

Digital konstruktion och inbyggda system

Vad går det ut på egentligen?

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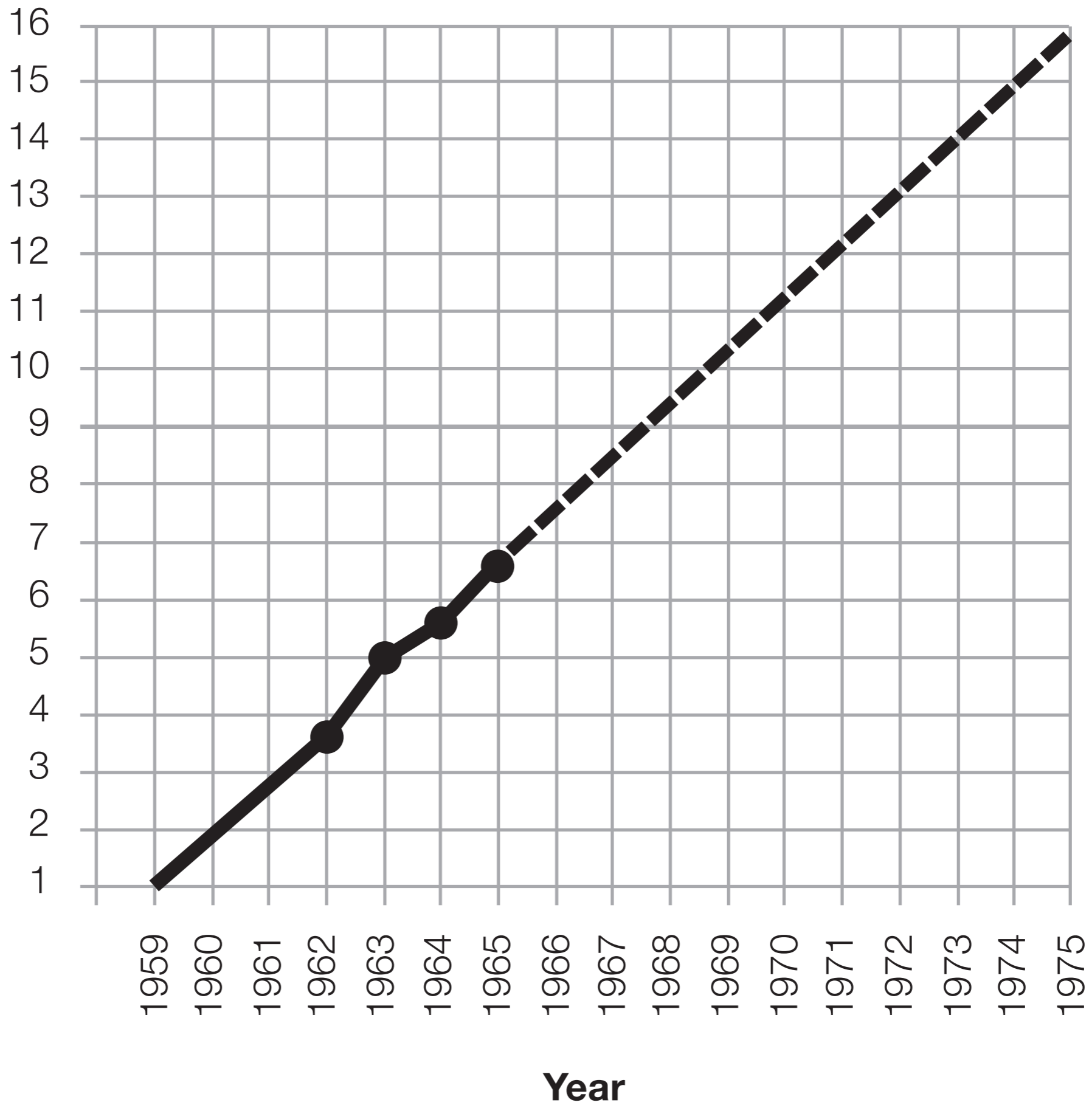
Cramming more components onto integrated circuits

With unit cost falling as the number of components per circuit rises, by 1975 economics may dictate squeezing as many as 65,000 components on a single silicon chip

By Gordon E. Moore

**Director, Research and Development Laboratories, Fairchild Semiconductor
division of Fairchild Camera and Instrument Corp.**

