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The Evolution of Computer Technology

Introduction

Fifty years ago, the U.S. Army unveiled the Electronic Numerical Integrator and Computer the world's first operational, general purpose, electronic digital computer developed at Moore School of Electrical Engineering, University of Pennsylvania. Of the many scientific developments spawned by World War II, the Electronic Numerical Integrator and Computer ranks one of the most influential and pervasive.

Hardware

Processors

In 1971, responding to a request for a chip for a new calculator, and incredible circuit, Intel built the world's first single chip general-purpose microprocessor. The 4004 had 2301 gates at a clock speed of 1MHz and contained 2300 transistors. It processed data in 4 bits, but its instructions were 8 bits long. The 4004 addressed up to 16K of program memory and up to 4K of data memory (in separate address). It had sixteen 4-bit (or eight 8 bit) general-purpose registers, and an instruction set containing 60 instructions.

The 386 processor

The 80386 heralded the beginning of a new age for the IBM PC. The 386 was the first 32 bit x86 processor. As such it was capable of executing the 80486 assembly language and using the software written for general user interfaces. The 386 introduced a 32-bit instruction set and a full 32-bit floating point unit. This was accomplished by using two operating modes: "real" mode, which mirrored the segmented memory of the older 80x86, and "protected" mode which took full advantage of the 309.32 bit enhancements. Unfortunately it was several years before PC operating systems could make use of its 32 bit capabilities.

The Intel Pentium processor

It began shipping in late 1995, and swept through the PC industry faster than any of

Intel's previous processors. Although Intel's 80486 (1989) included a built FPU and was much faster than the 386, it was the Pentium that introduced the most significant changes in the x86 micro-architecture: 32-bit register files, Superscalar hard-CISC architecture (up to 16), 64-bit floating point registers. The Pentium contained 3.1 million and initially ran at 60 MHz. It was called the Pentium rather than the 80586 to avoid confusion with the copyright names of x86 processors from AMD and NexGen (now AMD 586 and 585).

Hard drives

In 1973, IBM developed what is considered to be the first true sealed hard disk drive. The drive was called the "Winchester" after the site of the same name. It used tape 30 MB platters. Over the following decade, sealed hard disks (often called Winchester disks) took their place as the primary data storage medium, readily in mainframes, then in microcomputers, and finally in personal computers starting with the IBM PC/XT in the 1980s. By the late 1980's hard disk capacity had improved by almost a thousand fold, with single hard disk units able to store Gigabytes of data. Moving on into the 21st century, new hard drives of personal computers may reach up to 256 Gigabytes of data.

Software

C Programming language

In the 70's the talented programmers at AT&T Bell laboratories (Brian Kernighan

and Dennis Ritchie) invented the C programming language. C was far from being the

first high level language, but its pointer arithmetic and low-level approach made it the first language, which could completely replace assembly language programming, even for most of the elements of an operating system. C was the first systems programming language which no longer did an operating system need to be tied to a particular piece of hardware.

Word Perfect

In 1984, Software International introduced Word Perfect, a powerful new word processor for the IBM PC. Despite having a more bland and ordinary character set user interface, Word Perfect soon became the dominant word processor for the PC market, especially in the business and secretarial world. The ability to use Word Perfect became an essential skill for most secretaries.

Operating Systems

CP/M developed by Gary Kildall in 1974, CP/M stood for Control Program for Microcomputers. It was the first operating system to run on hardware from different vendors. It also became the preferred operating system for software development on small systems. In the mid 1970's, CP/M looked like it would rule forever, but unfortunately the early personal computers chose not to use CP/M, electing instead to provide BASIC interpreter as their primary "operating system".

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