
The Tall Thin Engineer

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History

- **This idea was promoted in the early 80's**
 - ✧ UC Berkeley
 - ✧ 3 Micron CMOS was just coming in
 - ✧ Design was done at the layout level in stick form
 - ✧ Wanted engineers to do chip design and layout
 - ✧ 1K gates to 100k gates
 - ✧ No layout tools to speak of
 - ✧ 1 MIP VAX was our computing engine
- **In some limited cases one engineer could do it all**
 - ✧ From layout to chip definition
- **Typically this was the domain of the circuit designer**
 - ✧ Spice and switch level simulators (Simon) were the tools
 - ✧ Layout was done by hand by the layout designer
- **In fact I don't remember any major chip produced by a single "Tall Thin Engineer"**

Motivation

- **Universities need this concept to be true**
- **Allows a very smart grad student to develop and prototype new ideas**
- **Most companies had a very expensive infrastructure to support the design community**
 - ✧ Process support engineers
 - ✧ EDA engineers
 - ✧ Packaging engineers
 - ✧ Marketing
 - ✧ Assembly & Test
 - ✧ Documentation
 - ✧ Layout designers
- **Universities could not afford this infrastructure or keep it alive**

What's Changed?

- The complexity has gone from 10k to 10M gates, an increase of at least 1000:1!
- We worry about more things than latchup and ESD
- We need to worry about codesign
- We need to worry about Submicron effects
- We need to worry about EDA tools working together
- We need to be an expert in system designs
- We need to be an expert in architectures
- We need to be an expert in logic design
- We need to be an expert in test
- We need to be an expert in software design and architecture
- We need to be an expert in circuit design

Conclusion

- The “Tall Thin Engineer” never really existed in any volume except at UCB in the early 80’s
- The design task today is many orders of magnitude harder than it was in 82
- That would require that engineers are significantly smarter and have the stamina to work 24X7
- This person would have to be very very tall and very very thin
 - ✧ Not sure many of these people exist, at least in volume?