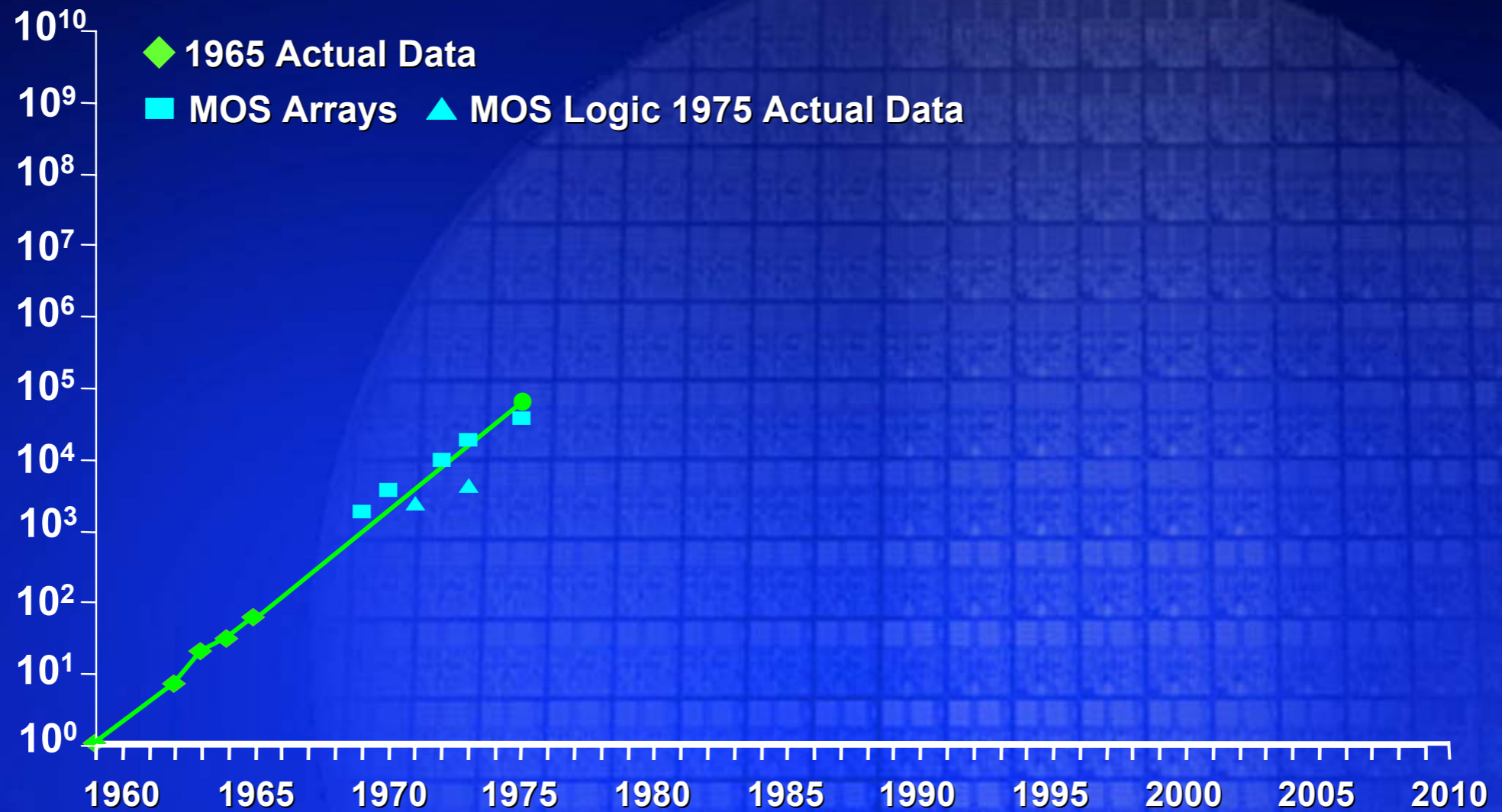
**Log₂ of the Number of Components
Per Integrated Function**



[Gordon Moore, 1965]

