The Apple Effect

5 Apple Revolutions:

Personal Computing

Publishing

Imaging

Video

Audio

iMug

Once upon a time, computers were complex, rare and expensive machines that companies – even countries – struggled to afford to build, buy or use.

Two guys in a garage precipitated a shift in our universe to one where computers are simple to use, yet more powerful than many dreamed possible.

The company they started, Apple Computer Inc, has consistently led the way in personal computing innovations and in developing many of the tools and technologies we take for granted.

The Apple Effect is a story of five revolutions in computing history. It is the story of how Apple Computer over the past thirty years has changed the way we work, learn and play.

Personal computing

Before the personal computer revolution began, computers occupied a large cabinet or even room, accepted input from punch cards, recorded data on magnetic tape, and required serious looking technicians in white coats to operate. Museum Victoria even has one such beast called CSIRAC.

Progress in miniaturisation of electronic components in the early 1970s resulted in computers getting smaller, accepting input from a keyboard and having a screen display, but they were still expensive and technically difficult to operate.

The world changed when it became possible for electronics enthusiasts to assemble components to make their own personal computer. Altair was the first to market components together in kit form, but two guys named Steve Jobs and Steve Wozniak, operating from a garage in California, were not far behind with a kit that is now known as the Apple I.

About 200 were produced, but that convinced the two Steves to found Apple Computer Inc and work on a computer that did not require electronics knowledge to assemble and use. It was the release of this model in 1977, the Apple][, which heralded the widespread leap of electronics from the mainframe to personal computing. Suddenly business, home and schools had access to computing power previously available only with mainframes.

The evolution of software

Early mainframe computers had to be programmed by methods which amounted to rewiring the circuits. Personal computers made the jump to programming languages—even the Apple I included Apple Basic—which evolved into 'software' when lines of code were compiled into machine readable form.

The invention of the floppy disk enabled pre-compiled software to be readily distributed instead of typed each time from a hard copy. Soon the software industry sprang up to develop programs with an easy to use interface to perform specific tasks, compiled onto floppy disk and distributed in shrink wrapped boxes.

The Apple][had three useful software tools which we now take for granted—the word processor, the spreadsheet and the database. These were the tools that made personal computers popular.

The internet

Perhaps the most profound change has evolved from an obscure piece of hardware called the 'modem' which enabled communication between computers over telephone lines. Academics in the USA (not Apple) devised protocols to facilitate communication, regardless of operating system, marking the birth of the internet.

Publishing

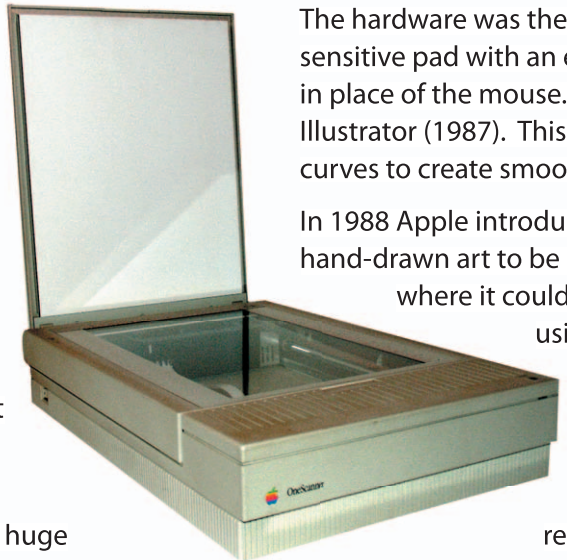
The Macintosh (with its brief forerunner the Lisa) in 1984 and the LaserWriter in 1985 took publishing from the printing press to the desktop.

The Macintosh was revolutionary in that a paper-like white display showed on screen exactly what would be printed (WYSIWYG or What You See is What You Get). Other computers showed green print on a black screen in a monospaced typeface with complex codes indicating formatting.

The Macintosh also made a huge leap forward with the introduction of the graphical user interface we now take for granted. Instead of a 'command line', the graphical interface used Window, Icon, Menu and Pointing device (WIMP). The mouse made it possible to easily access the screen, just as a pencil draws on paper, leading to graphics and the imaging revolution.

