Revitalizing Semiconductor StartUps

Tarun Verma
Managing Partner
November 12, 2025

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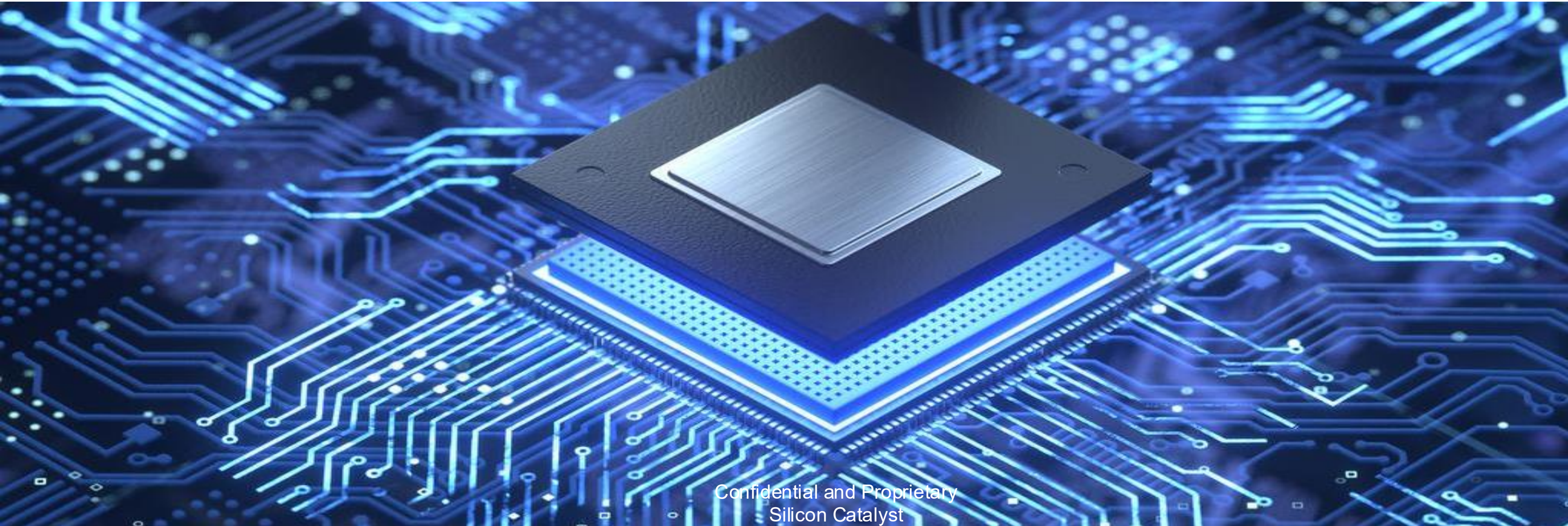

Disclaimer

The keynote contents are my personal opinion and takeaways as part of

Silicon Catalyst

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Silicon Catalyst is the only accelerator focused on

the **Global Semiconductor Industry**

including Chips, Chiplets, Materials, IP and Silicon fabrication based

Photonics, MEMS, Sensors, Life Science and Quantum

Established 2015 in Silicon Valley
Global portfolio companies (PCs) are worth > $3B
Screened over 1,500 early-stage semiconductor companies
Admitted over 150 Companies globally into our bespoke incubation programs
Established Silicon Catalyst Israel (2019), UK (2021) & EU (2024); >400 advisors worldwide; >500 partners
5G, AI / ML, UWB, IP, Comms infrastructure, Photonics, IoT, Power, Life Science, MEMS/Sensing, Materials, Quantum
Si Catalyst Angels (2019) & Si Catalyst Ventures (2024); PCs have raised > $1B in VC **+** > $200M in IKP **+** > $200M in grants

Bottom line up front (BLUF)

Semiconductors are resurgent

Company valuations and profitability
- 16 of the top 20 market caps in tech
- 3rd most profitable industry

AI is profoundly hardware limited -- it's the next gold rush

Essential assets in a geopolitical sea change away from globalism

A surge of investments are underway

CHIPS Act(s) in various countries and regions.

Rise of Sovereign Wealth Funds

VCs are wading back in as there are green shoots in Deep Tech and specialty funds – A contrarian opportunity

Reasonable M&A and IPO opportunities for startups

Chiplets and advanced packaging can advantage startups

Semiconductor startups face daunting challenges

Escalating cost of innovation: prototyping access and costs

Sustained decline of venture capital for semiconductors

Achieving product-market fit remains challenging

Diminished customer appetite to award design wins to startups

But more research will not lead to commercialization unless we continue to build the startup playbook

Aggressively implement CHIPS Act investments across the globe for prototyping and startup funds with a sense of urgency

Supplement with existing government programs and funding streams

Strengthen startup ecosystem for translation to industry

State of Semiconductors in 2025

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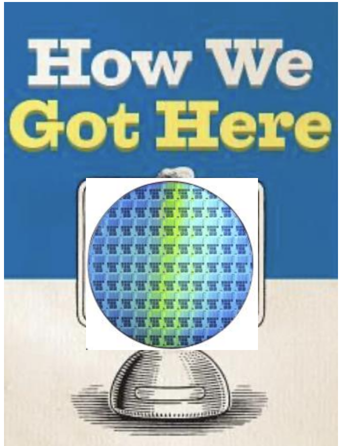

Forces shaping evolution

- System firms become silicon houses
- Domain specific architectures
- AI and data center buildout
- Chiplets and advanced packaging
- China
- CHIPS Act

How did we get here?

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1950's – Invention of the transistor by Bell Labs and dissemination through licensing core technology

1960's – Integrated circuits driven by gov't needs, invention of venture capital and startups in Silicon Valley

1970's – Invention of microprocessors and DRAM memory

1980's – Japanese DRAM threat leads to formation of SIA / SRC / SEMATECH to restore US competitiveness

1990's – Foundry business model lead by TSMC in Taiwan

2000's – Beginning of industry consolidation; decline in venture capital investment

2010's – Moore's Law slowdown, the rise of AI, and emergence of a Chinese threat, pricing power

2020's – Pandemic chips shortages, CHIPS Act(s), China's access restrictions, Generative AI

Historical Evolution

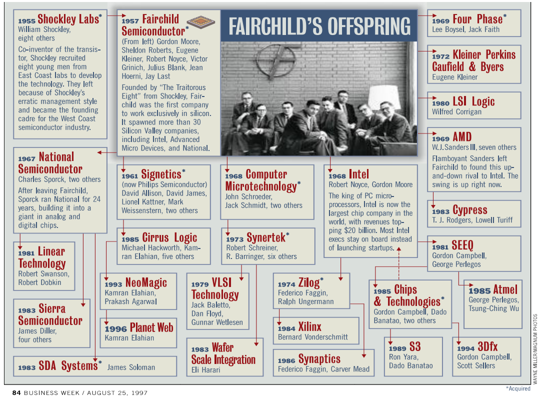
Government

Early 'Risk' Capital

ARDC & DGA

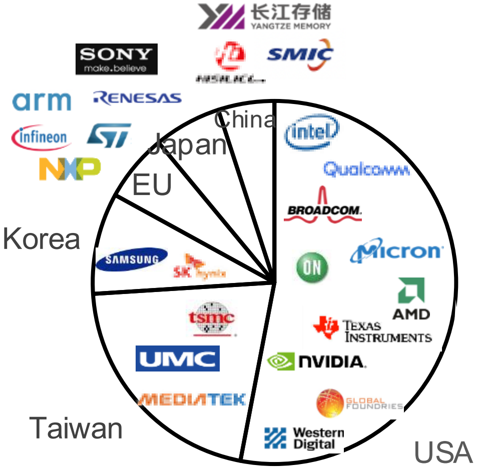
1940-50's

Venture Capital & StartUps



1960-80's

Geographic Dispersion & Consolidation



1990-2020's

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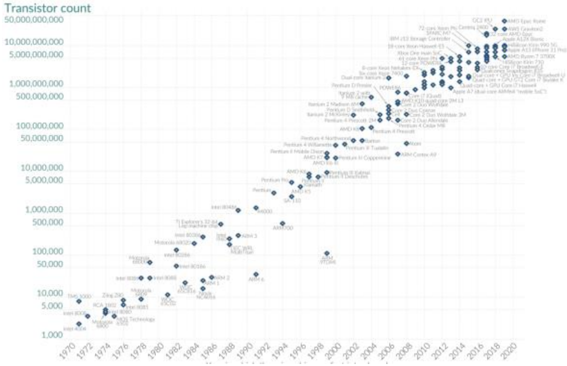
Virtuous Cycle of Moore's law

