Seasonal School on Advanced Analog and Mixed-Signal (AMS) IC Design 2025

Powered by POEMS - Microelectronics Academy

June 12 - July 31

7 weeks
9h30 – 17h30

Technical Sponsors:

UNINOVA Instituto de Desenvolvimento de Novas Tecnologias

NOVA SCHOOL OF SCIENCE & TECHNOLOGY

POEMS Portuguese Competence Centre in Semiconductors

CTS

IEEE PORTUGAL SECTION

fct Fundação para a Ciência e a Tecnologia

BTS IEEE Broadcast Technology Society

CAS

IEEE CTSoc CONSUMER TECHNOLOGY SOCIETY

SSCS IEEE SOLID-STATE CIRCUITS SOCIETY

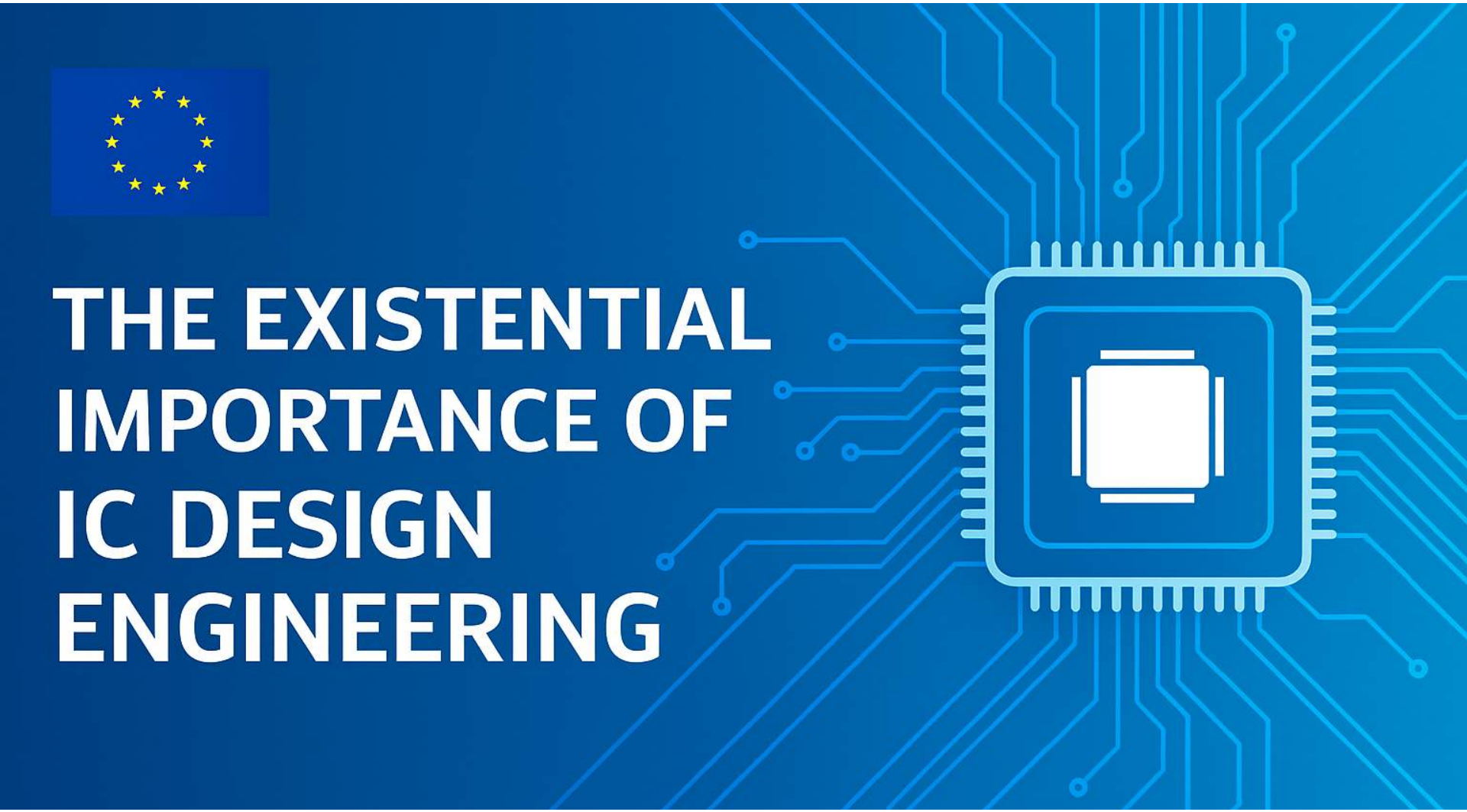
SYNOPSYS®

Santander X By Santander

Funded by the European Union

It is all about People

Professor João GOES


THE EXISTENTIAL
IMPORTANCE OF
IC DESIGN
ENGINEERING

Why We Are Here

- "This is not just a course... it is a movement."
