

The story of the computer - Part C

ers began to double every two years. Minicomputers appeared on the market and with the creation of the first software packages, a new industry, the software industry, was born. These packages were 'canned programs', readily available on the market, which a corporation could buy and use, instead of having to write its own programs.

The **fourth generation** (roughly 1975-1985) is marked by significant advances in the electronics industry that allowed whole computer subsystems to fit on a single circuit board. This period saw the appearance of desktop computers, which was a major step toward popularizing computing.

The first desktop computer, the Altair 8800, became available in 1975, and is credited as the spark that ignited the microcomputer revolution. In 1981, IBM introduced its first desktop computer, called the *personal computer*, or PC, whose underlying software was developed by the then newly-formed Microsoft. This generation is also marked by the emergence of computer networks.

The **fifth generation**, which started in 1985, is mostly characterized by the miniaturization of computing machines. It has witnessed the appearance of laptop computers, numerous improvements in secondary storage media (CD-ROM, DVD, etc.), as well as the use of multimedia, the emergence of the Internet, and the phenomenon of virtual reality. Perhaps the most revolutionary application of electronic miniaturization is found in the *smartphone*, the pocket-sized computing device, which is a lot more powerful than the supercomputers of previous decades.

In order to get a more thorough picture of the specifics of each generation, take a look at the table on the next page.

"Computers have lots of memory but no imagination."

Bill Gates



C. (1950-present): From the 50's onwards, the history of computers is closely linked to advancing technologies. The most important technological achievements of the period include the invention of a small semiconductor device that would ultimately change the world, namely the transistor, and the development of integrated circuits. For these major breakthroughs physicists William Shockley, John Bardeen, and Walter Brattain, on one hand, and Jack Kilby, on the other, were awarded Nobel Prizes in physics.

The third period is conventionally subdivided into five computer generations, whose precise boundaries are not broadly agreed upon. Computers built in this period as a rule follow the von Neumann model. Instead of the room-sized machines of the 1940s, computers now are considerably smaller; they have also become a lot faster and cheaper.

The **first generation** (approximately 1950-1959) is characterized by the emergence of costly commercial computers which were affordable only by big organizations, and for this reason were used solely by professionals. They were bulky, used vacuum tubes as electronic switches, and were locked in rooms with limited access.

In **second-generation** computers (roughly 1959-1965), vacuum tubes were replaced by transistors. This reduced their size and cost, and made them affordable to smaller corporations. At the same time, high-level programming languages, such as FORTRAN and COBOL, were invented and made programming easier.

The **third generation**, lasting roughly from 1965 to 1975, is characterized by the invention of the integrated circuit and the chip, which reduced the cost and size of computers even further. At the same time, the processing power of comput-