Integrated Circuit Complexity

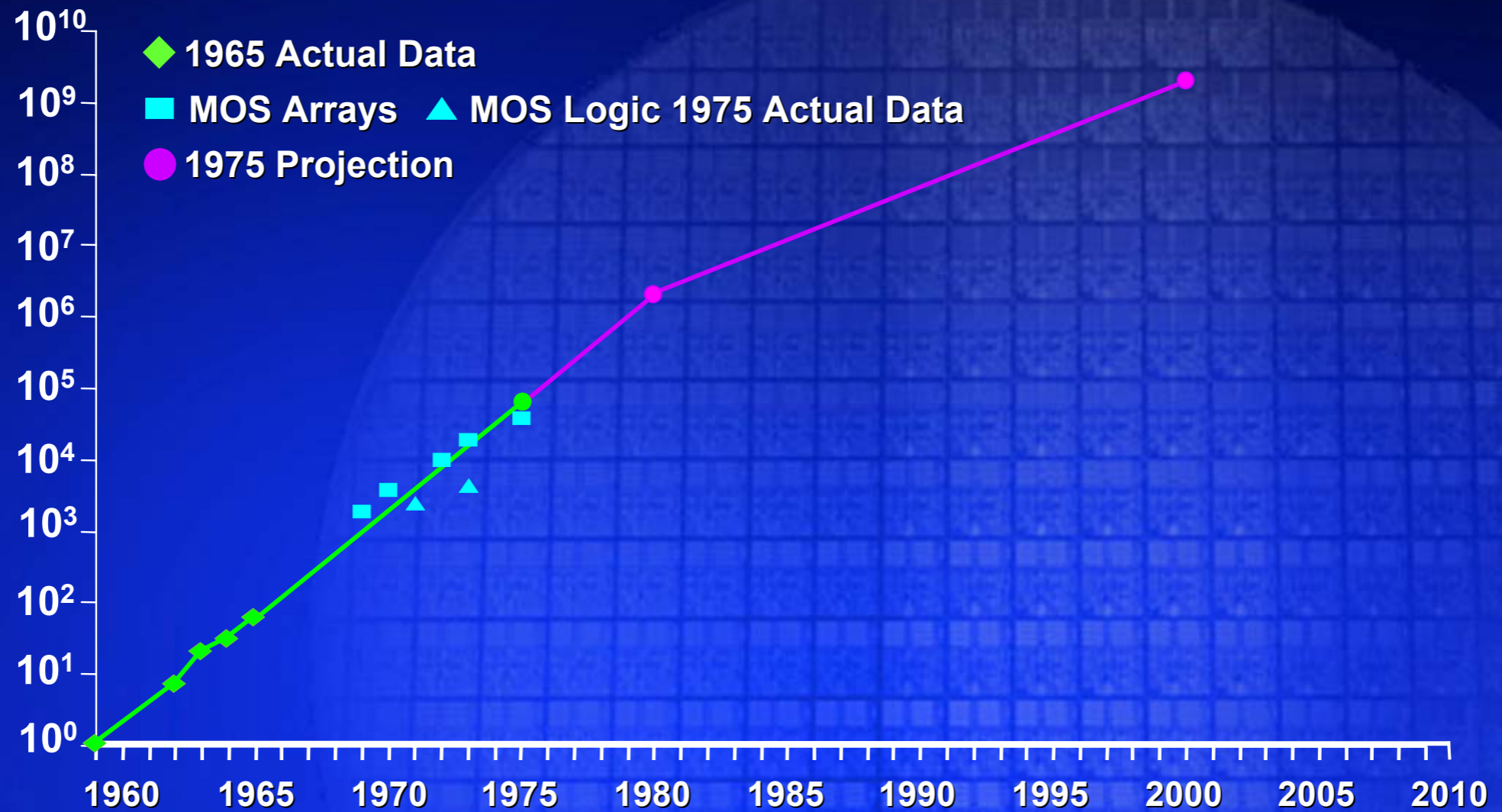
Transistors
Per Die



Source: Intel

Integrated Circuit Complexity

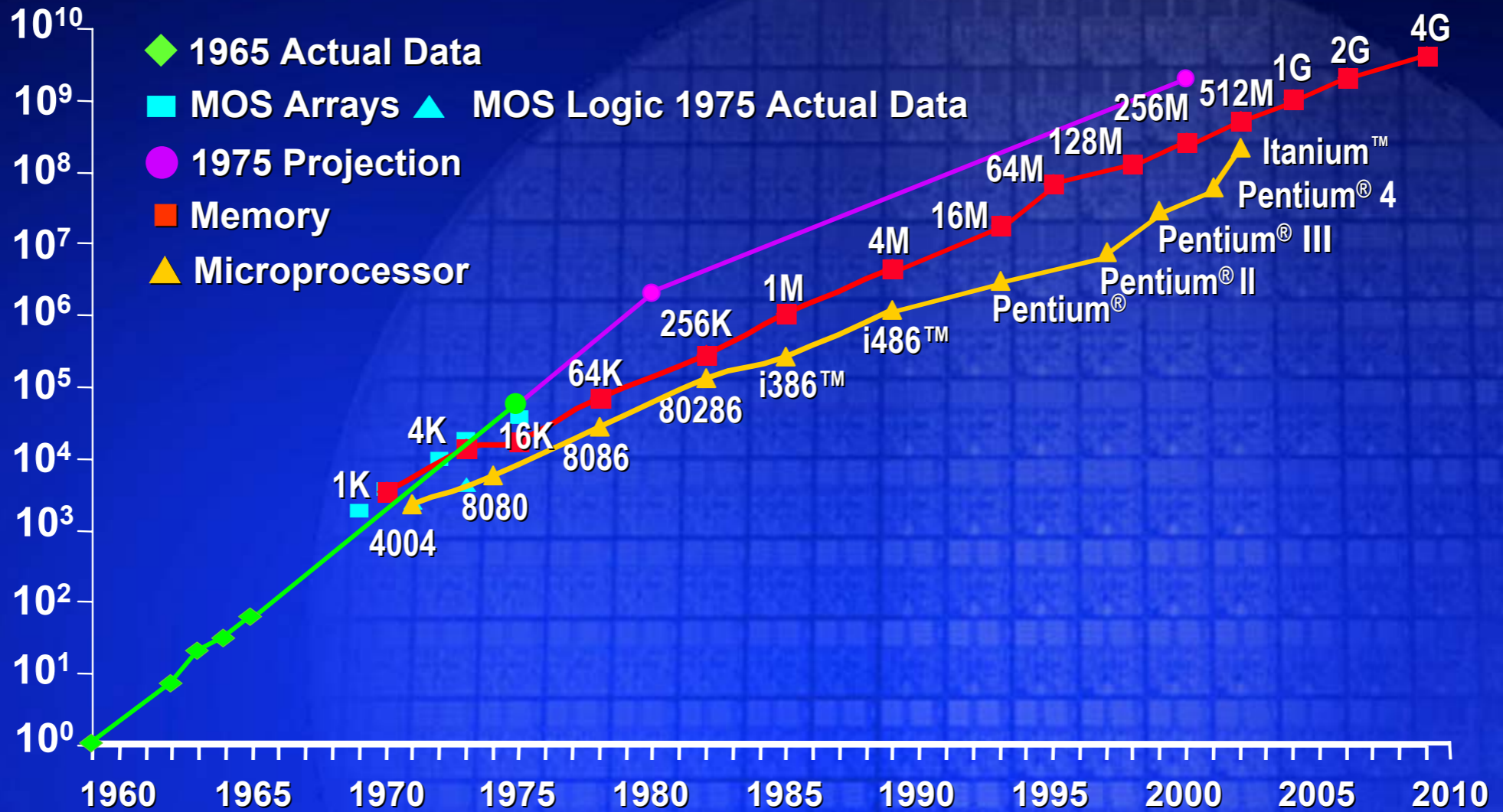
Transistors
Per Die



Source: Intel

Integrated Circuit Complexity

Transistors
Per Die



Source: Intel

- Mer för samma pris!
- Varje år!
- *1 femti år!*



...vilket får vissa
konsekvenser...

Komplexitet



- 1997
- SMS
- Väckning
- Flera ringsignaler

- 2013
- Web browser
- Bluetooth
- WiFi
- Video
- Kameror
- Kalender
- MP3-spelare
- Android / Linux
- Färgskärm
- Multitouch