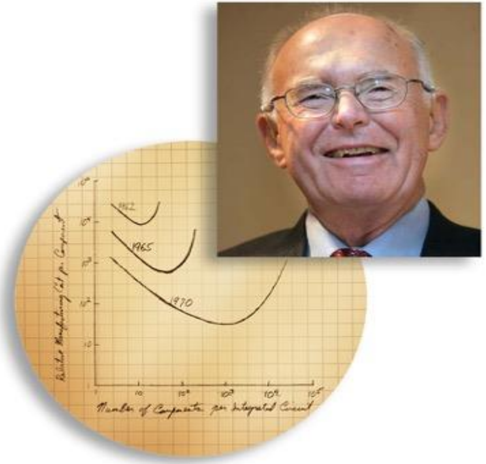
Transistors on a Chip



Wikipedia

More R&D
(innovation)

Lower
cost/function

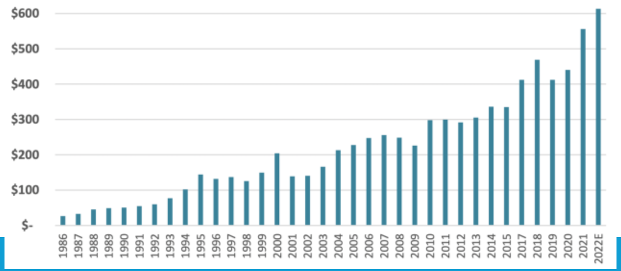


$'s

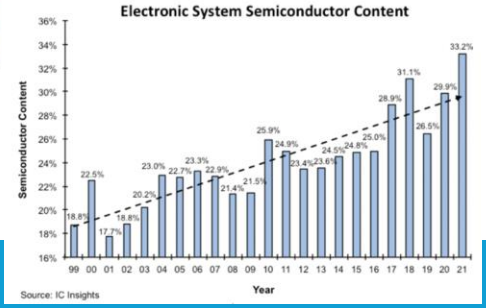
Increasing
semiconductor
revenue

Expanding
applications
(more silicon)

