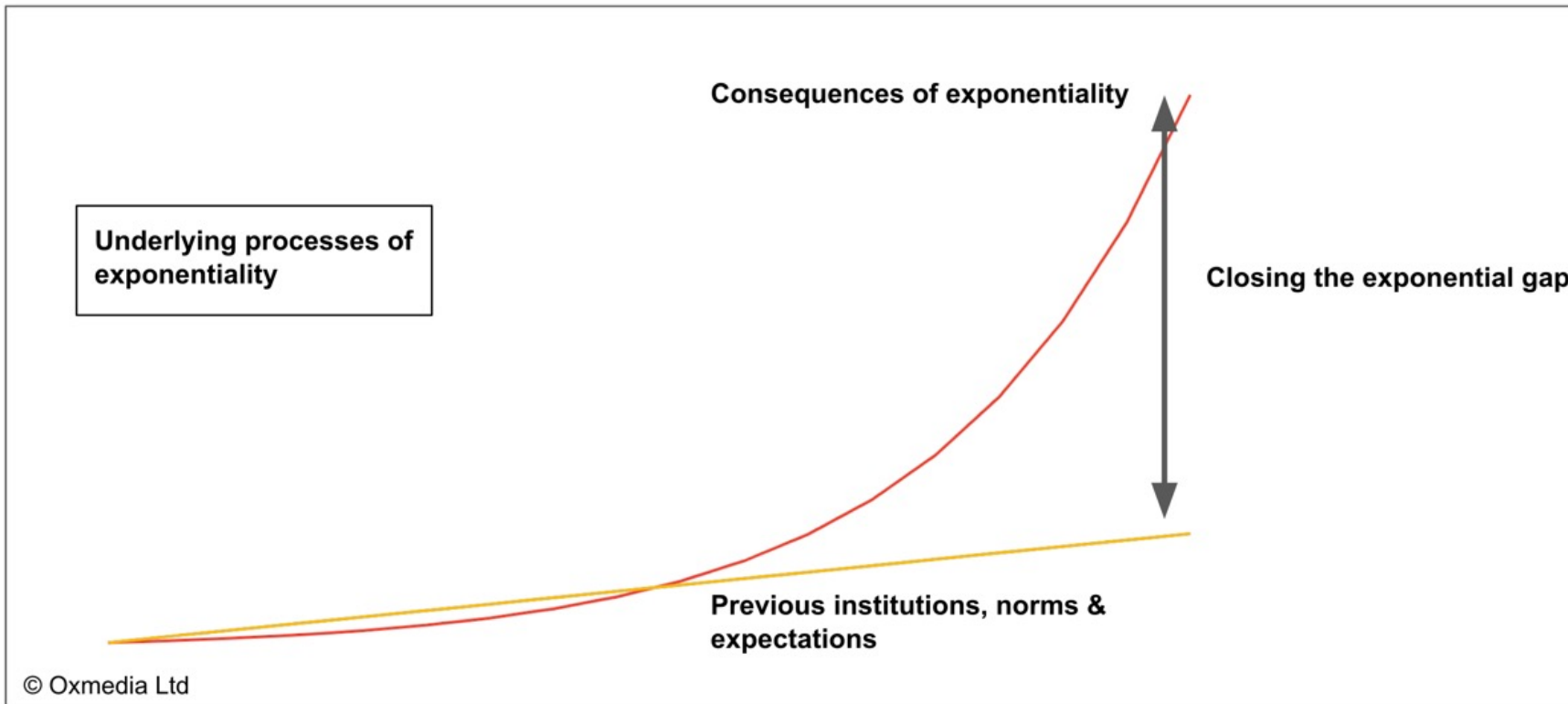
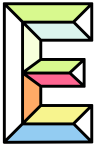
Welfare nets

Auto regulation

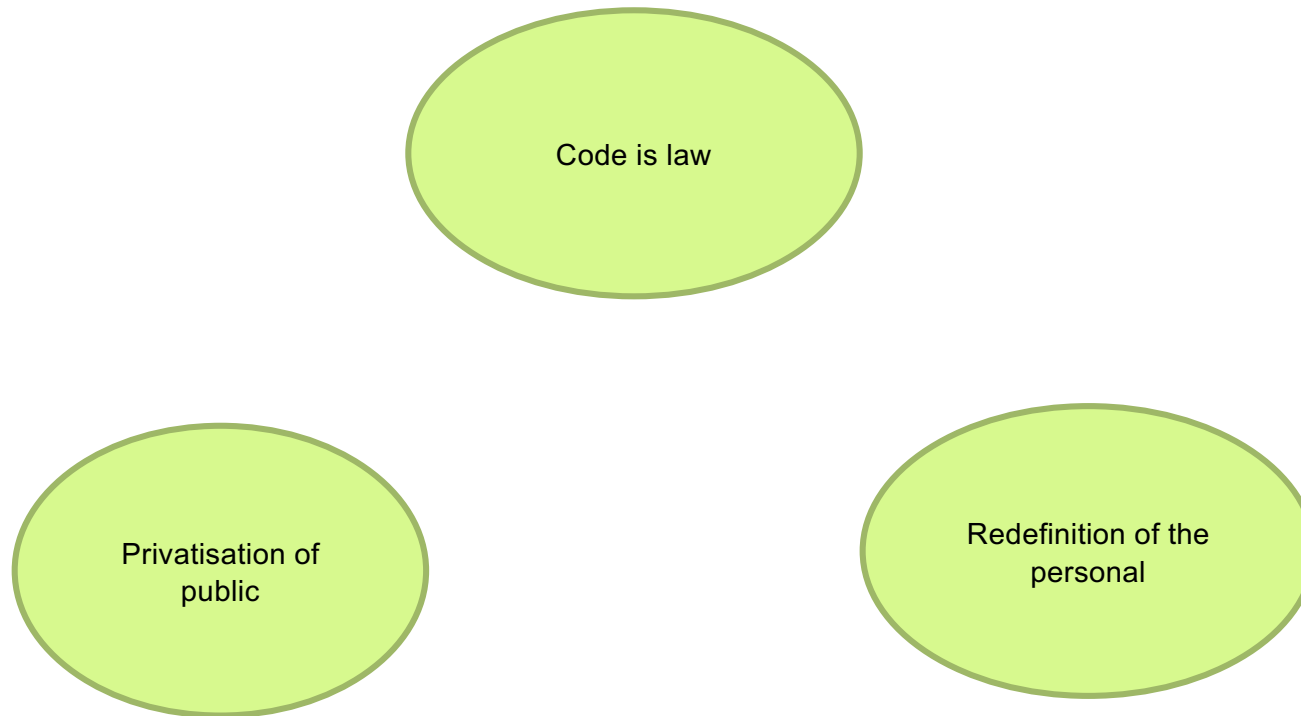
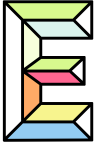
Suburbs



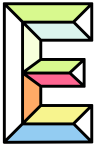




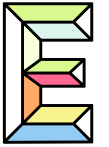
Three areas of contention around the citizen



Emerging approaches



Five domains witness shift in power



Markets

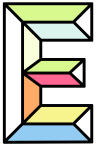
Labour

Geography

Conflict

Citizen

Potential approaches



Observability



Interoperability

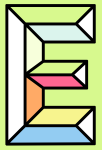


New rights



Common pools





The Exponential Age

