Moore's law: the silent death.

In 1965, Gordon Moore, one of the founders of Intel, observed that the number of transistors was doubling every 24 months and would continue to do so. For 40 years the chip industry managed to live up to that prediction. The first integrated circuits in 1960 had ~10 transistors. Today the most complex silicon chips have 10 billion. Think about it. Silicon chips can now hold a *billion* times more transistors.

However, this law has passed away about a decade ago, but this death was rather silent and did not get enough publicity. The reasons this law is dead now are:

-1 Monetary constraint: Nowadays ships are actually "printed," not with a printing press but with lithography, using exotic chemicals and materials in a "fab" (a chip fabrication plant — the factory where chips are produced). Increasing the number of transistors in each generation of chips requires the fab to "shrink" the size of the transistors. The first transistors were printed with lines 80 microns wide. Today Samsung and TSMC are pushing to produce chips which features few dozen nanometers across. That's about a 2,000-to-1 reduction, which will cost millions of Dollars

-2 Physical constraint: a physical limitation called Dennard scaling– as transistors get smaller, their power density stays constant, so that the power use stays in proportion with area. This basic law of physics has created a "Power Wall" — a barrier to clock speed — that has limited microprocessor frequency to around 4 GHz since 2005. It's why clock speeds on the microprocessor stopped increasing with leaps and bounds 13 years ago. And why memory density is not going to increase at the rate we saw a decade ago.

While this seems alarming and could mean the end of the giant Intel and its rivals, the reality is we are going to have designers to think out of the box and move away from thinking that adding value to the computers end users can only be achieved through faster processors, they need to focus on adding value to the end user by providing innovative feature and more secured machines.