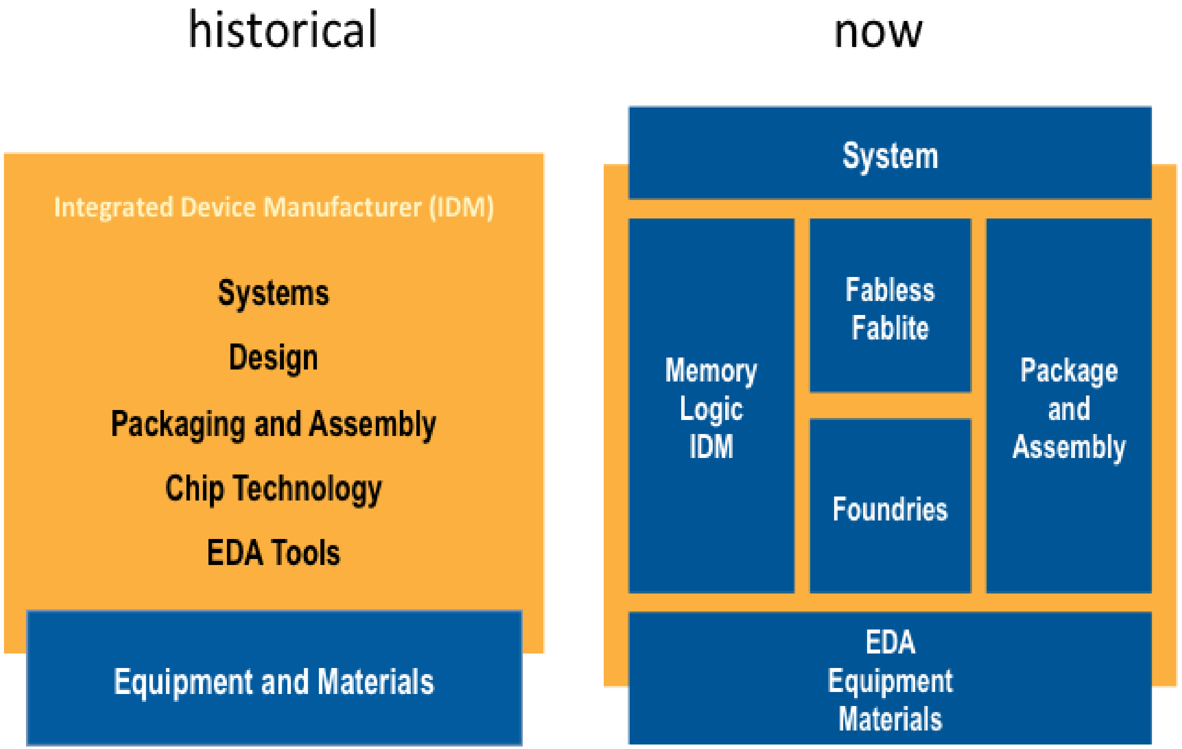
Semiconductor Revenue



WSTS



Evolution of the supply chain and it's fragmentation



Forces shaping future industry evolution

System firms become silicon houses

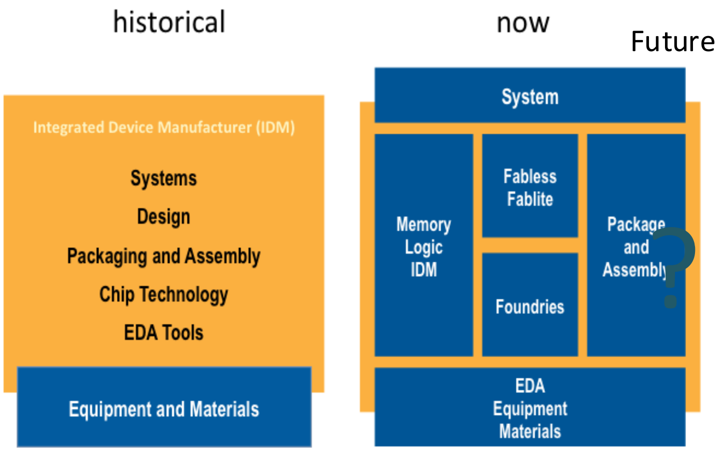
Domain specific architectures

AI and data center buildout

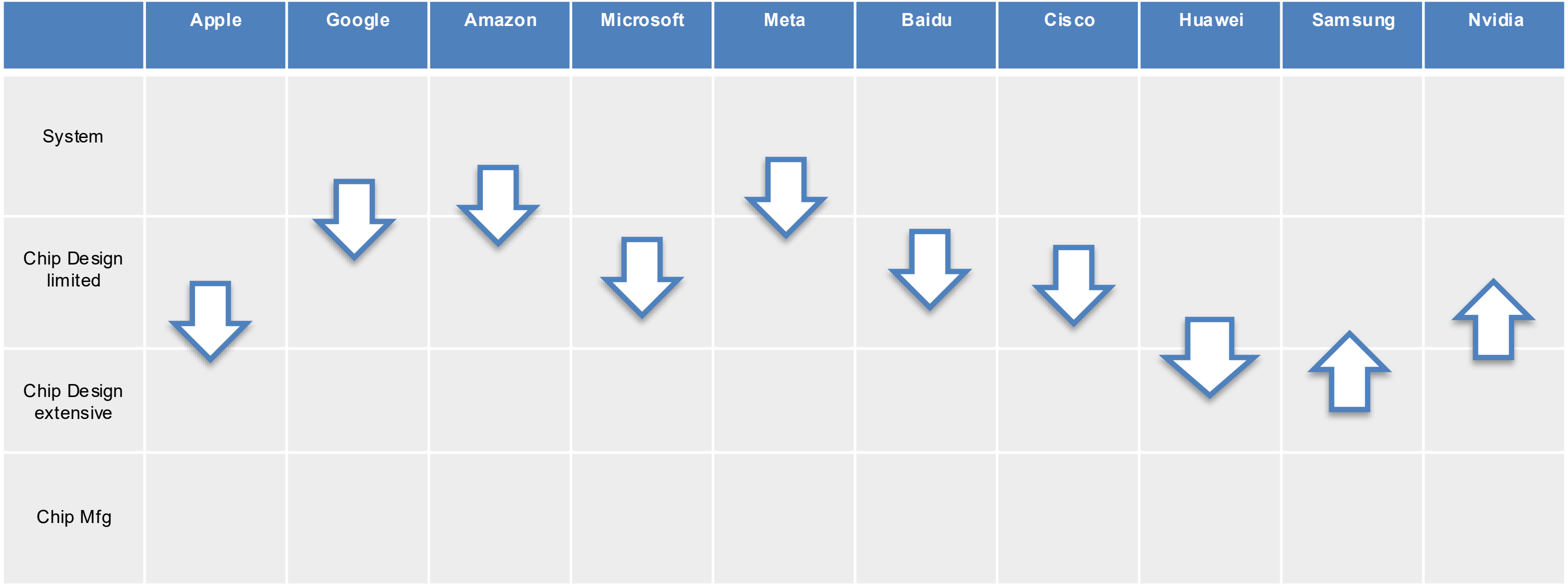
Chiplets and advanced packaging

Sovereign Wealth Funds

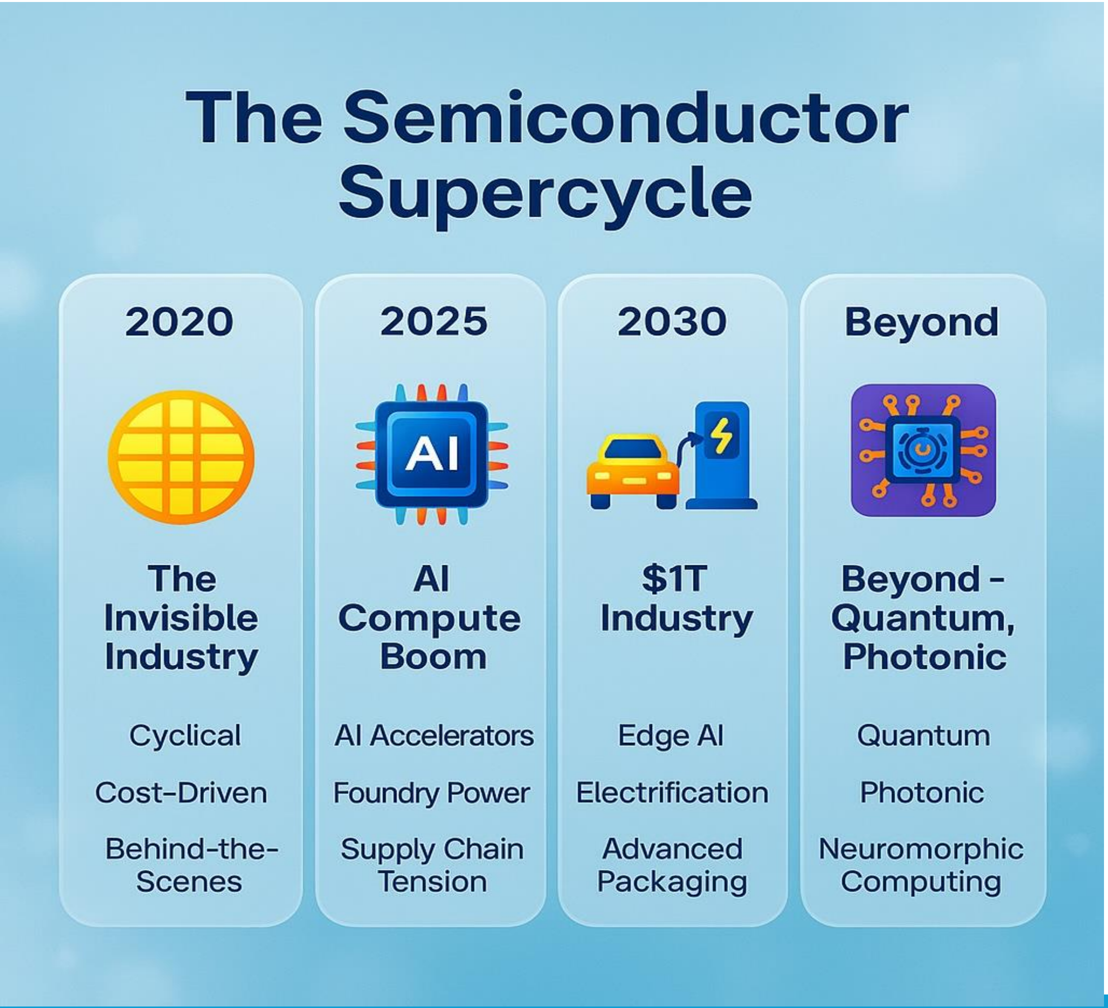
CHIPS Act



System companies becoming silicon houses



VLSI Research (modified)



Still subject to the classic semiconductor boom/bust constraints

The Five-Year Shift (2020 → 2025)

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- **The AI Compute Boom**
  - Generative AI pushing chipmakers to the center of the tech economy.
- **Supply Chain & Geopolitics**
  - Owning silicon capacity implies owning economic resilience
- **The Sovereignty Push**
  - Chips are now instruments of national power
  - Rise of Sovereign Wealth Funds
- **Rise of System Houses**
  - Expanding In house chip design

What’s Next (2026 → 2030)

- Industry is on track to exceed $1 trillion in annual revenue by 2030
  - Driven by AI, electrification, advanced packaging and edge computing.
- Edge AI Everywhere
  - Efficient NPUs will move AI from the cloud to devices
  - Wearables, Phones, Robots, IoTs, Drones, etc.
- Electrification & Energy
  - EVs and smart grids are accelerating demand for SiC and GaN power chips.
- Packaging Bottleneck
  - Performance now hinges on chiplets, 3D stacking, and HBM
  - Advanced packaging capacity will be a new battleground.

Beyond 2030: The Quantum & Photonic Horizon

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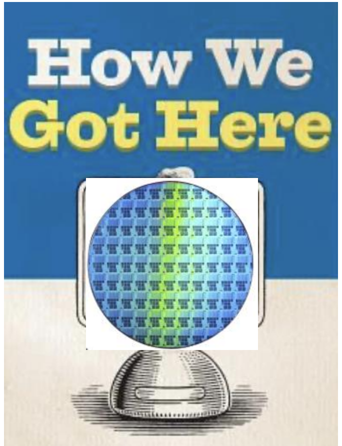
- Quantum, Photonic and Neuromorphic chips will bring massive leaps in speed and energy efficiency,
  - Reshape how AI, computing, and communication systems are built.
  - Early days

State of semiconductors in 2025



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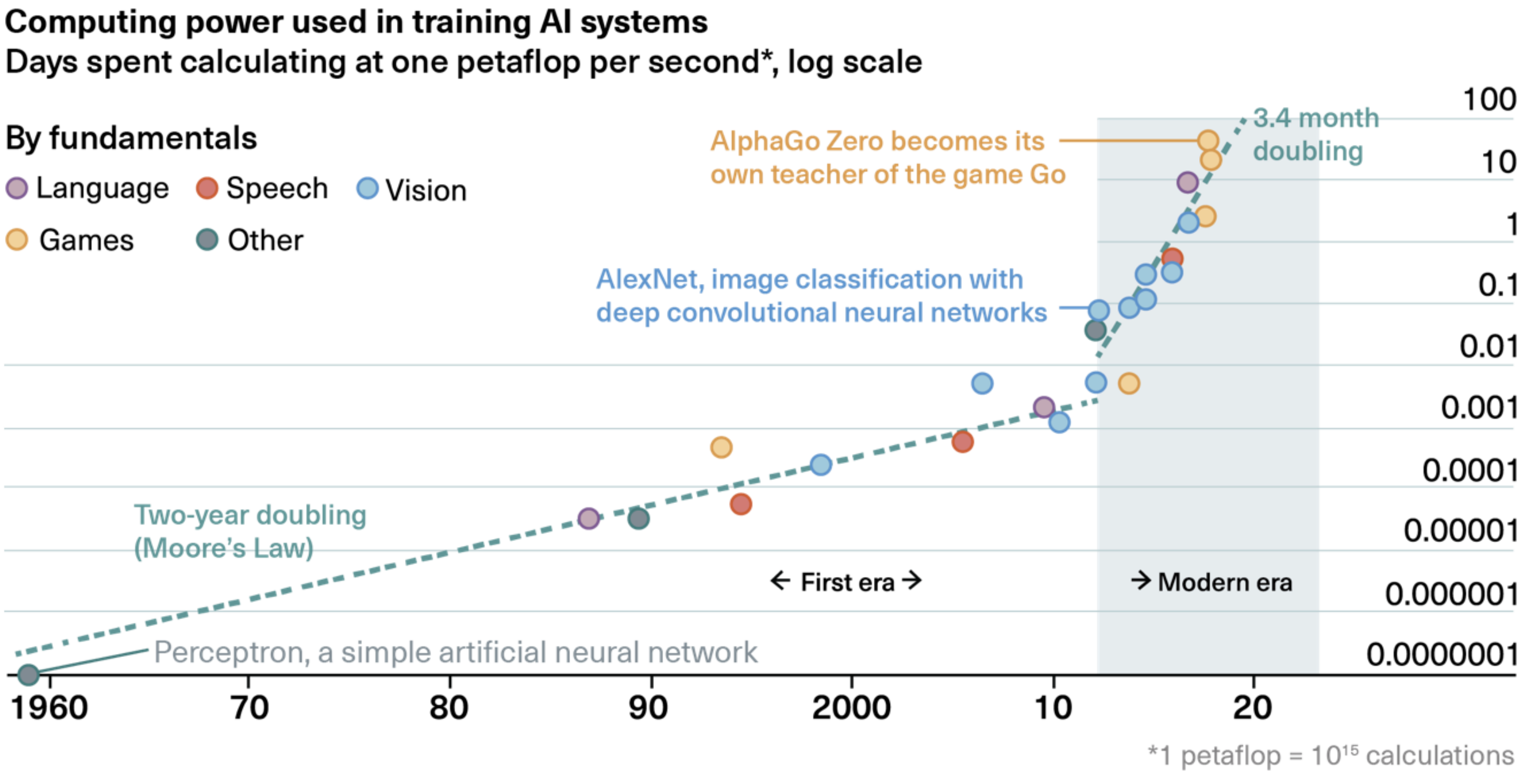
AI scaling into a new exponential for compute requirements