Reports, essays, brochures, newsletters and all manner of other printed works, with combined text and graphics, could now be produced on the desktop. But dot matrix printers lacked the sharpness of the printing press.

The Apple LaserWriter (1985) completed the leap forward by providing a means of printing text and graphics at a quality comparable with that of the professional printing press. In technical terms, this was accomplished by use of a page description language called Adobe PostScript, which supported printing of scalable text and graphics at high resolution.



Initially PostScript laser printing was expensive because it required huge processing power. Over 8 million dots had to be mapped and fed in an uninterrupted stream to the laser. This data processing could not be done on a host computer because, at the time, there was no way to move that amount of data fast enough through the printer port. The solution was to build another computer inside inside the laser printer, with enough RAM to cope with all the dots in one stream.

The expense of laser printing was more acceptable on the Mac because networking was built in from the start, enabling one printer to be shared easily between Macs, using simple-to-implement AppleTalk networking.

Specialist desktop publishing software such as Aldus PageMaker (1985) made it easy to combine text and graphics for printing.

This software was made possible because the Macintosh had the hardware to support it. With the Macintosh, Apple made a bold move from 5.25 inch floppy disks to 3.5 inch floppies. A second or external floppy drive was a lower cost storage option offered by Apple until hard drives became affordable. It enabled printing businesses to access material supplied by clients on floppy disk.

Imaging

The mouse made it possible to access any point on the screen, opening up exciting possibilities of scalable image manipulation. But trying to draw with a mouse was like trying to draw with a brick shaped pencil. This problem was solved by developments in both hardware and software. The hardware was the graphics tablet, a pressure sensitive pad with an electronic touch pencil in place of the mouse. The software was Adobe Illustrator (1987). This drawing program used bézier curves to create smooth lines, circles and arcs.

In 1988 Apple introduced a scanner, which enabled hand-drawn art to be quickly input onto the screen, where it could be digitally manipulated using graphics software.

Adobe, realising the need to manipulate scanned images, introduced Adobe Photoshop in 1990. This revolutionised photo retouching and processing by allowing changes to be made in digital form instead of manually. Digital manipulation was faster, non-destructive of the original and therefore, easily reversible.

Desktop colour printing made the imaging revolution affordable for amateurs. The colour inkjet printer made colour almost as cheap as black and white, whilst the Apple Color LaserWriter and other colour printing technologies satisfied the need for professional high quality colour output.

At a time when green-on-black display was considered normal, Apple led the industry with the technology needed to support colour monitors, printers and scanners. Meanwhile Adobe again led the software industry in 1993 with the portable document format (PDF) enabling documents, including images, to be sent to a printery for reproduction without plate manufacture.

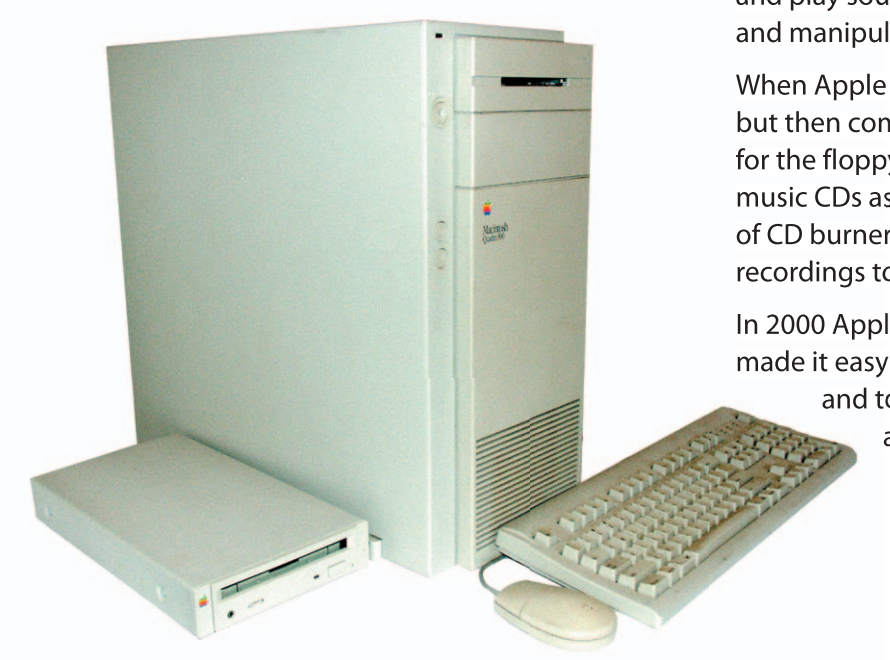
In January 1994 Apple again led the industry with the introduction of the QuickTake 100 digital camera and software that made it easy to capture and transfer digital images directly from camera to the computer for manipulation and printing. This is a revolution still evolving today with digital cameras now displacing film.