- With a Mission to inspire, educate, empower next-gen AMS engineers.
- A gathering of bright minds and future innovators.
- An European initiative to deepen AMS design excellence.
- An opportunity to build, connect, and lead.
- It was designed for 50, today we are 80, tomorrow we will be hundreds.

This is about the
IC Design Talent Imperative

The World runs on Silicon

- Healthcare
- Energy
- Home
- Aerospace
- Defense
- Mobility
- Communication
- IoT
- AI
- ...

Strategic Sovereignty Semiconductor Dependence

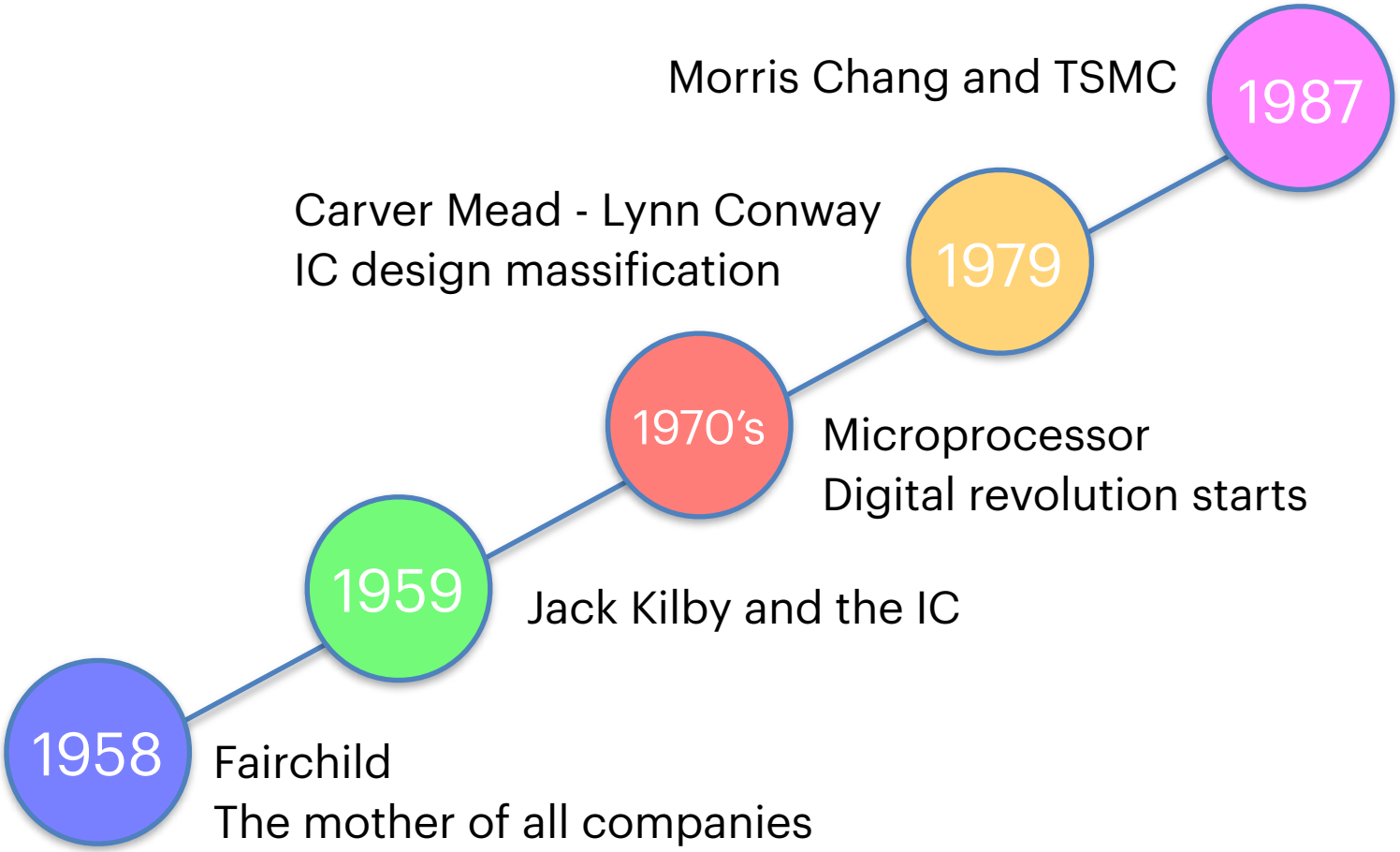
- The chip shortage revealed how fragile global supply chains are.
- Nations are investing in on-shore and near-shore capabilities.
- Design talent is not just a technical field; it is now geopolitical.

