

Recent Informatics History

Group Project 2

Bonus Question Latex

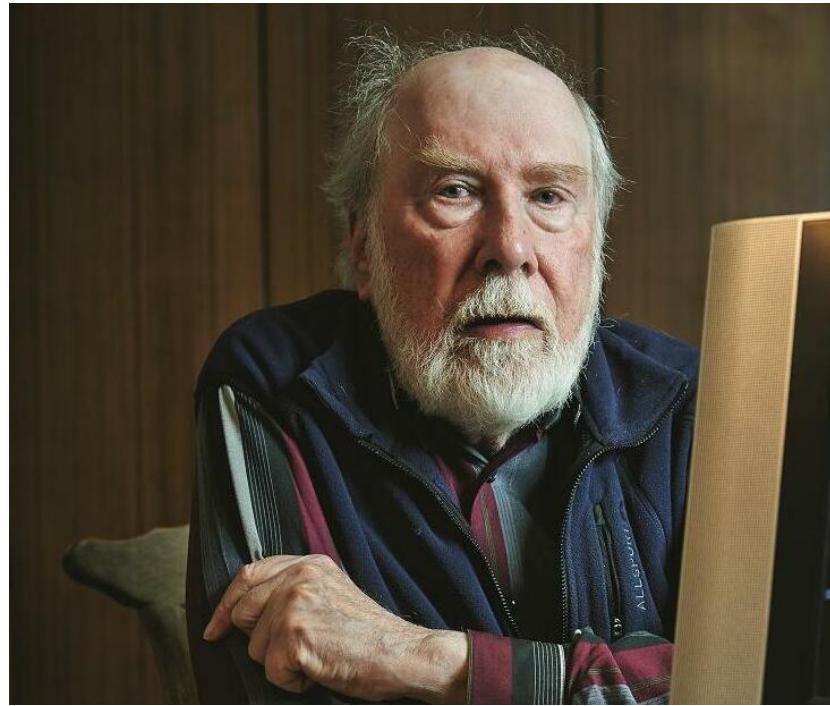
This project was approved by Gabriele Bavota prof. at Software Atelier 1

October 19 - November 19 2020 Universita della Svizzera italiana Faculty of Informatics
Switzerland

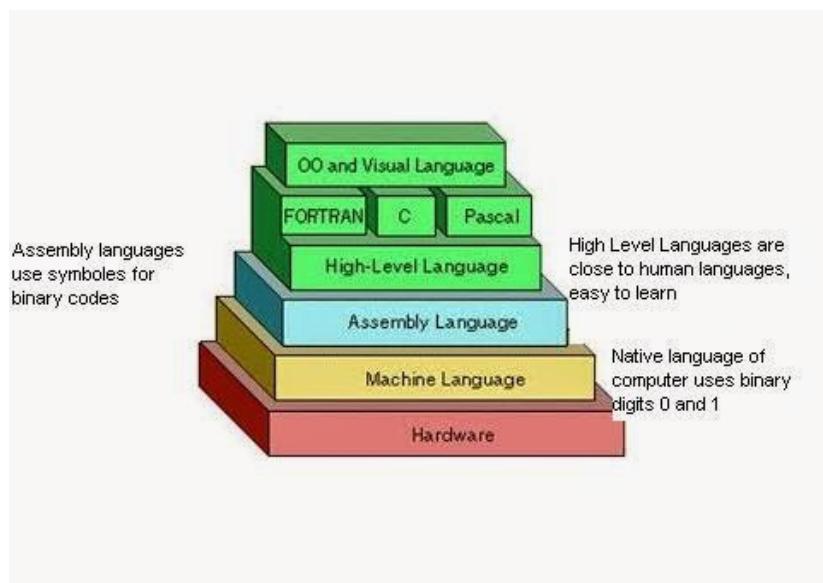
The Pascal programming language



Niklause Wirth



”People look at programming languages like religions:if you belong to one, you can’t belong to others.”
Niklaus Wirth1980s







```
__="hugo"
__="$25 mai 2011 19:14:28$"
fch(path,dir,i,taille): def search(path,dir,i,taille):def search(path,dir,i,taille):
    fction principale. Paramètres : chemin du fichier, dossier de travail, itération n°,
    - path.replace(dir,"") def search(path,dir,i,taille):
        g = name.replace(".avi","",).replace(" ","_").lower()
        url = "http://www.mipomik.fr/recherche/?q={0}&format(string)"
        = urllib2.Request(url) string = name.replace(".avi","",).replace(" ","_").lstring =
        .replace(".avi","",).replace(" ","_").l
        dle = urllib2.urlopen(req)
        cept IOError, e: string = name.replace(".avi","",).replace(" ","_").lstring = name.rep
        .avi","",).replace(" ","_").l
        if hasattr(e, 'reason'): echo "muslimgalerie.blogspot.com";
        print 'Nous avons échoué à joindre le serveur.'
        print 'Raison: ', e.reason
        elif hasattr(e, 'code'):
            print 'Code d\'erreur: ', e.code
            print 'Code d\'erreur: ', e.code
            print 'Code d\'erreur: ', e.read()
```

The outstanding success of the Pascal language is due to several reasons: The language naturally reflected the most important modern concepts of software development technology.