The Economist

Acceleration of AI with GPUs

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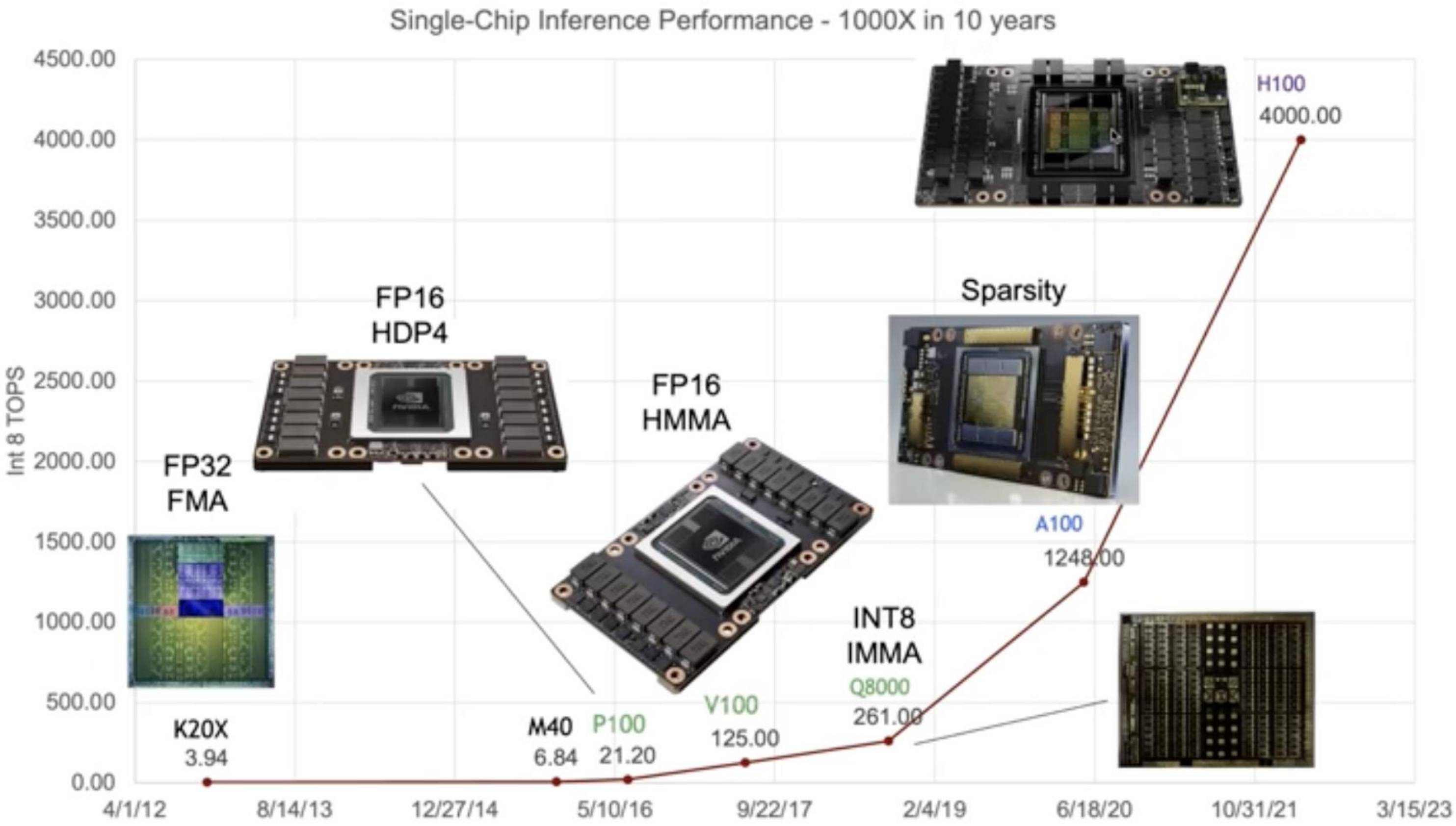
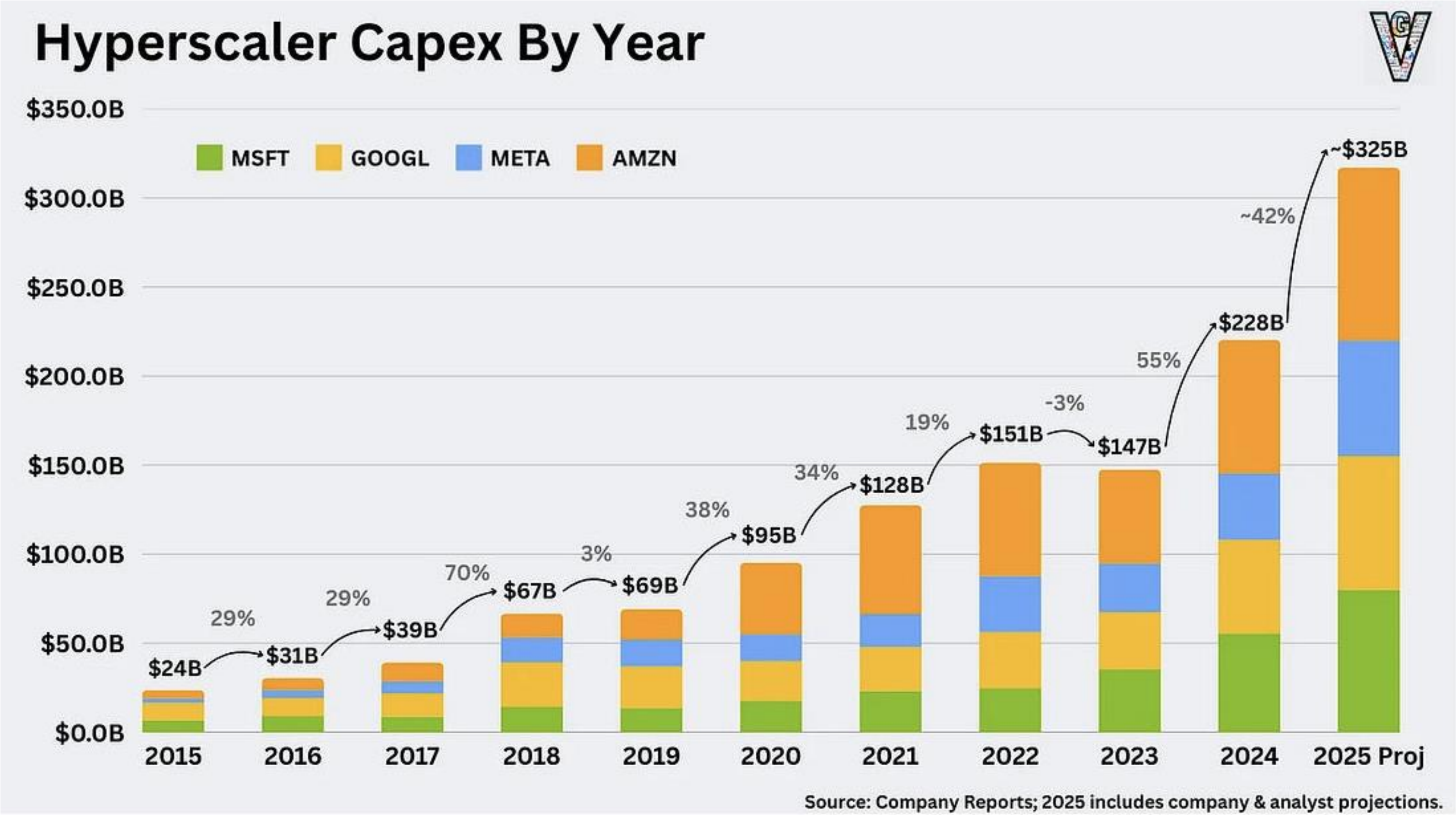
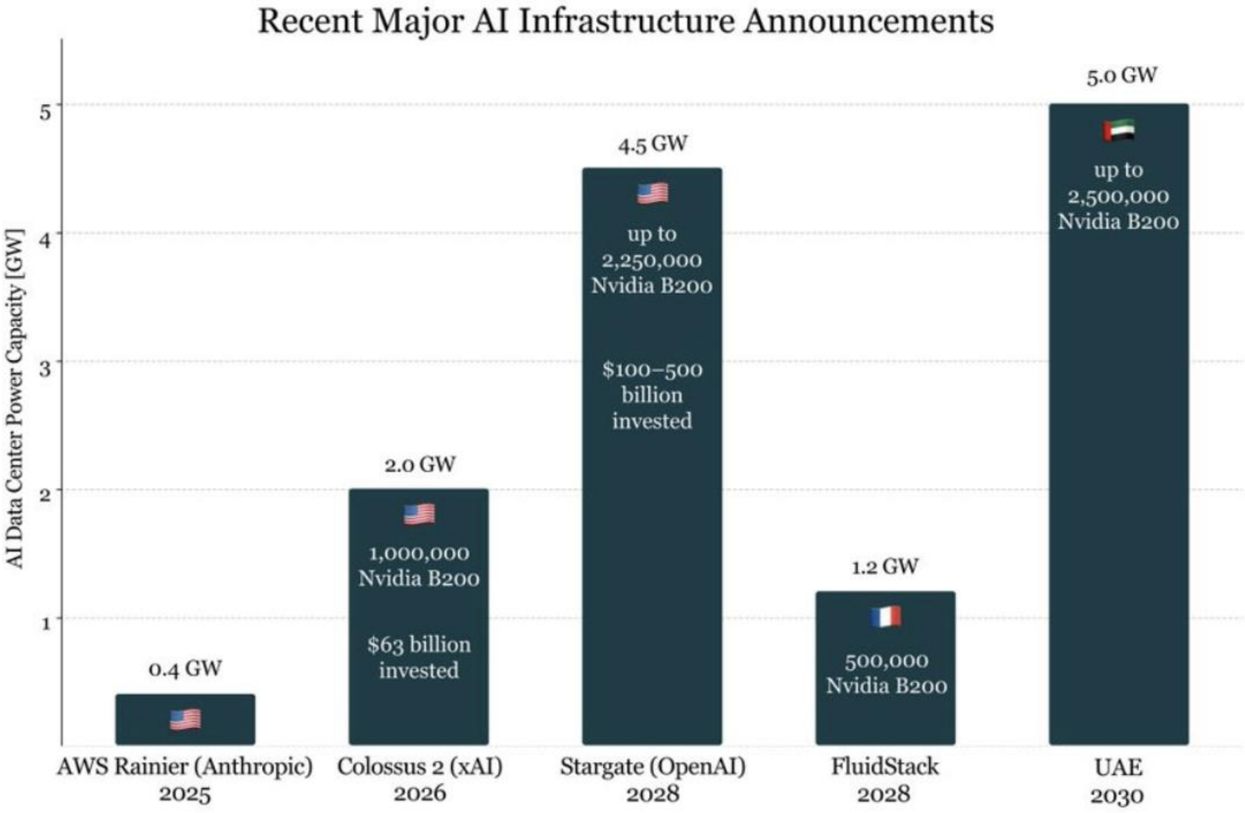