Secure access to IC Design Expertise

=

Strategic Autonomy!

A Bit of History



A Bit of History

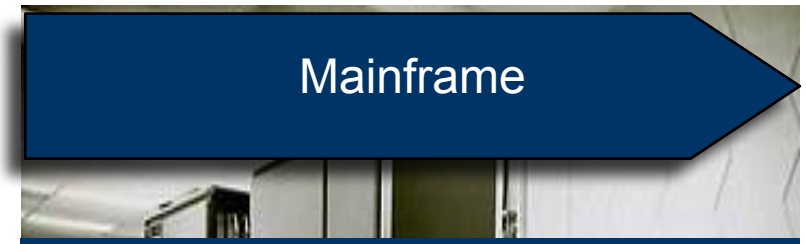
Figure 1.1
Fairchild Semiconductor's founders, circa 1960. Collection of Christophe Lécuyer.

Jack Kilby at Texas Instruments was one of the inventors of the IC,
but Fairchild Semiconductor in Silicon Valley was the “mother of all companies”

Drivers & Trends

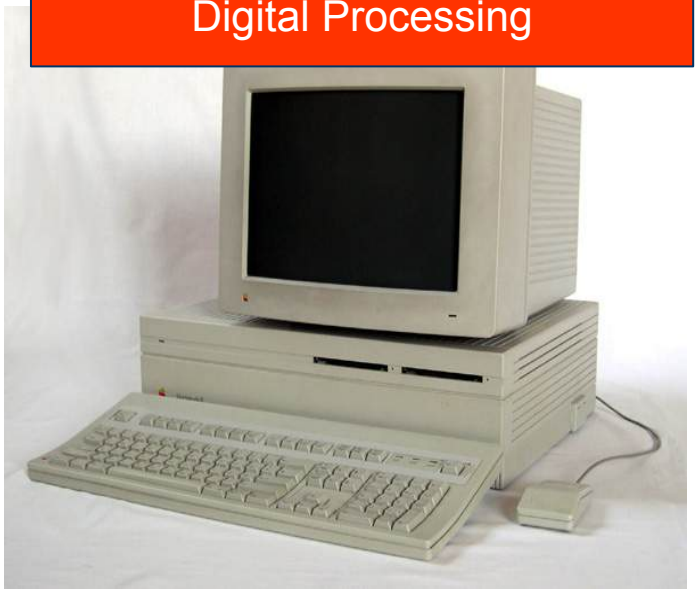
Mainframe

PC



Data processing

Digital Processing



