Moore’s law

Moore's law is the observation that the number of transistors in a dense integrated circuit (IC) doubles about every two years. Moore's law is an observation and projection of a historical trend. Rather than a law of physics, it is an empirical relationship linked to gains from experience in production.

The observation is named after Gordon Moore, the co-founder of Fairchild Semiconductor and CEO and co-founder of Intel, who in 1965 posited a doubling every year in the number of components per integrated circuit, and projected this rate of growth would continue for at least another decade. In 1975, looking forward to the next decade, he revised the forecast to doubling every two years. While Moore did not use empirical evidence in forecasting that the historical trend would continue, his prediction held since 1975 and has since become known as a “law."

Moore's law stopped being true for the reasons as follows:

1- As transistors increase, power demand increases, which increases heat.

2- Smaller transistors switch faster.

3- Exponential increase in density would lead to exponential increase in speed.

4- Transistor’s need a minimum voltage to switch (threshold voltage) and voltage reduction has lower limits due to noise.

5- Dynamic power consumption is reduced by voltage scaling.

6- Voltage scaling does not prevent power leakage.