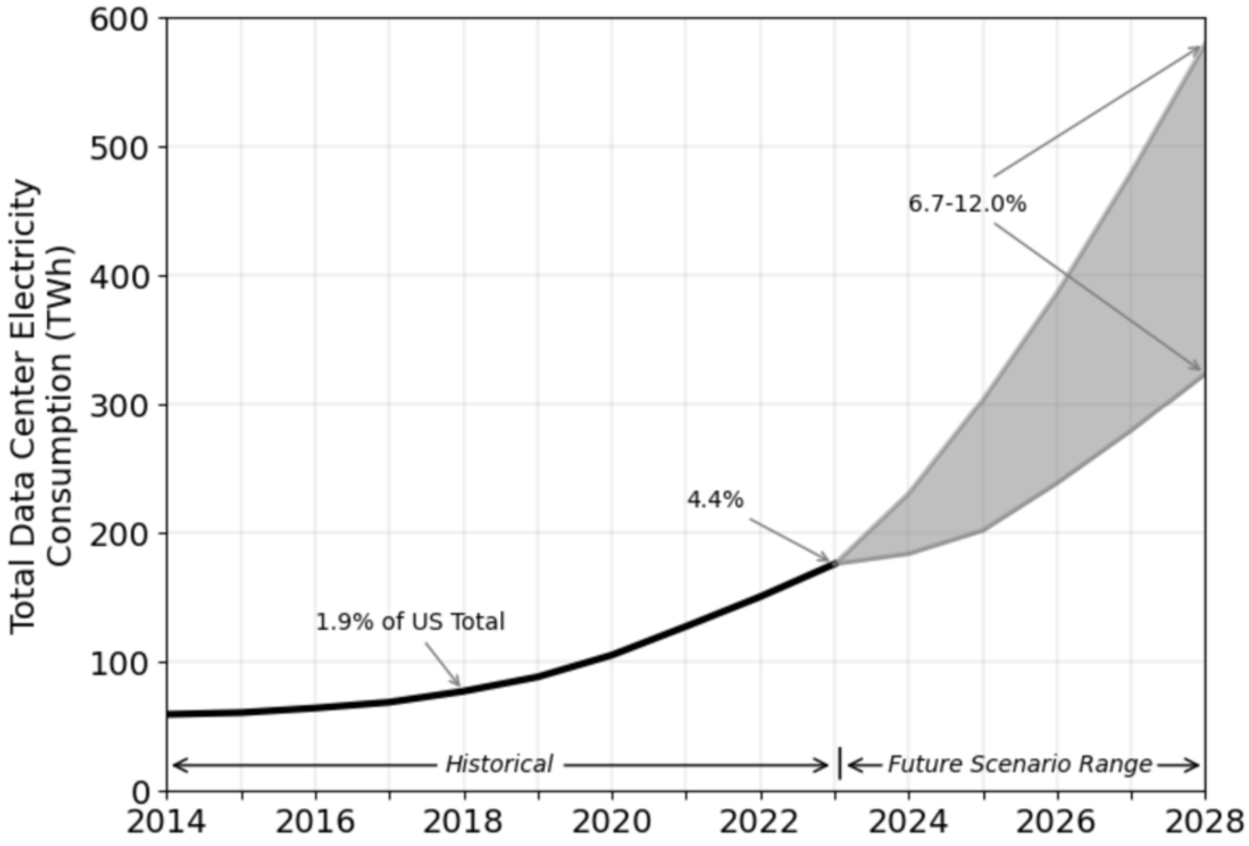
Hyperscaler CapEx investments for cloud data centers



AI data center investments



U.S. power consumption from data centers



DOE-LBNL

Forces shaping future industry evolution

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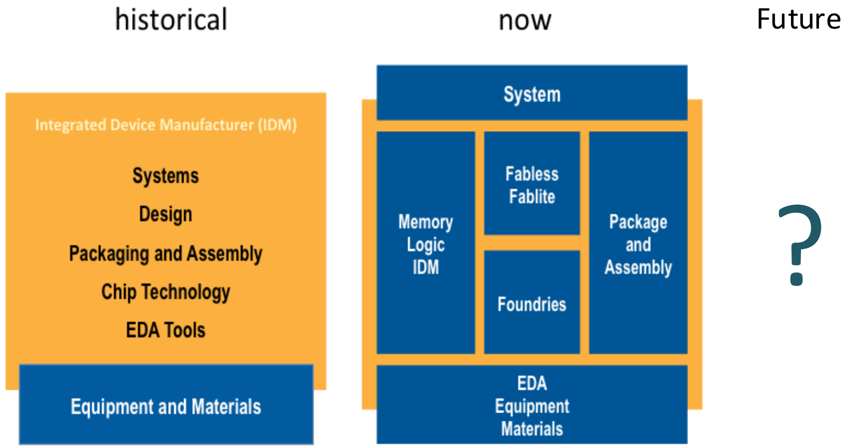
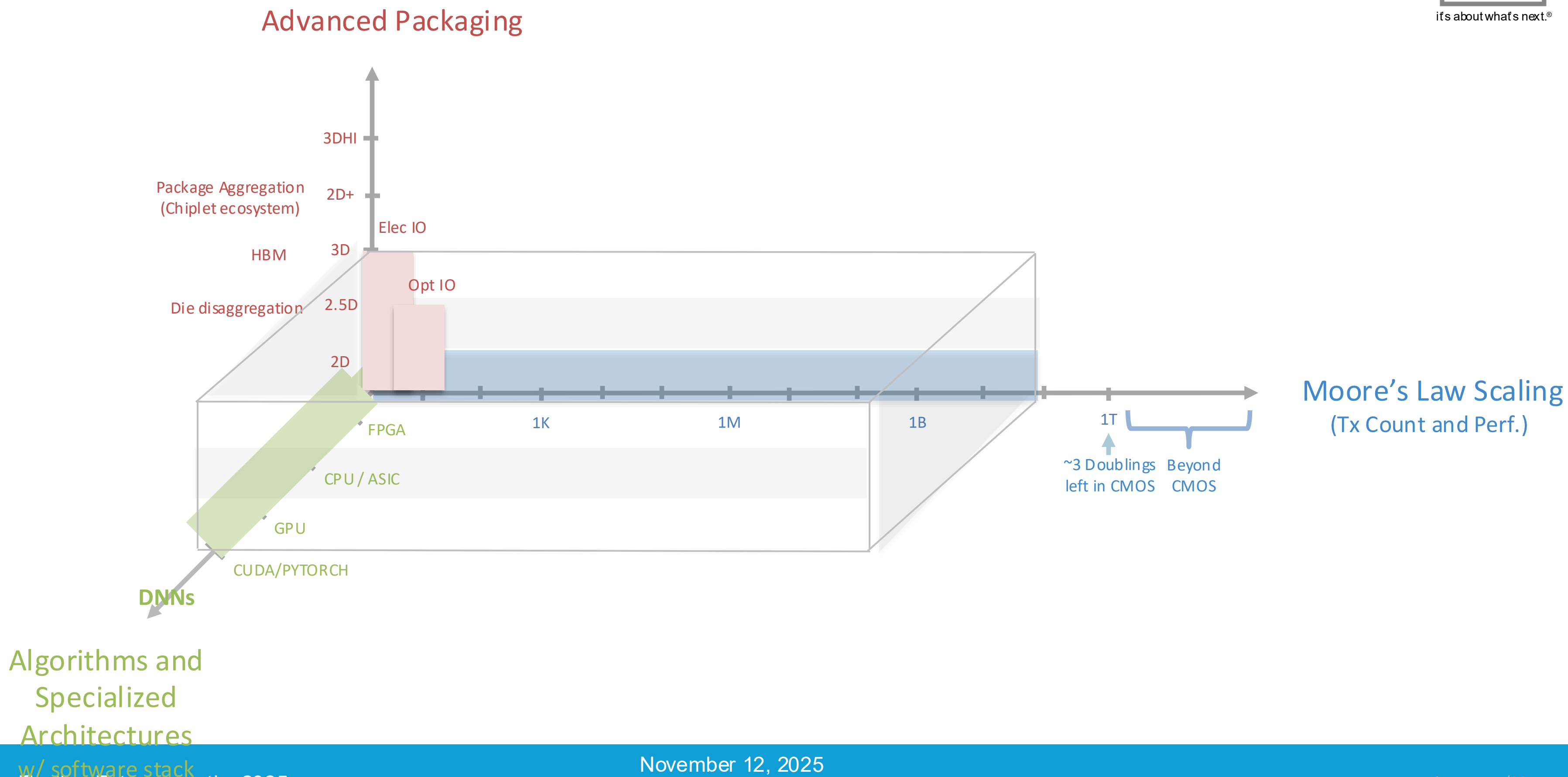