Military & Space Programs

Digital Revolution Starts

1960's 1970's 1980 1990

Drivers & Trends

Consumer Things

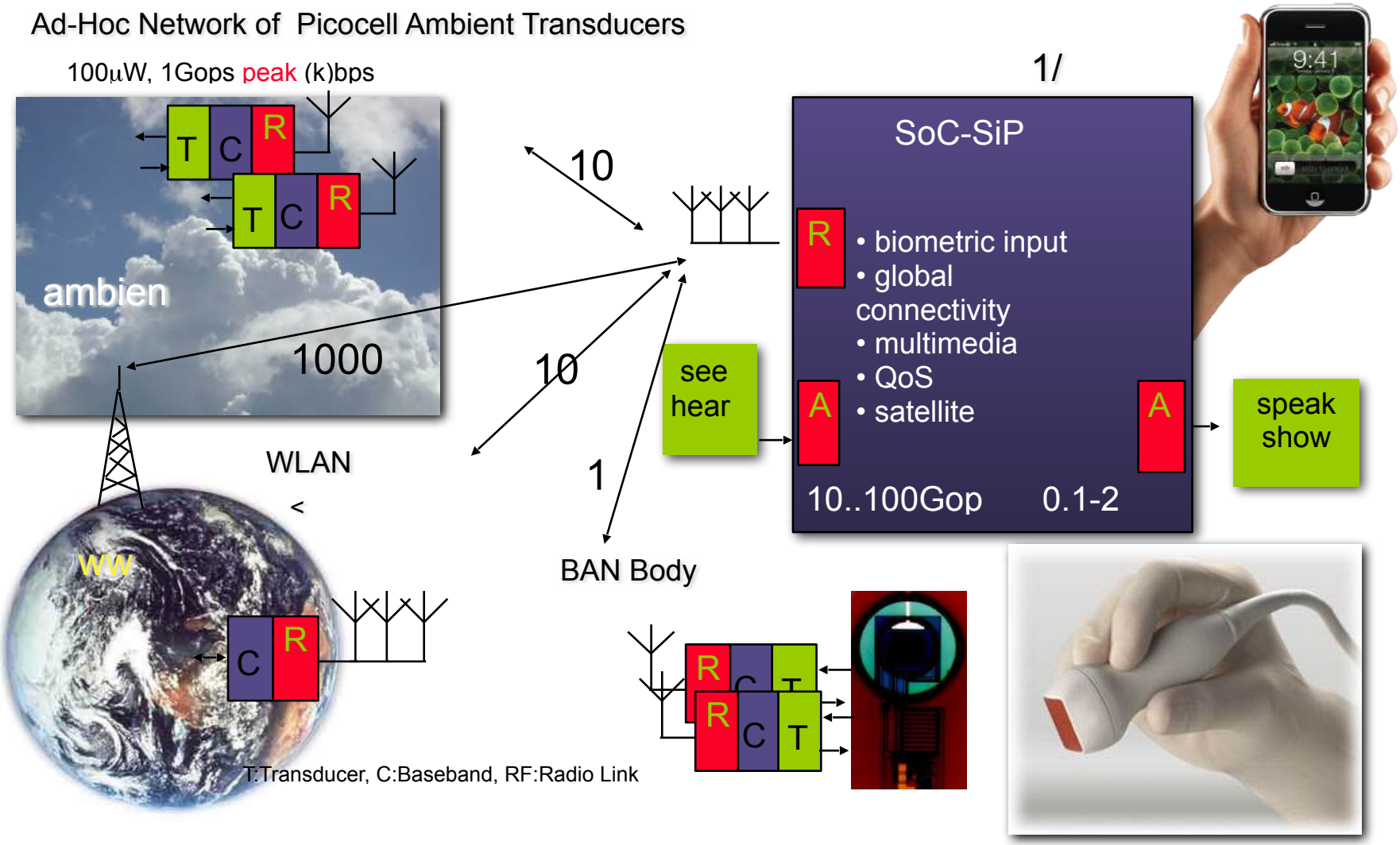
+ Connect + Network + People

Globalization

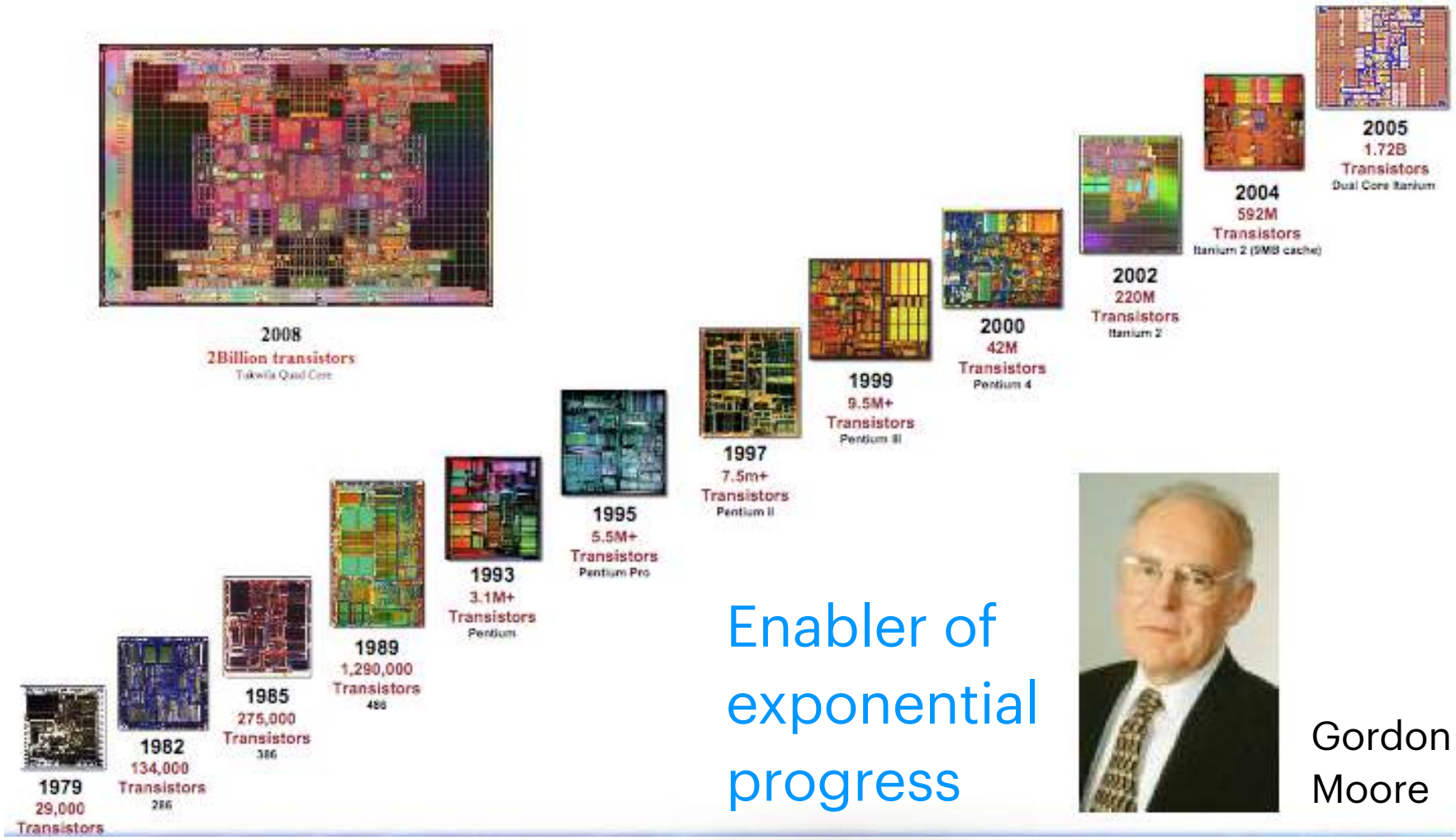
"Get Connected"