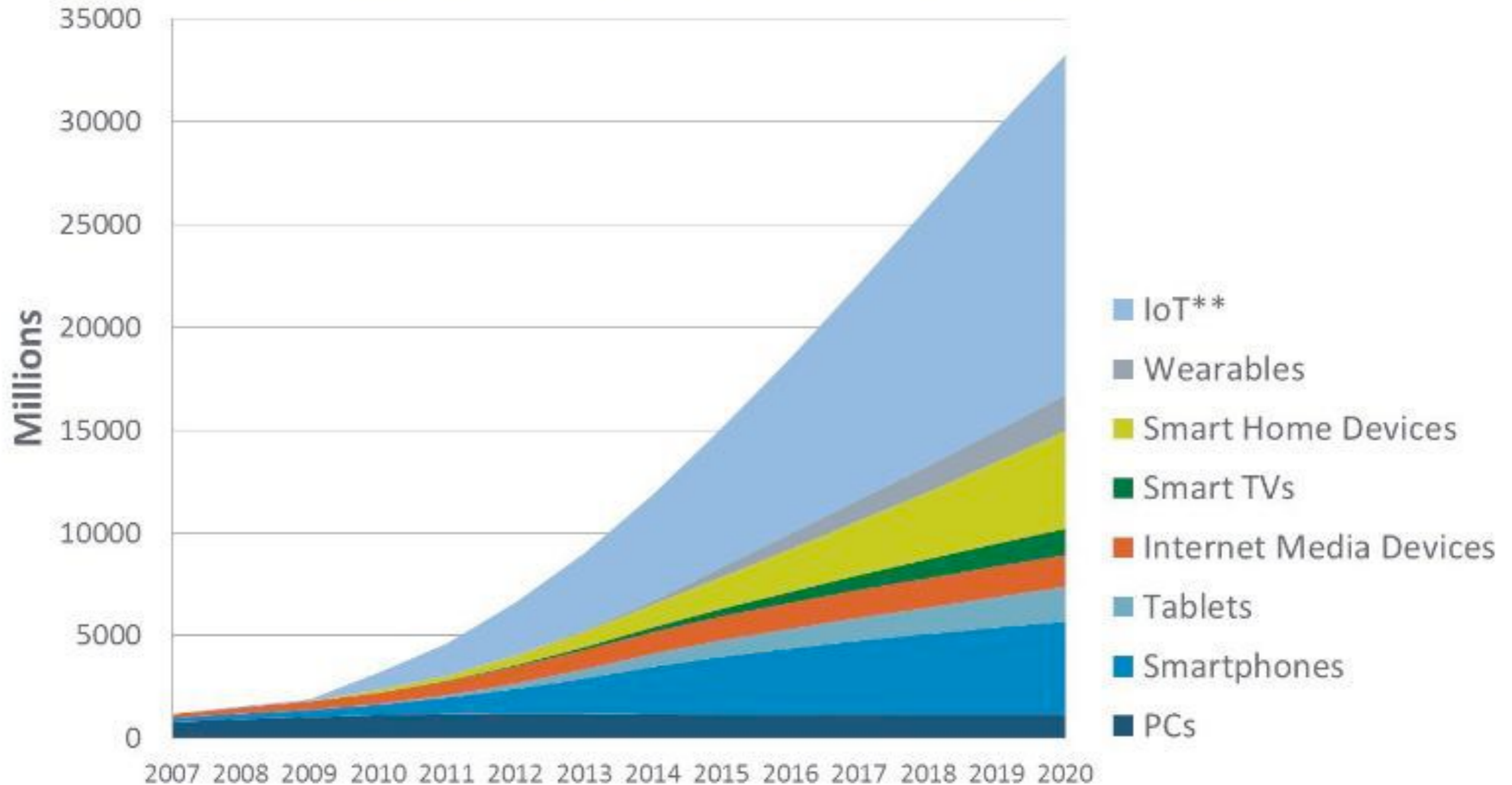


- Addressbok
- Kontinuerligt internet
- Sociala medier
- App store ...