Video

The invention of video tape recording and lightweight video cameras soon resulted in the displacement of 8mm film as the primary means for amateurs to capture video. But editing video tape recordings was difficult.

In 1989 Avid introduced plug-in cards for the Macintosh which could convert video tape to digital format for editing and playback, but cost confined this technology to production studios.

In 1991 Apple introduced QuickTime software that allowed the Macintosh Quadra 900 to create, edit and display real time video if an analog to digital converter card was installed to facilitate video input. By 1993 the Macintosh AV series was supplied with the necessary cards to capture analog video recordings in digital format. The video revolution had arrived for amateurs, albeit well-heeled amateurs. Over the next few years this hardware became more reasonably priced and movie editing for all was within reach.



Today every Macintosh includes iMovie software, which supports video acquisition, editing and output, usually by burning straight to DVD. For professionals, Apple's Final Cut Studio supports high-end video editing in High Definition along with companion applications that support sound editing and animation.

Audio

In 1983 a group of musicians and music merchants agreed to standardise an interface by which new instruments could communicate control instructions with other instruments and microcomputers. This standard was dubbed MIDI (Musical Instrument Digital Interface) and Apple narrowly beat Atari to become the first manufacturer to adopt it with the Apple][. The electronic composer could now use a relatively inexpensive instrument, such as an electronic keyboard, controlled by a personal computer.

Software enabled note sequences played on a keyboard or other MIDI-capable instrument to be digitally recorded and played back by the Apple][or Macintosh. The logical progression was that a single keystroke could activate every device in the studio remotely and in synchrony.

This led to compositional software. Musicians with no programming experience could create an infinite variety of output routines using simple on-screen graphic displays. The composer could now invent a studio full of phantom instruments at will, limited only by the imagination.

The final result of the computer compositional revolution is that the computer can be used in live performances.

The Macintosh has always had the ability to record and play sound. Software quickly emerged to edit and manipulate these recordings.

When Apple introduced CD drives—at first external but then controversially as a complete replacement for the floppy disk—Macs were able to play music CDs as well as read CD ROMs. The advent of CD burners allowed users to transfer rare vinyl recordings to digital format.

In 2000 Apple introduced iTunes software that made it easy to manage these digital music files and to convert recorded sound files into the appropriate format for burning to a CD.

The following year Apple released the iPod, a small external hard drive to which digital music files could be downloaded. What was revolutionary was that the iPod also contained the necessary controls and software to enable it to function as a music playback device in its own right. With the addition of a colour screen and more storage capacity, the iPod morphed into a means of storing and playing video.

In 2003 Apple started its own digital music shop, the iTunes Store, selling online music downloads, creating the first legal music download service to catch on with consumers. The iTunes Store fully integrates with iTunes software and the iPod to create an easily managed music and video collection. Over one billion songs have now been sold and the iTunes Store leads a dramatic shift in sales of music and movies from bricks and mortar record and video stores to the internet.

Podcasting has taken the audio revolution to a new level, allowing the creation and publication of radio-style shows to a global audience. In mid 2005, Apple joined the podcasting revolution by integrating support for retrieval and publishing of podcasts into iTunes. Today, there are over two million podcast subscribers and tens of thousands of publishers.

Video casting was born by combining the video capability of the iPod with the publishing tools for podcasting. Coupled with the YouTube boom, budding video producers and movie stars can now show off their talents to millions of people at almost no cost.

The next revolution

It is said that the best way to predict the future is to look at the past.

One company stands out for thinking differently, for building seamlessly integrated hardware and software with the philosophy that technology should be easy to use, even fun.

Whatever the next revolution, if past history is any guide, it's a good bet there are people working on it right now at Apple Computer Inc.

iMug

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