2000 2010

Drivers & Trends



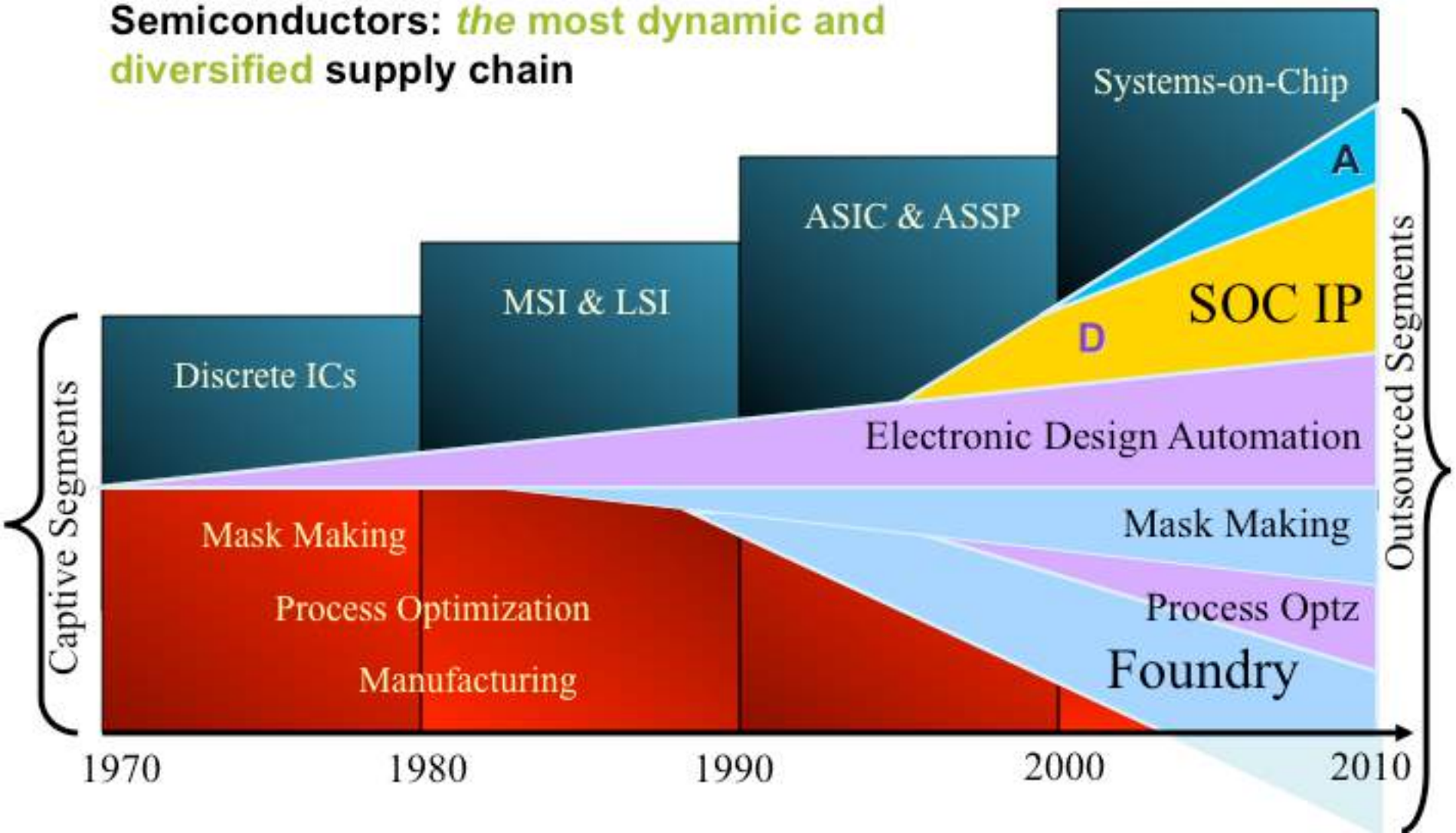
A Bit of History



Enabler of exponential progress

Gordon Moore

A Bit of History



The Silent Power of Analog

- Analog and mixed-signal (AMS) design connects physical reality to digital computation.
- Sensors convert sound, temperature, pressure, motion, into signals.
- AMS circuits enable precise data acquisition, power management, and communication.
- Every digital system begins and ends in the analog world.

AMS is the Foundation of All Systems

AMS in the Chip Supply Chain

- AMS design is often the bottleneck in complex systems
- They are critical for power, speed, and accuracy
- Custom analog blocks are time-consuming to verify

AMS Design Talent
multiplies system value

A Generational Moment

- You are entering at a moment of deep, accelerated transformation.
- AMS is complex, interdisciplinary, and intellectually rich.
- Your training gives you the power to shape industries.
- The future of devices that are the world foundation — all depend on you.

Your Existential Importance

- No IC Design engineers = No chips
- No chips = No progress
- No progress = Stagnation

You can be the Generation that designs with purpose.

Europe’s Context

- Europe Chips Act, billions of euros to build (and sustain) semiconductor leadership
- 20,000 AMS engineers needed

Europe’s Context

- Europe has the talent, the universities, and the values to lead.
- Shift from chip consumption to chip creation.
- Leverage academic excellence and build local ecosystems.
- Embed design capacity into the fabric of European innovation.

Portugal’s role in the Global Map

- A vibrant academic and startup ecosystem is emerging.
- Home to talent, creativity, and resilience.
- Opportunities to lead in niche, high-value areas.
- Design leadership can grow from here.