Effektförbrukning

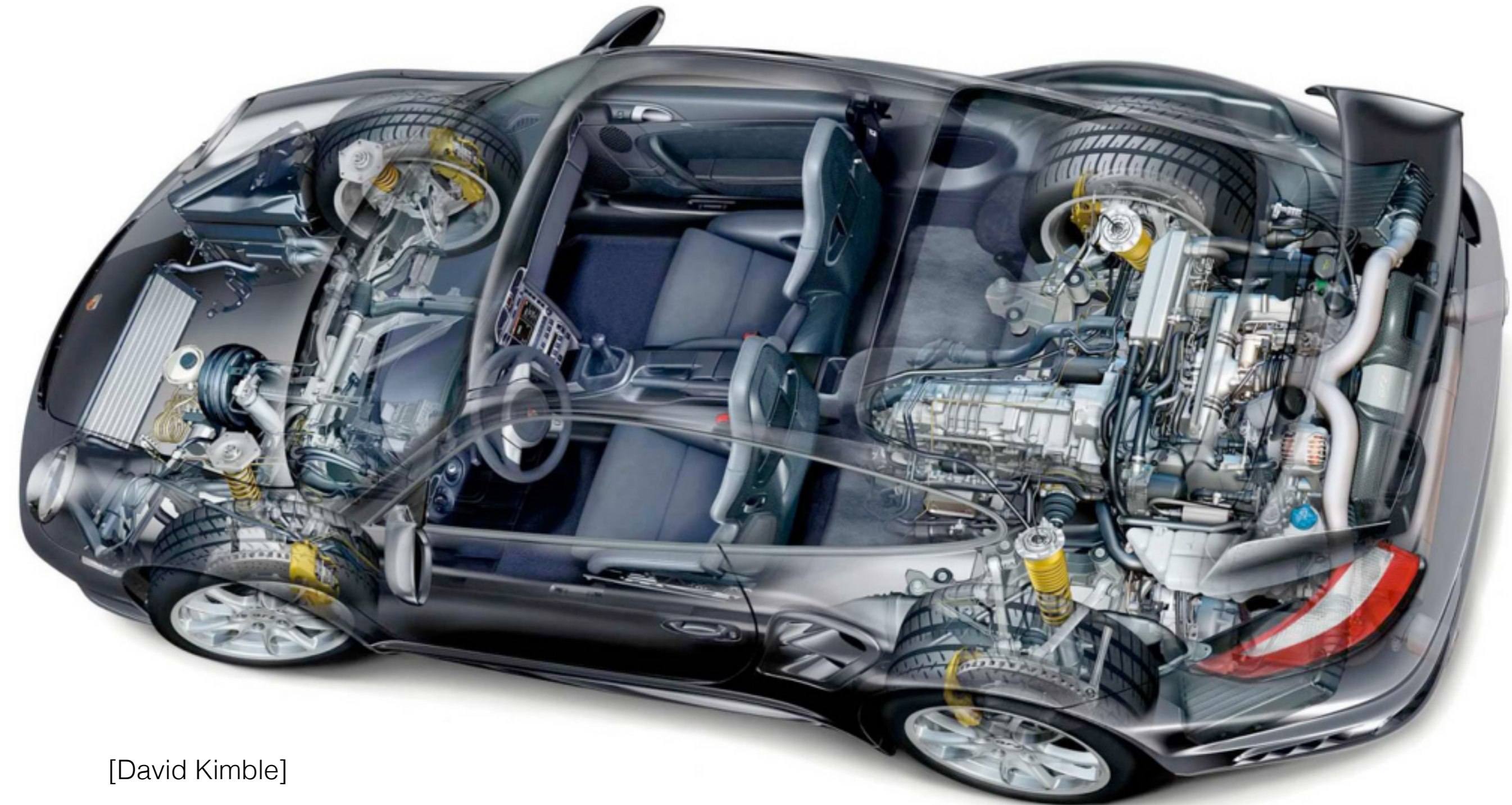
STRATEGYANALYTICS

Global Internet Device Installed Base Forecast



Source: Strategy Analytics October 2014

Pålitlighet



[David Kimble]

Pris? Andra krav?



Survival guide
för
konstruktörer!?!



Tjuvtricks:

- Ordning och reda.
- Datorstöd för ungefär allt.
- Återanvändning och massproduktion.
- Varianter via mjukvara.

Kurser

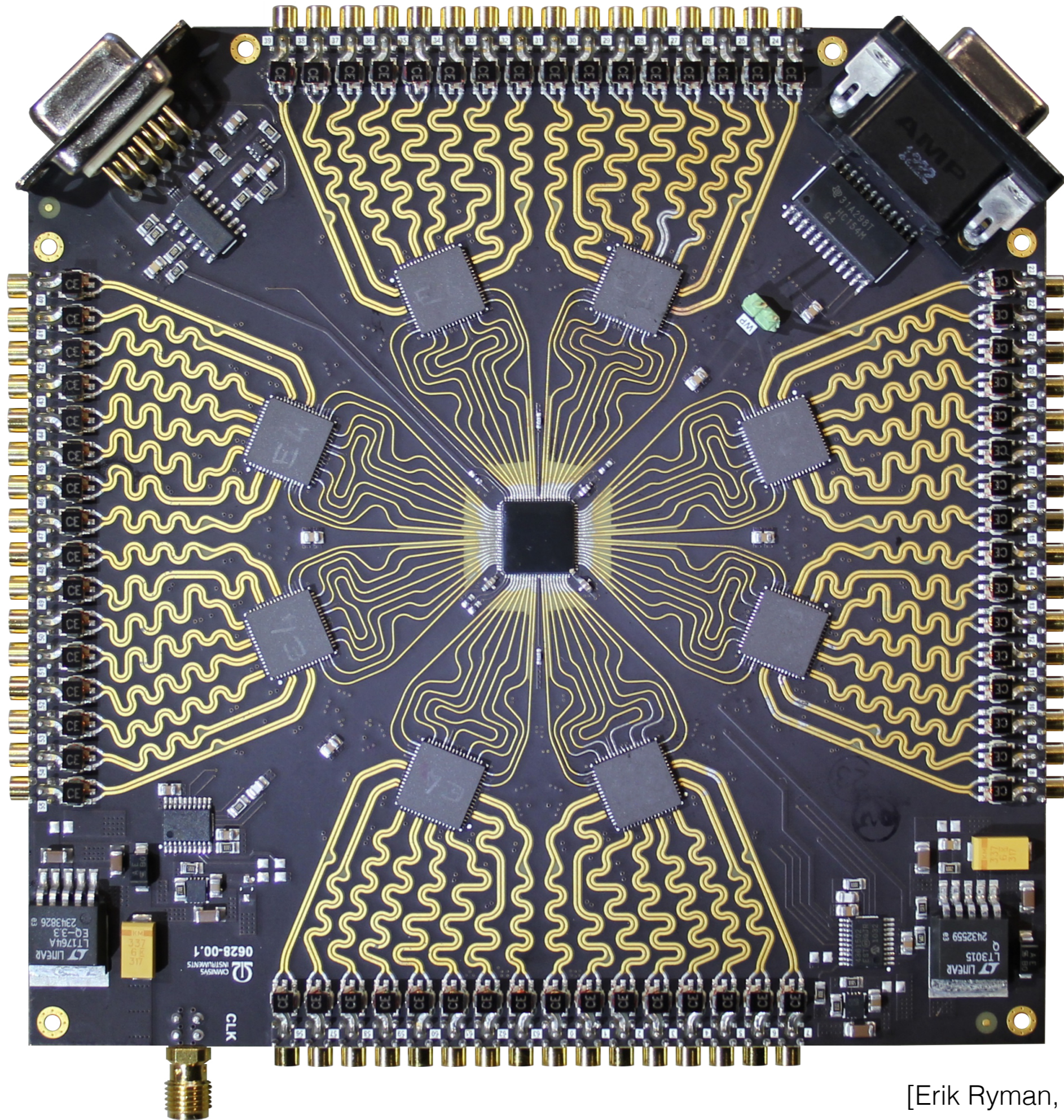
- Grundläggande dator teknik: EDA433 / EDA452 / DIT791
- Programmering av inbyggda system: DAT016 / EDA481 / DIT152
- Datatekniskt projekt: DAT290 / DIT214
- Datorsystemteknik: EDA331 / DIT122
- Digital konstruktion: EDA322 / DIT795
- Digital konstruktion, projektkurs: EDA234 / DIT796