Expanding the computing volume



Chiplets and heterogeneous integration

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Why now?

Yield loss from reticle size die

Optimize intended function to best technology node

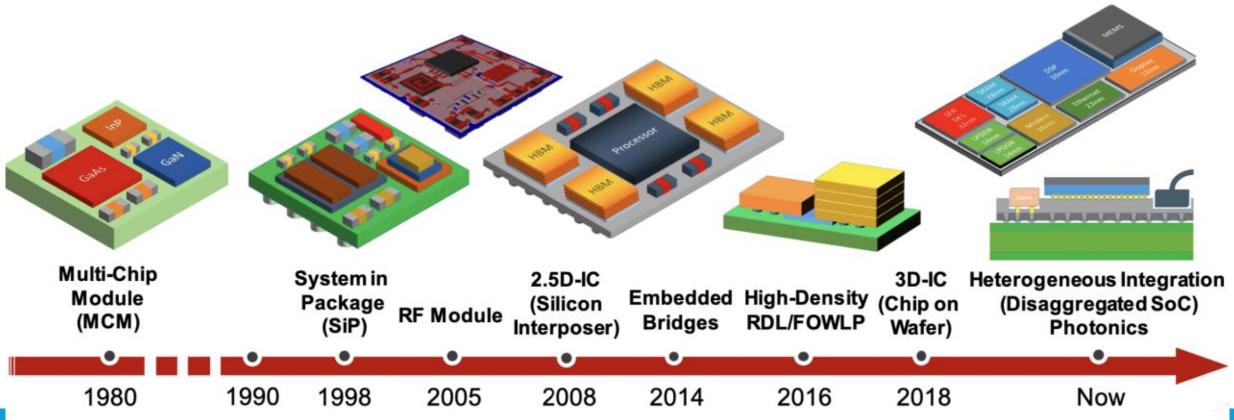
It works: Xilinx FPGA, AMD CPUs, Intel, DARPA CHIPS

Challenges

Chip to chip interfaces: AIB or BoW or UCIe

Business model: KGD

Marketplace of available chiplets



TSMC packaging roadmap

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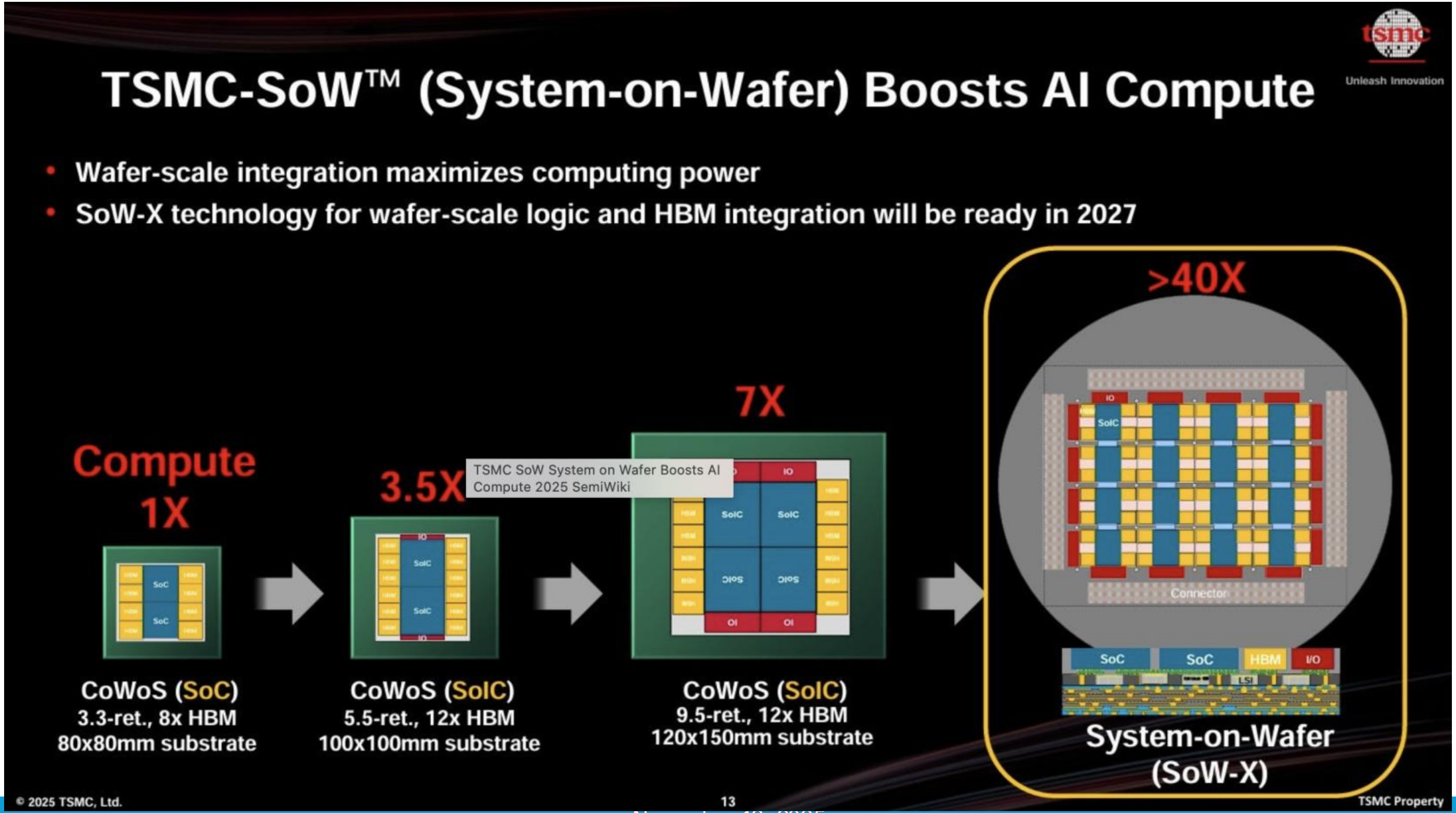

State of semiconductors in 2025

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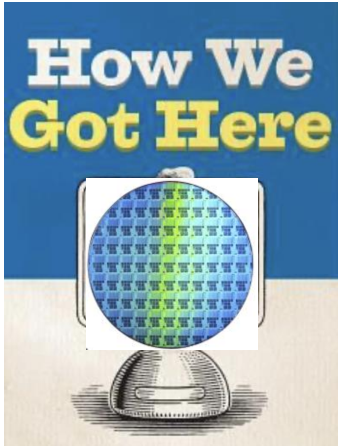