Portugal's Microelectronics DNA

- 30+ years of AMS design excellence
- Chipidea legacy, multinationals, universities

A Personal Note

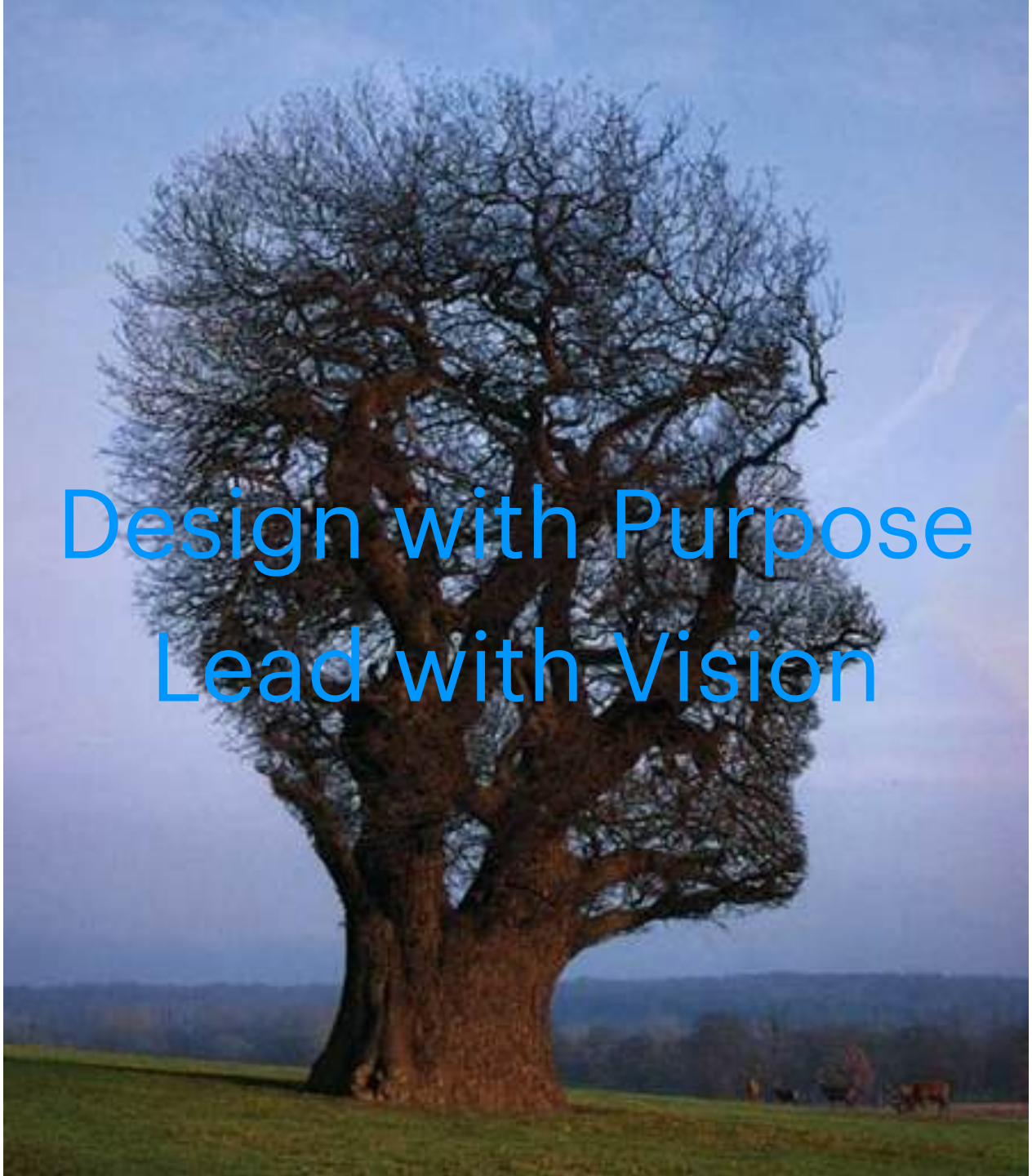
- Chipidea’s story shows what is possible.
- From Lisbon to global IP leadership.
- Became part of Synopsys, scaling design excellence.
- Built with a purpose, with talent, and long-term thinking.
- It started with belief. It continues with you.

Vision 2035

- Portugal: c. 2,000 IC Design engineers
- Thriving AMS ecosystem
- Relevant in Europe
- Competitive in the World

Dare to Dream and to Do

- ★ This School is not just a course — it's a movement and a spark.
- ★ Participate actively.
- ★ Think systemically.
- ★ Ask bold questions.
- ★ Learn from peers and mentors.
- ★ Ask how your skills can serve society.
- ★ Design as if the future depends on you — because it does.