Masterprogram

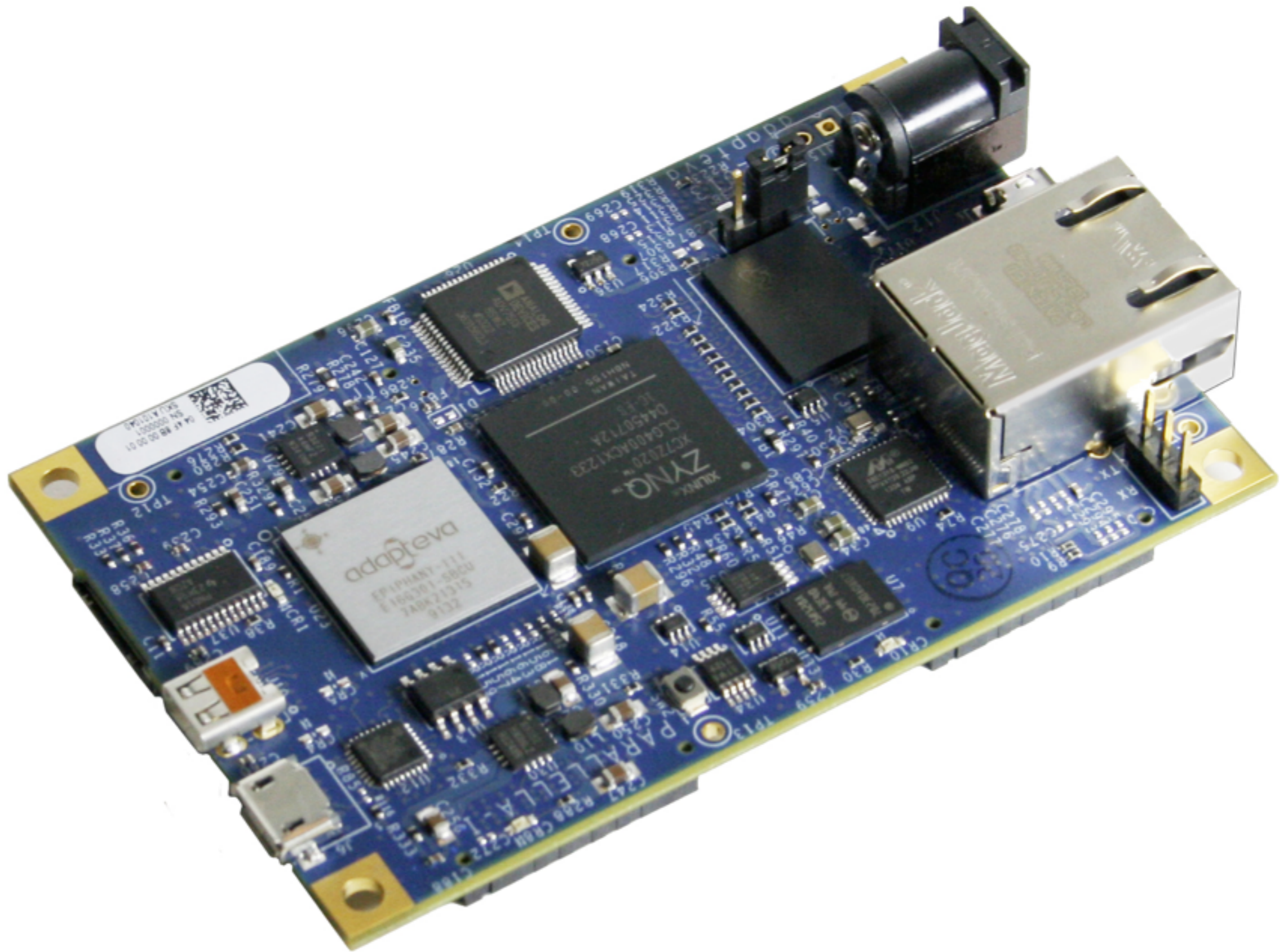
- Embedded Electronic System Design (“EESD”, “MPEES”)
- Fördjupning inom tekniska discipliner; men också...
- ...“systemiska aspekter”:
 - Hård / mjuk
 - Analog / digital
- Större konstruktionsprojekt

