Moore's law is the observation that the number of transistors in an 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 doubling period is often misquoted as 18 months because of a separate prediction by Moore's colleague, Intel executive David House. In 1975, House noted that Moore's revised law of doubling transistor count every 2 years in turn implied that computer chip performance would roughly double every 18 months (with no increase in power consumption).

Mathematically, Moore's Law predicted that transistor count would double every 2 years due to shrinking transistor dimensions and other improvements. As a consequence of shrinking dimensions, Dennard scaling predicted that power consumption per unit area would remain constant.

There are some concerns that Moore's law may be coming to an end. The physical limits of semiconductor manufacturing are being reached, and it is becoming increasingly difficult to shrink transistor dimensions.

Here are some of the limitations of Moore's law:

- **Heat**: As transistors get smaller, they generate more heat. This is because the electrons have less space to move around, and they collide with each other more often. This heat can damage the transistor, and it can also make it difficult to cool the chip.
- **Voltage**: The voltage required to switch a transistor on and off also decreases as the transistor gets smaller. This is because the electric field required to move the electrons across the transistor's gate is smaller. However, the lower voltage also makes the transistor more susceptible to noise.
- **Noise**: Noise is any unwanted signal that can interfere with the operation of a transistor. As transistors get smaller, they become more susceptible to noise.

This is because the electrons have less space to move around, and they are more likely to be affected by random fluctuations in the electric field.

- **Scaling**: The scaling of transistors is the process of making transistors smaller and smaller. This is the key to Moore's law. However, as transistors get smaller, it becomes more difficult to control their operation. This is because the physical effects that govern the operation of transistors become more pronounced.