Design with Purpose
Lead with Vision

Q & A

this is your 6-week project

My NewCo Idea

slide #1

what is the problem/need you are solving

slide #2

who might be interested in the problem

slide #3

how do you propose to solve the problem

slide #4

who else has a solution for the problem

slide #5

how good and competitive is your solution

slide #6

can you sustain your solution

slide #7

how are you going to make money; how much money is there to be made

slide #8

what do you need to make that money

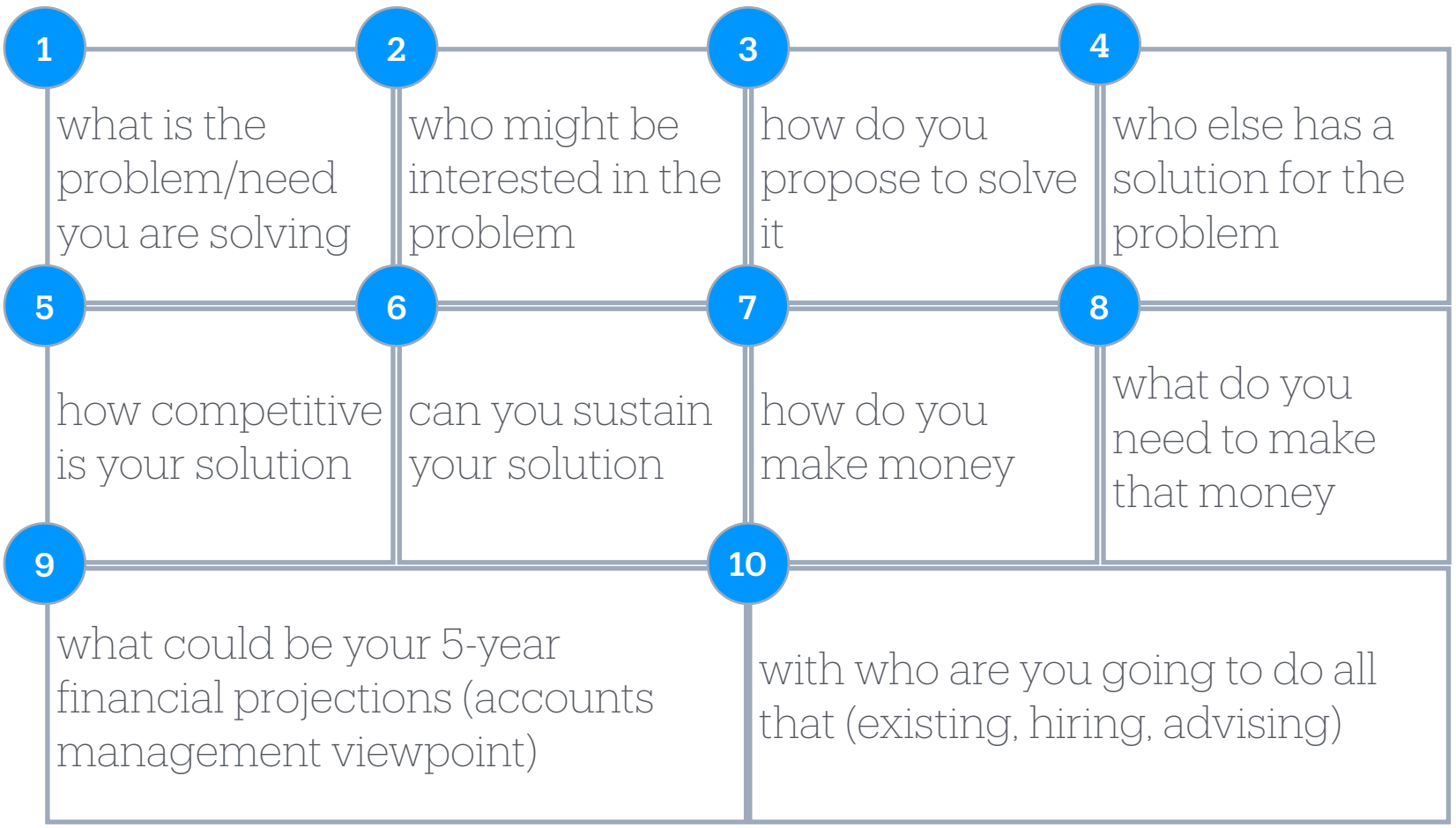
slide #9

what could be your 5-year financial projections (cash-only viewpoint)

slide #10

with who are you going to do all that (founders, key hires, advisors)

congratulations!



you are ready to pitch your business plan!