It is due to its compactness, integrity and orthogonality of concepts that the Pascal programming language turned out to be very easy to learn and master. Despite the apparent simplicity of the language, it turned out to be suitable for a fairly wide range of applications, for the development of very large and complex programs, even operating systems.

Pascals great leap into mainstream use came a few years later, with the spread of personal computers. The simplicity and efficiency of Pascal made it a natural fit to their limited memory and disk space. Borlands cheap and fast Turbo Pascal compiler cemented Pascals position as the leading high level computer language of the 1980s for serious personal computer software development.

A programming language called Pascal is described which was developed on the basis of Algol 60. Compared to Algol 60, its range of applicability is considerably increased due to a variety of data structuring facilities. In view of its intended usage both as a convenient basis to teach programming and as an efficient tool to write large programs, emphasis was placed on keeping the number of fundamental concepts reasonably small, on a simple and systematic language structure, and on efficient implement ability. A one-pass compiler has been constructed for the CDC 6000 computer family.

Pascal is quite technologically advanced for implementation for almost all (including non-traditional) machine textures. There is an interesting comparison: the development of a Pascal-translator hardly exceeds in labor intensity a good thesis of a university graduate.

Interesting things about the Pascal programming language



If you want a language that tries to lock up all the sharp objects and fire-making implements, use Pascal or Ada: the Nerf languages, harmless fun for children of all ages, and they won't mar the furniture.

— Scott Fahlman —

AZ QUOTES

What do people talk about on Skype?



3%
Hi, how are you?

97%
Can you hear me?

There are only two ways to
write error-free programs.
The third way works.

Blaise Pascal The Pascal programming language was named after Blaise Pascal, a French physicist, mathematician and inventor turned philosopher.

Blaise Pascal The Pascal programming language was named after Blaise Pascal, a French physicist, mathematician and inventor turned philosopher.

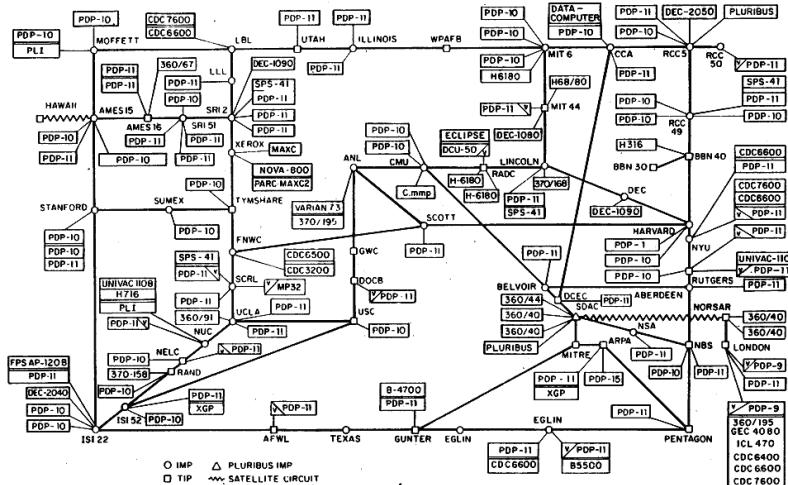
Harmless fun Pascal allows the programmers to define complex structured data types and build dynamic and recursive data structures, such as lists, trees and graphs. Pascal offers features like records, enumerations, subranges, dynamically allocated variables with associated pointers and sets.

Among the most amazing implementations of Pascal Among the most amazing implementations of Pascal are: Skype, Total Commander, TeX, Macromedia Captivate, Apple Lisa, Various PC Games, Embedded Systems

The third way works One of the reasons why the early Turbo Pascal was a huge success was the speed of the compiler. Even on older hardware code was compiled in a few seconds. In comparison to other compilers this is still true today. But despite the fast compilation of code, the compiled code itself is very competitive to applications developed in plain C, C++ or Java due to the high optimization for different processor architectures, allowing the program to run at a very high speed and with little memory consumption.

