

Topic 3: Computer revolution and trends forecast to 2050

1. Definition of the Computer Revolution

Computer revolution (also known as a digital revolution) is a point in time at which computers make a significant change to human civilization (Computer Hope, 2021). It refers to a profound and rapid transformation in the field of computing and information technology; encompasses significant advancements, innovations, and paradigm shifts that reshape the way computers are used, accessed, and integrated into various aspects of human life. Each computer revolution can be defined by the specific technology it introduced.

2. Importance of understanding technological evolution

Revolution is a bigger force shaping our world now than it ever has been. Each era of the computing revolution has been defined by boundaries and constraints. We overcome the constraints and push past the boundaries and we then forget the boundaries existed as we accelerate breakthroughs on the path to ubiquity. The great author and futurist Arthur C. Clarke's Profiles of the Future contains a quote that we think embodies the spirit of exploration and discovery perfectly: "The only way of finding the limits of the possible is by going beyond them into the impossible". There are a number of big-picture developments that are going to change how we all approach technology in the future. The end of Moore's law, the explosion of data, the evolution of the edge among them. We've been able to take for granted that there's a PC on every desk and in every home for so long that we forget how impossible of a goal that must have seemed in the late 70s and early 80s. Bill Gates wrote his first commercial program on an Intel 8008 microprocessor. The most powerful GPU used for training AI models right now is billions of times more powerful than this device. If you combined every 8008 ever made, that would still be several orders of magnitude less computing power than you carry around in your pocket in 2020. And that wasn't all.

The scarcity of compute at the beginning of the PC era was just one of many obstacles that had to be overcome before we could have personal computing so ubiquitous that we all have the luxury of taking it for granted. And here's the interesting thing: these impossible sounding constraints that Bill Gates and a bunch of other personal computing pioneers confronted in the early days of that era seemed more like challenges and opportunities to them than obstacles that should deter them. None of those pioneers could have accurately predicted what personal computing would become, but they had a pretty good idea of the trends that would enable what they were attempting, as well as the technical challenges that they had to overcome. They invested into those trends and focused their ingenuity and creativity on overcoming those challenges. So we want to focus specifically on the trends and constraints that are influencing one of the most significant developments in the history of computing: the explosion of large-scale machine learning models and rapid advancements in AI. Microsoft has been able to do some amazing things to drive this trend forward, but none of the major shifts in our computing revolution have happened just because of the efforts of one company. PCs became a phenomenon not because of the PC itself but because of the breadth of things people did with them. PCs are a platform for others to build on top of. The internet changed the world not because of TCP/IP and HTTP but because it was a platform for individuals and entrepreneurs and big businesses to create and innovate. Even what you do every day on your mobile device isn't about the technology in the device but more about the breadth of applications on those devices and the people, content, and services those applications connect you to. At every one of these inflection points, the leaps forward we made were because of the contributions of developers. Any platform is only as good as the developers who use it, so for AI to achieve its full potential it must be a platform, and this platform will need to be powered and delivered at truly unprecedented scale and democratized so everyone can innovate and build on top of it.

3. Current Technological Trends

Augmented Reality

AR overlays digital elements on the real world using sensors like GPS to track location and direction. Popularized by games like Pokemon Go, AR has a variety of applications. From virtually trying furniture before you buy to assisting brain surgery and analyzing football plays, AR is transforming many aspects of our lives.

Virtual Reality

Unlike AR, virtual reality is an immersive experience that isolates users from the real world, usually with the help of a headset and headphones to help. All five senses are also able to be incorporated. Instead of incorporating things into the real world, it replaces the real world and places users in completely new worlds. The technology allows users to use computer automation for a three-dimensional experience. VR combines hardware, like headsets, controllers and treadmills and software, like game engines, content management and training simulators to create the full experience. The two main features of VR are immersion, which works by canceling out the physical world and fully placing users in the virtual world, and interaction which elevates the immersion experience by allowing users to control elements. VR in this industry is expected to grow by around \$18 billion by 2028. The automotive industry also uses VR, with companies like Mercedes-Benz, Audi and Tesla using the technology to build virtual showrooms.

Internet of Things (IoT) advancements

The Internet of Things (IoT) refers to a network of interconnected physical devices or "things" that communicate and exchange data with each other through the internet. These devices can include everyday objects embedded with sensors, software, and other technologies to collect, transmit, and receive data.

The primary goal of IoT is to enable these devices to gather and share information in real-time, creating a more connected and intelligent environment. The data collected by IoT devices can be analyzed to provide insights, monitor and control various processes, and facilitate automation.

IoT is gradually playing important roles in our lives. Therefore, studying the trends and future of IoT will be very useful for the development process. The future of IoT is promising, with many exciting developments for businesses on the horizon. Paragraphs below are some of the trends and predictions for the future of IoT.

Blockchain technology and its role in the revolution

Blockchain acts as a secure and shared record-keeping system for transactions and assets. It can track anything valuable, tangible or intangible. This technology offers faster, more accurate information sharing for businesses by creating a transparent and immutable ledger. By allowing all authorized members to see the entire transaction history, blockchain builds trust, improves efficiency, and opens up new opportunities.