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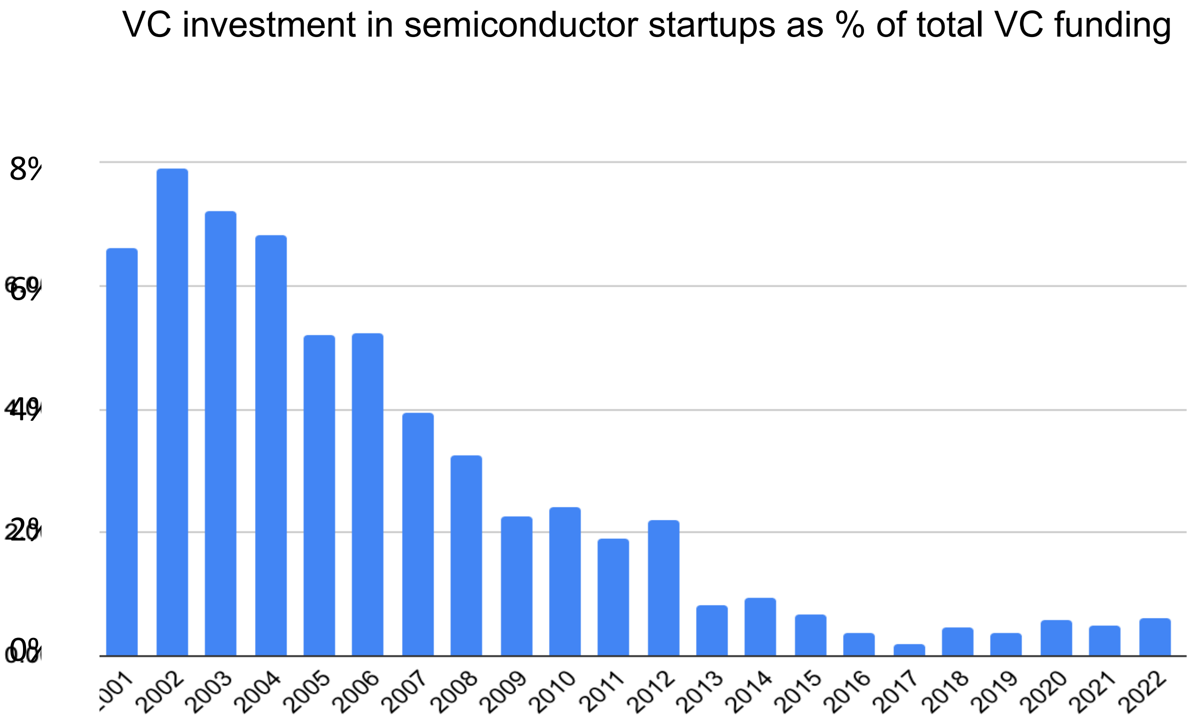
Venture Capital has moved past semiconductors to software and services



Pear Ventures & Crunch base

Typical semiconductor startup timeline

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Year	0	2	4	6	8	10
Funding Round	Pre-seed	Seed	Series A	Series B	Series C …	IPO or M&A
Funding Source	Self / F&F Angels Grants (SBIR …) NSF, DOD, DOE, DARPA	Angels VC and CVC Grants (SBIR…) NSF, DOD, DOE, DARPA	VC and CVC Grants (SBIR …) NSF, DOD, DOE, DARPA	VC and CVC	VC and CVC Growth VC	IPO or SPAC Corp M&A
<u>Fund raise ($M)</u>						
Low	0.5	1	5	20	30	100
Medium	1-2	2-5	10-20	30-70	50-100	200-300
High	2	15	100	150	150	500

VC model at a glance

Goal is return 3-5x or 20-30% annual IRR over the 10-year life of the fund

Invest fund in 20-25 companies which represent 0.1-1% of deal flow

Hits driven business – need 1-3 companies to return 10-100x of investment

VCs are compensated 2% of fund annually for OpEx and retain 20% (carry) of profits

Each startup funding round is lead by a new VC that sets the valuation and investing terms for others, and for existing investors, exercising pro-rata rights is key

VCs raise follow-up funds based upon track record of the prior fund

VC model dictates where investments are made and why semiconductors struggle

Investments in semiconductors are less attractive compared to software and services

- Higher capital required
- Longer time to revenue ramp
- Higher innovation failure rates
- Longer time to liquidity
- Lower returns

Semiconductors requires extensive and specific due diligence, a skill mostly atrophied

Product-market fit is hard to predict based upon early measures of traction and adoption

Dramatic ramp of venture investment in the last decade – semis not benefiting

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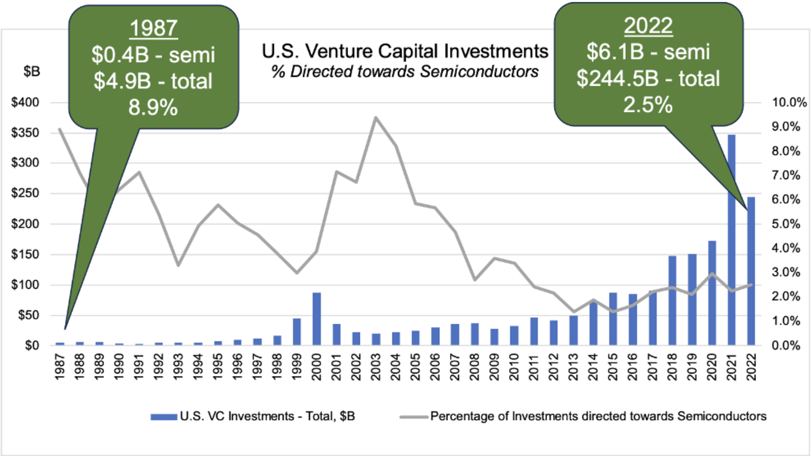
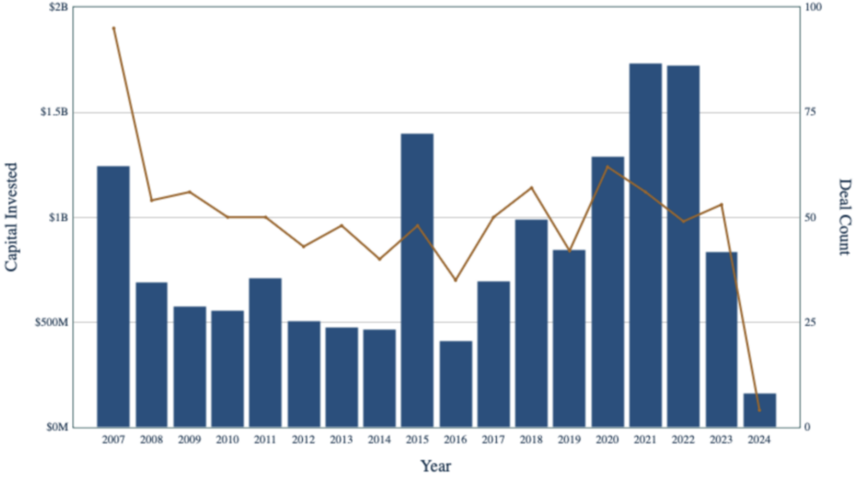
US VC investments (25 years)



Sources: 1987-1996 Data (Total, Semi): NSF, Venture Economics Investor Services, October 1998; 1997-2003 Data (Total, Semi): NSF, Dow Jones VentureSource, 2014; 2004-2022 Data (Total): National Venture Capital Associations (NVCA); Pitchbook, 2023; 2004-2022 Data (Semi): Pitchbook, Deloitte, December 2021

CHIPS IAC Organization/PPP Working Group November 8, 2023 Public Meeting

US VC investments in semiconductors (15 years)



Pitchbook

Venture Capital and Corporate VC: major players in semiconductors?