ARPANET

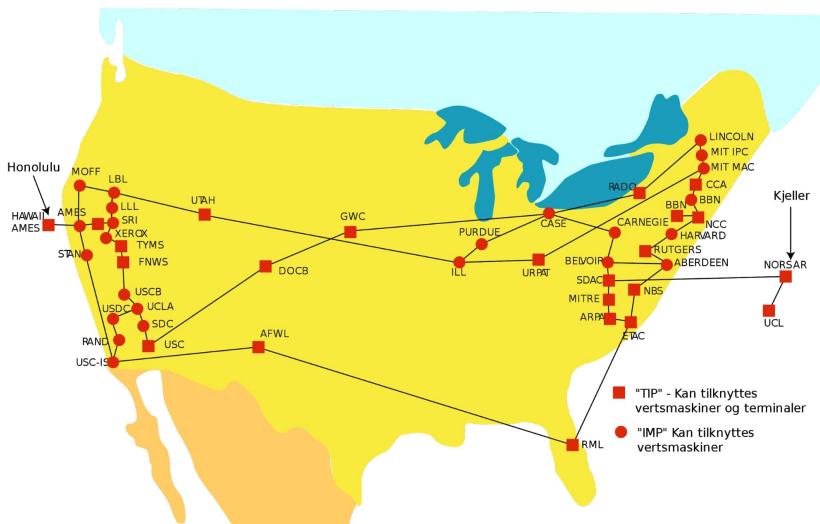
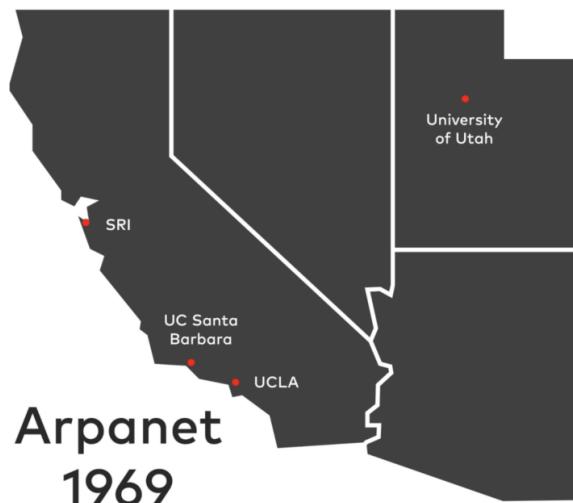
ARPANET LOGICAL MAP, MARCH 1977



Bob Taylor



It's been my goal to work as much as possible, and be as unknown as possible."
Bob Taylor1970s



29 Oct 69	2100	LOADED OP. PROGRAM CSK FOR BEN BARKER BBN
22:30		Talked to SRI Host to Host
		CSIC Left imp. program CSIC running after sending a host dead message to imp.



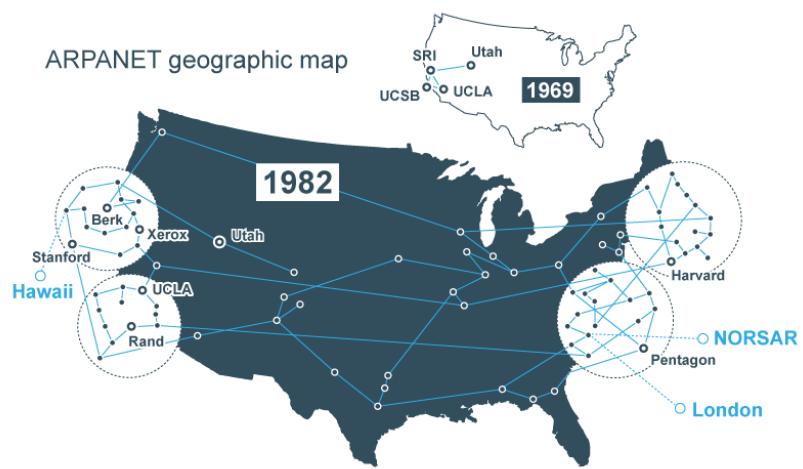
The Advanced Research Projects Agency Network (ARPANET) was the primary wide-region packet-switching network with non-centralised control and one of the first networks to execute the TCP/IP protocol suite. The two advancements were the first important steps to create the foundations of the internet. The ARPANET network was set up by the Advanced Research Projects Agency (ARPA) of the United States Department of Defense.