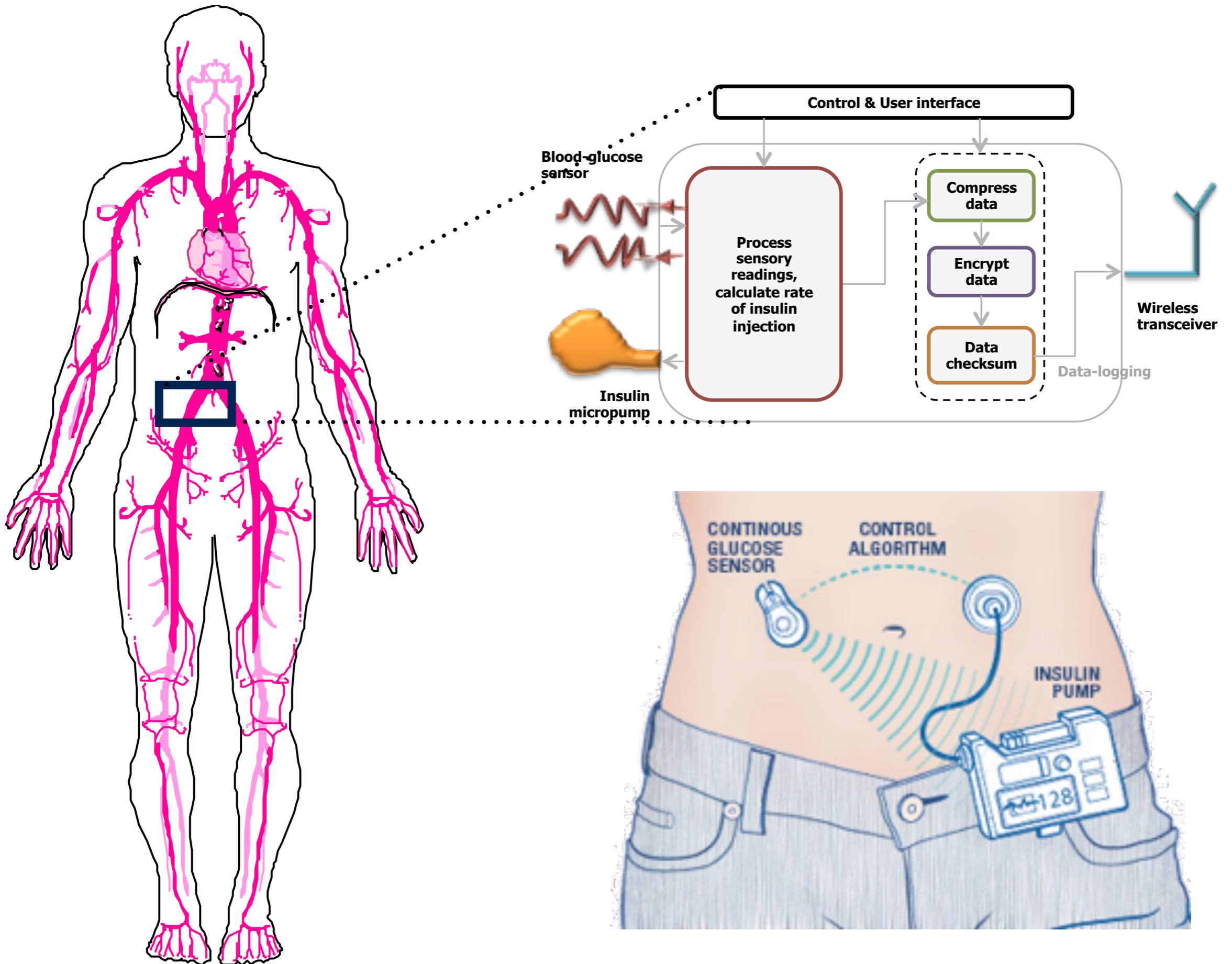
Forskning





[Erik Ryman, Omnisys + D&IT]

