Computers Part 1 - A Short History of the Computer

Every office runs on computers, yet few of us know where they came from. A computer is a machine that follows stored instructions to work on information. Its story runs from brass gears to the phone in a pocket. This first part tells that story in three steps: the early mechanical machines, the age of electronics, and the arrival of desktops, laptops and phones. Hind, an office manager at a small engineering consultancy, will connect each step to the machines her team uses every day. Part Two explains the main parts inside a computer and how to choose them.

1. From Gears to Programs

Early calculators were mechanical. In the seventeenth century, Blaise Pascal built a gear machine that added and subtracted, to help his father, a tax official. In eighteen twenty-two, Charles Babbage proposed the Difference Engine, a machine to produce mathematical tables without human error. Later he designed the Analytical Engine, with a store for numbers, a mill for calculation and punched cards for instructions. It was never completed in his lifetime. Yet the three ideas, memory, processor and program, are still the heart of every computer. In eighteen forty-three, Ada Lovelace published notes on how such a machine could be programmed.

Example: A family has one washing machine. On Monday it runs a gentle program for shirts, and on Tuesday a hot program for towels. The drum and the motor never change; only the chosen program does. Nobody buys a new machine for every kind of laundry. That is exactly what Babbage's idea of separating the machine from its instructions means: the same machine does different jobs when the instructions change.

At work: Hind's consultancy has one computer in the meeting room. In the morning, an engineer opens drawing software on it to review a plan with a client. In the afternoon, an accountant opens the payroll program on the same machine. Nothing inside it is replaced between the two jobs; only the instructions change. That is exactly what hardware and software mean: the machine stays the same, and the software decides the work.

2. From Vacuum Tubes to Chips

The first large general-purpose electronic computer, ENIAC, was built at the University of Pennsylvania to calculate artillery tables, and it was announced in nineteen forty-six. It used roughly eighteen thousand vacuum tubes and filled a room. Tubes burned out often, like light bulbs, so the machine was frequently out of action. In nineteen forty-seven, researchers at Bell Labs made the first working transistor, a smaller switch that used less power. In nineteen fifty-eight, Jack Kilby showed the first integrated circuit, which put several parts on one piece of material. In nineteen seventy-one, Intel released its first microprocessor, built for a calculator, which put a whole processor on one chip. In nineteen sixty-five, Gordon Moore, who later co-founded Intel, had noticed that the number of components on a chip kept doubling. That steady growth, later called Moore's law, is why each new generation of chips could do more in less space.

Example: An old family radio had glowing tubes inside. It needed time to warm up, and when one tube failed, the whole set needed a repair. A small modern speaker plays the moment it is switched on. That is exactly what the transistor and the chip mean: smaller switches that use less power and need no time to warm up.

At work: When Hind joined the consultancy, its accounts ran on a computer as big as a cupboard in the back room. Today the accountants do the same work on laptops that fit in a bag, and the cupboard holds stationery. That is exactly what integrated circuits and microprocessors mean at work: more switches in less space, so the same job needs a much smaller machine.

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3. From Desktops to Pockets

The IBM Personal Computer arrived in nineteen eighty-one and made desk computers normal in offices. In nineteen eighty-four, Apple's Macintosh made the mouse and on-screen icons familiar to many people, so using a computer no longer meant typing commands. Portable computers followed, and laptops became everyday office tools. In two thousand seven, the first iPhone put a full computer in a pocket. A phone still holds the same basic ideas: a processor to work, memory to hold the work in use, and storage to keep files. Only the size changed.

Example: Before smartphones, a family on holiday carried a camera, a paper map, a pocket calculator, a music player and a notebook. Today one phone in a pocket does all five jobs. The idea did not change, since each job still needs a processor, memory and storage. What changed is size, because smaller switches were packed onto chips. That is exactly what the story from room-sized machines to pockets means: the computer shrank while its basic parts stayed.

At work: An engineer from Hind's office visits a building site. She opens the latest drawing on her phone, checks a measurement and sends a note to the accountant before leaving. Back at the office, the old desktop under the reception desk opens the same drawing too, only more slowly and on a bigger screen. Hind realises both machines have a processor, memory and storage. That is exactly what the history from desktops to phones means: the same basic parts, in different sizes.

Conclusion

In summary, computers grew from mechanical calculators and Babbage's designs, through vacuum tubes, transistors, integrated circuits and microprocessors, to desktops, laptops and phones. Through all these changes the machine became smaller while its basic ideas stayed: memory, a processor and a program. Knowing this story makes the parts of a modern computer easier to understand. Part Two opens one up, looks at each main part, and ends with how Hind chooses computers for her team.

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