Moore's Law

Moore's Law is an empirical observation that number of transistors in an integrated circuit doubles every two years, leading to an exponential increase in computing power. It was made by Gordon Moore in 1965.

While Moore's Law held true for some period of time, it is now obvious that number of transistors on microchip is limited due to physical limitations.

1) Energy Efficiency: More transistors consume more power and the voltage must stay above threshold voltage. Also as transistors become smaller and more densely packed, they can become less energy-efficient, leading to diminishing returns in terms of performance per watt.
2) Heat Dissipation: As transistor density increases, so does power consumption and heat generation. Cooling these densely packed chips becomes increasingly challenging.
3) Other physical limitations that can lead to manufacturing challenges, material limitations etc.