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VC by Deal Count

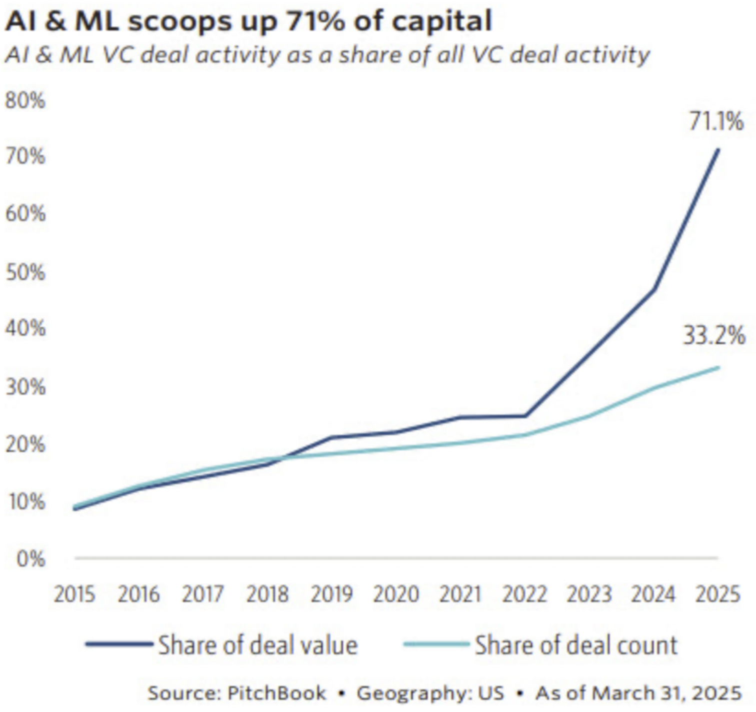
Celesta	26
Walden International	24
A&E Investments	23
Eclipse Ventures	15
Foothill Ventures	15
Sutter Hill Ventures	15
Alumni Ventures	13
GSR Ventures	12
InQTel	12
Cambium	10
DCVC	10
Foundation Capital	10
Kleiner Perkins	10
Lux Capital	10
Bessemer Ventures	9

CVC by Deal Count

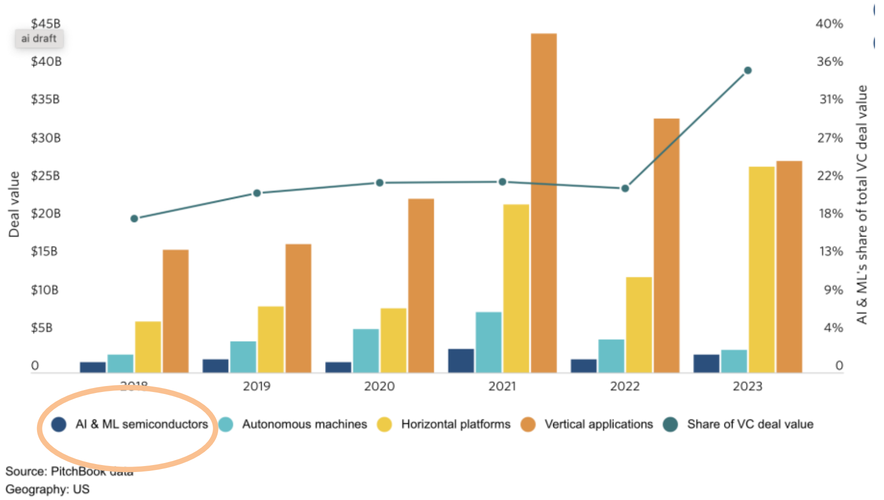
Intel Capital	74
Applied Ventures	16
Samsung Catalyst Fund	16
TEL Venture Capital	11
Cisco Investments	10
Lockheed Martin Ventures	10
AMD Ventures	9
Dell Tech Capital	9
Western Digital Capital	7
M12	6
Xilinx Ventures	6
TDK Ventures	5
3M Ventures	4
Airbus Ventures	4
Eni Next	4

Pitchbook, 2014-2024

AI share of Venture Capital

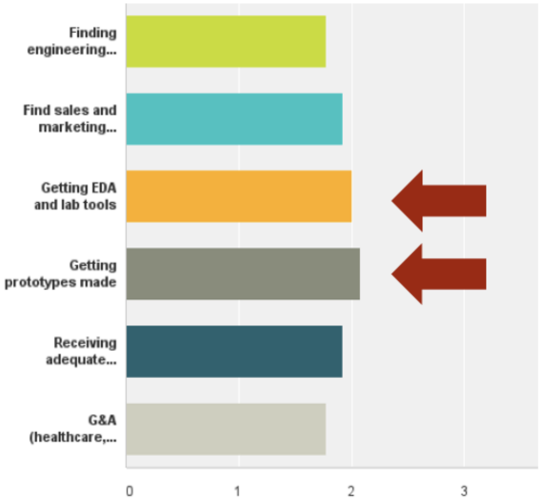


AI funding by sector



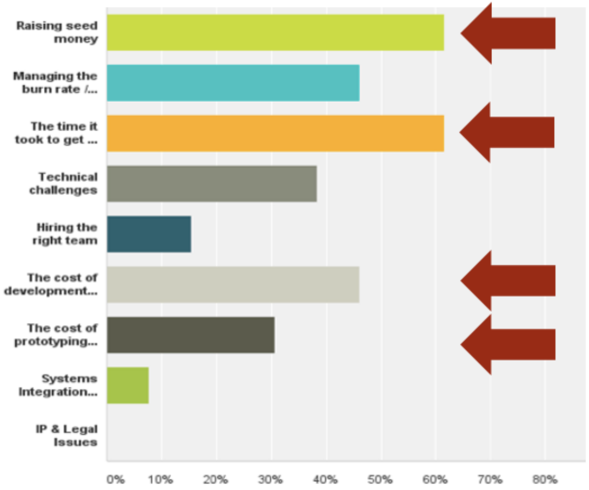
Challenges facing semiconductor startups

Rank Issues



Rank Expenses

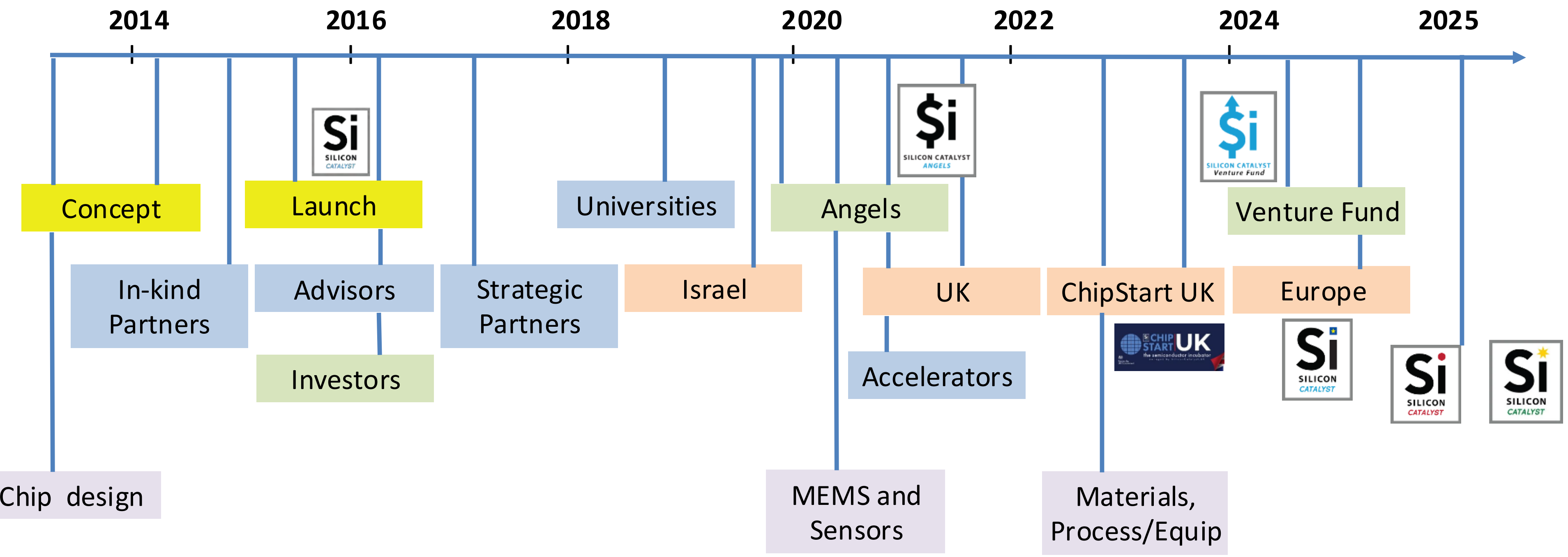
Top Challenges



Time, EDA, Prototypes, Test, $'s

Source: 70 startups surveyed in 2014 & > 500 startups 2015 – 2023

Silicon Catalyst timeline



Ecosystem Centered on Startups

PCAST Semi
DoC IAC
CA CHIPS Co.
N-W AI Hub

Management Services

Architecture, Design Review
Go-to-Market, Supply Chain

Industry Partners

70+ In-Kind Partners

400+ Advisors

450+ Investors

Strategic Partners

35+ Universities

Accelerators

Good for Startups, Partners, Investors, Advisors … the industry

Silicon Catalyst Track -Emerging Hardware Technologies and Startups

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11:30–11:40 *Introduction to Silicon Catalyst*
Tarun Verma, Managing Partner
https://www.linkedin.com/in/tarunverma01/

11:40 – 12:00 *Emerging Trends in AI for Chip Design and EDA*
David Pan, UT Austin and SC Advisor
https://www.linkedin.com/in/davidzpan/

12:00–12:15 *Ultra-Fast AI Inference at the Edge*
Frank Thiel, SC Advisor and CTO of GIgantor (https://gigantor.com)
https://www.linkedin.com/in/frank-thiel/

12:15 –12:30 *New Sensing Technologies Provide Insight Inside Batteries*
Rick Seger, SVP, SigmaSense (https://sigmasense.com)
https://www.linkedin.com/in/rickseger

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Follow up

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