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 Intel (and former CEO of the latter), who in 1965 posited a doubling every year in the number of components per integrated circuit,[a] 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, a compound annual growth rate (CAGR) of 41%. 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 prediction has been used in the semiconductor industry to guide long-term planning and to set targets for research and development, thus functioning to some extent as a self-fulfilling prophecy. Advancements in digital electronics, such as the reduction in quality-adjusted microprocessor prices, the increase in memory capacity (RAM and flash), the improvement of sensors, and even the number and size of pixels in digital cameras, are strongly linked to Moore's law. These step changes in digital electronics have been a driving force of technological and social change, productivity, and economic growth.

Industry experts have not reached a consensus on exactly when Moore's law will cease to apply. Microprocessor architects report that semiconductor advancement has slowed industry-wide since around 2010, below the pace predicted by Moore's law. However, as of 2018, leading semiconductor manufacturers have developed IC fabrication processes in mass production which are claimed to keep pace with Moore's law.