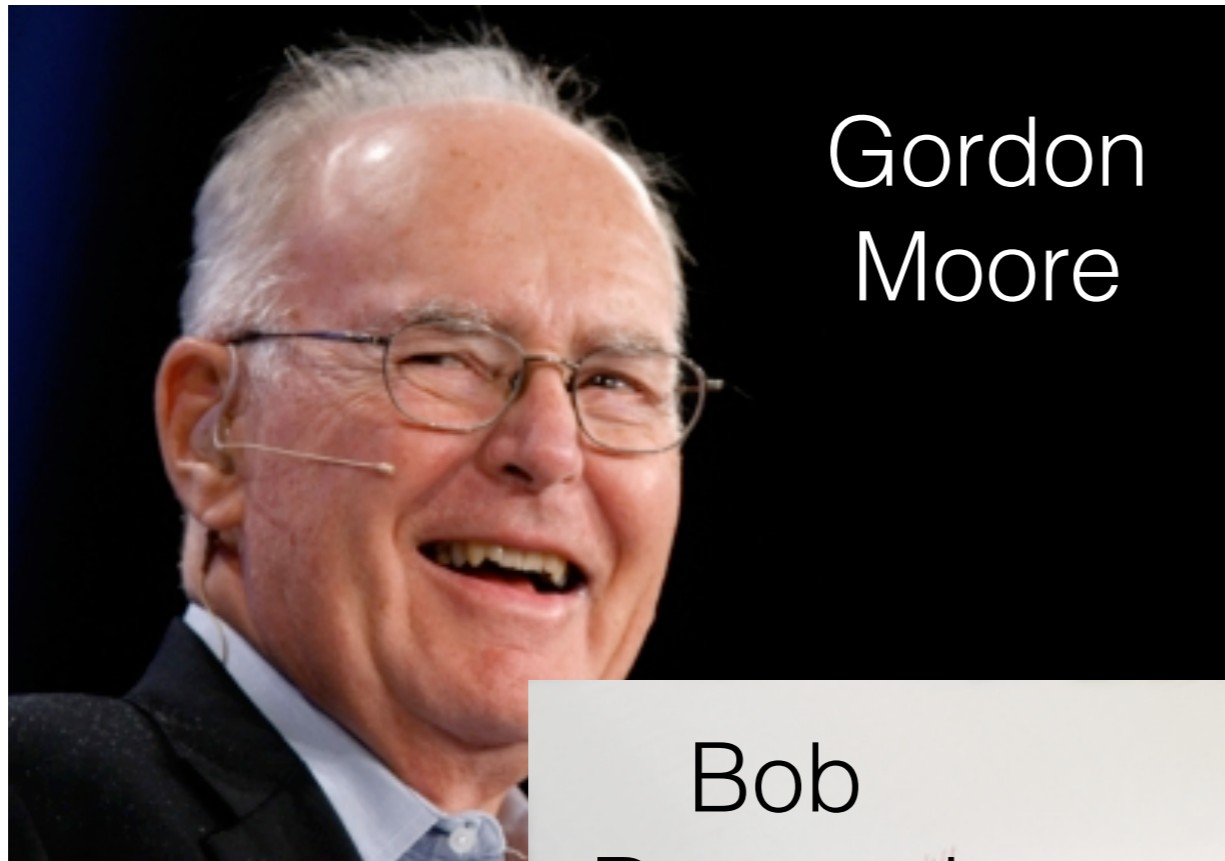




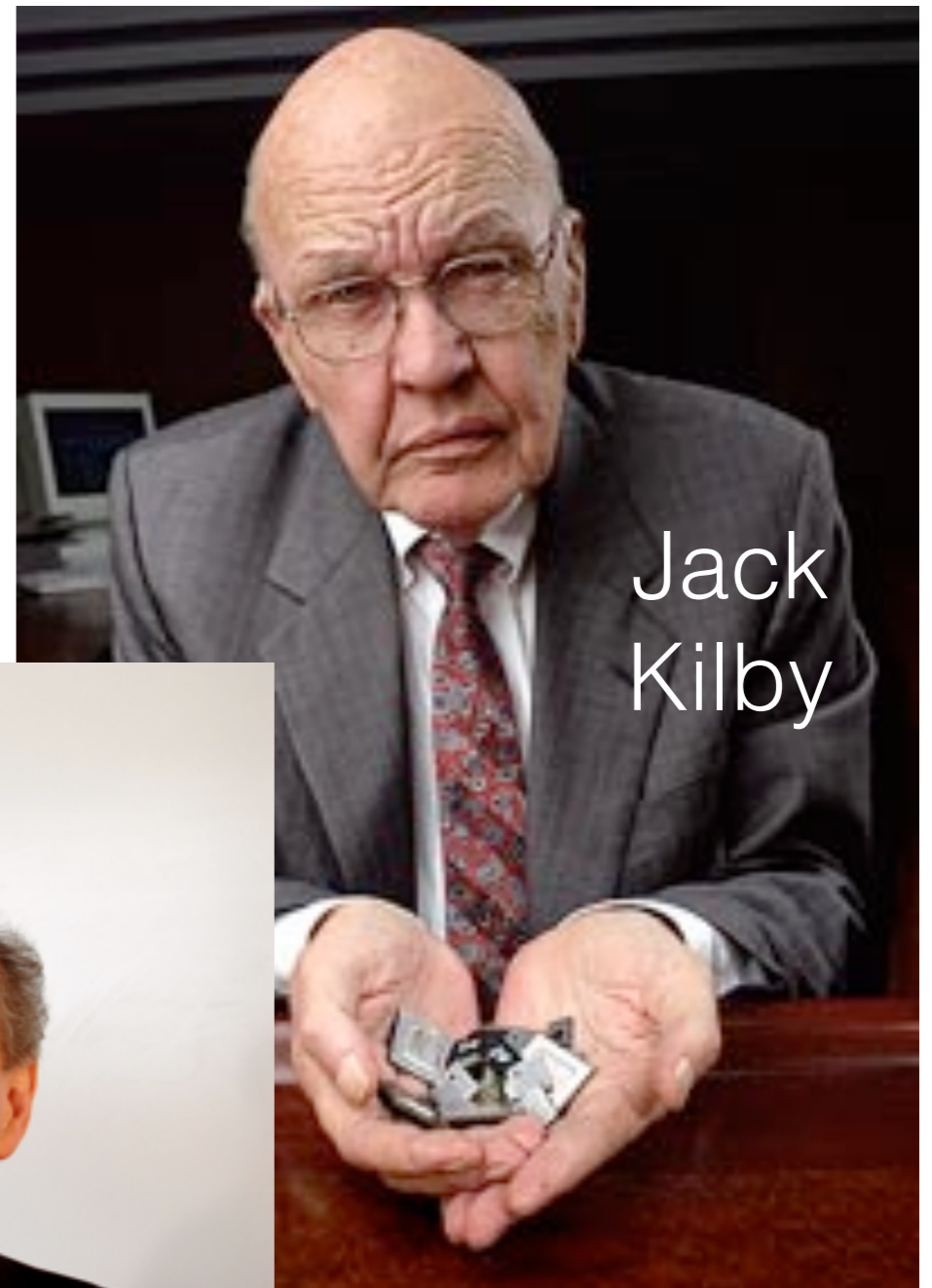
Jobb?

- Japp.

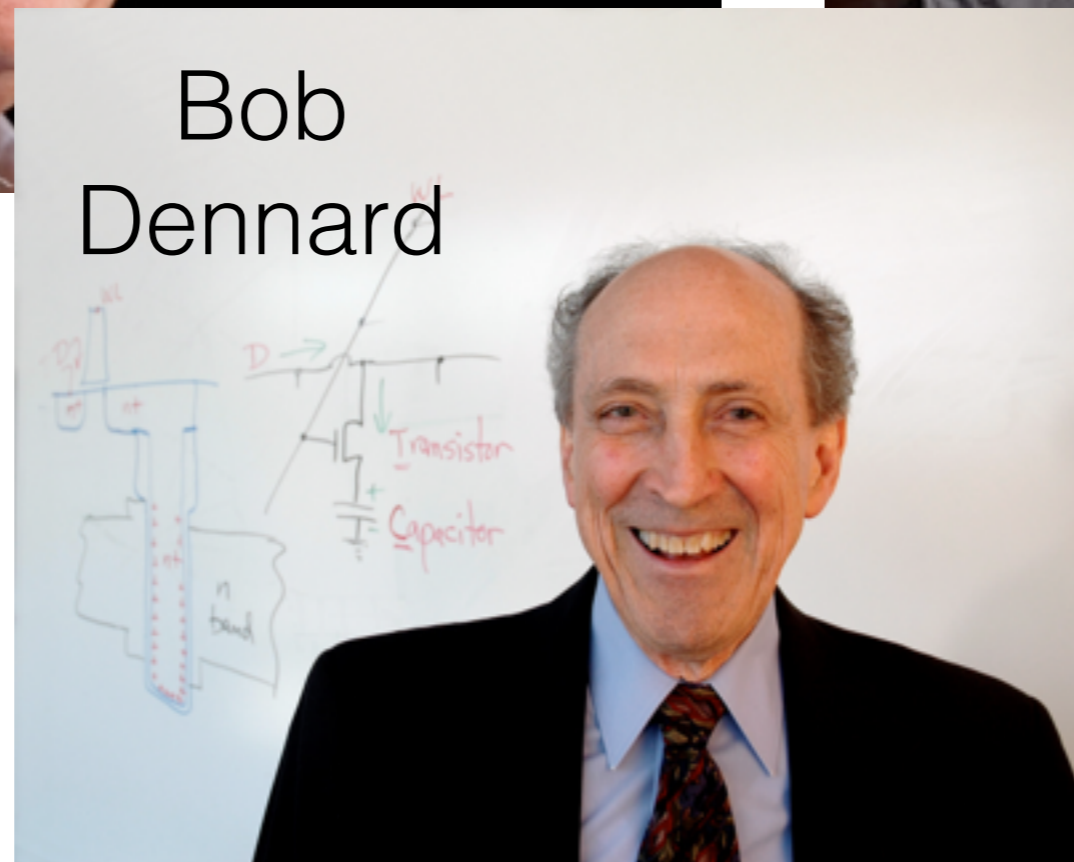
Gordon et al.



Gordon
Moore



Jack
Kilby



Bob
Dennard