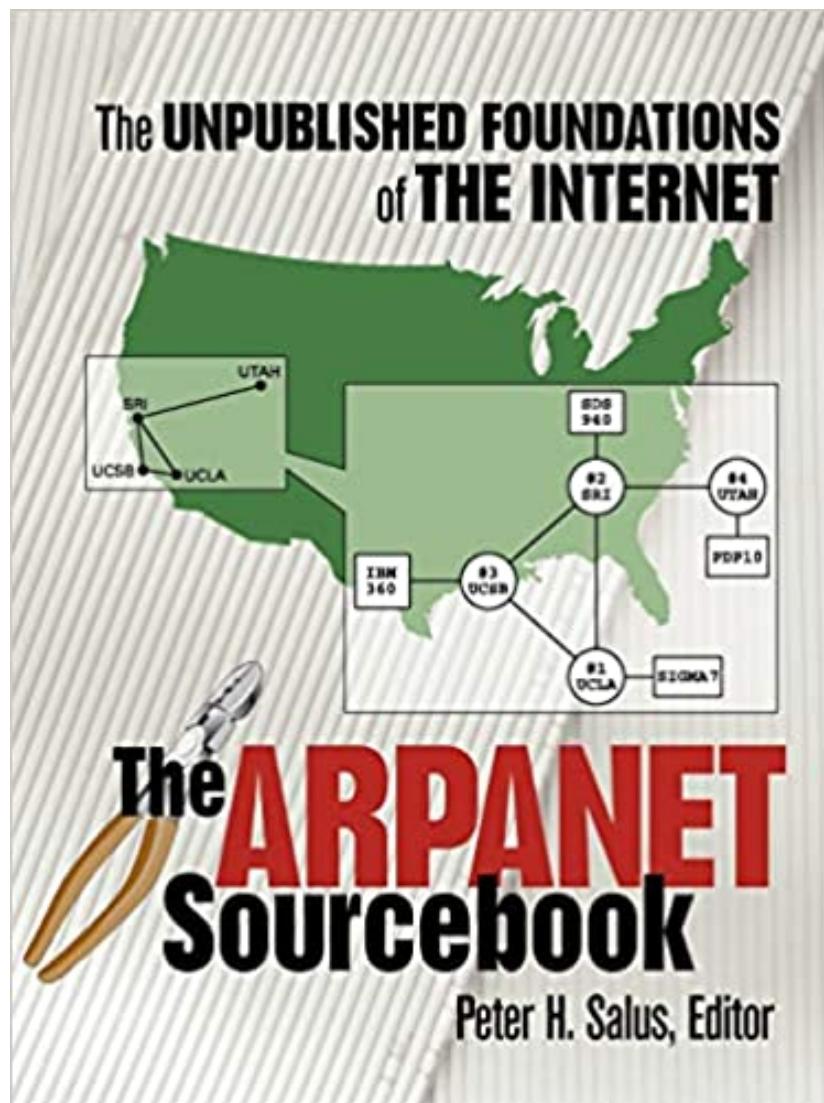
The main nodes were connected in 1969 and the Network Control Program was actualized in 1970. Further programming advancement implemented remote login, file transfer and email. The network extended quickly, building more and more nodes in the United States, and was announced operational in 1975 when control passed to the Defense Communications Agency.

ARPANET was the final result of a decade of computer-communications improvements sustained by military worries that the Soviets may utilize their bombers to dispatch nuclear assaults against the United States.

The first router of the ARPANET network is shown in the picture to the side. Screens weren't used initially to display messages and keyboards weren't the main input device. An analog interface was used to tune the settings of the router and connect it to the other machines in different nodes of the network.

Interesting things about ARPANET





IMP Team

The Interface Message Processor gave a system independent interface to the ARPANET that could be utilized by any computer, accordingly creating the starting point of the Internet network design.

The Americans

"ARPANET" is the seventh episode of the second season of the American TV series 'The Americans', and the twentieth establishment in the whole series. It initially broadcasted on FX in the United States on April 9, 2014.

ARPANET map

ARPANET was very small in his launch in 1969. It also was a closed network until 1979, were only defense researchers could exchange information. It later opened to other types of

communication, including email (which wasn't present in the beginning), and transitioned to the structure of the modern internet in later years, opening to the public.

ARPAnet Sourcebook

The ARPAnet Sourcebook: The Unpublished Foundations of the Internet is a book clarifies the development, the structure, and the outcomes that ARPANET had on the advancement of the World Wide Web. It's a logical examination about what is seemingly the first long-range network to interconnect PCs.

The first optical disc - The LASERDISC



David Paul Gregg



"Had to be extremely low-cost, which implied the utmost simplicity, lowest material and processing costs, and user friendliness.

David Paul Greff 1978s





LaserDisc did not have high market penetration in North America due to the high cost of the players and discs, which were far more expensive than VHS players and tapes, and due to marketplace confusion with the technologically inferior CED, which also went by the

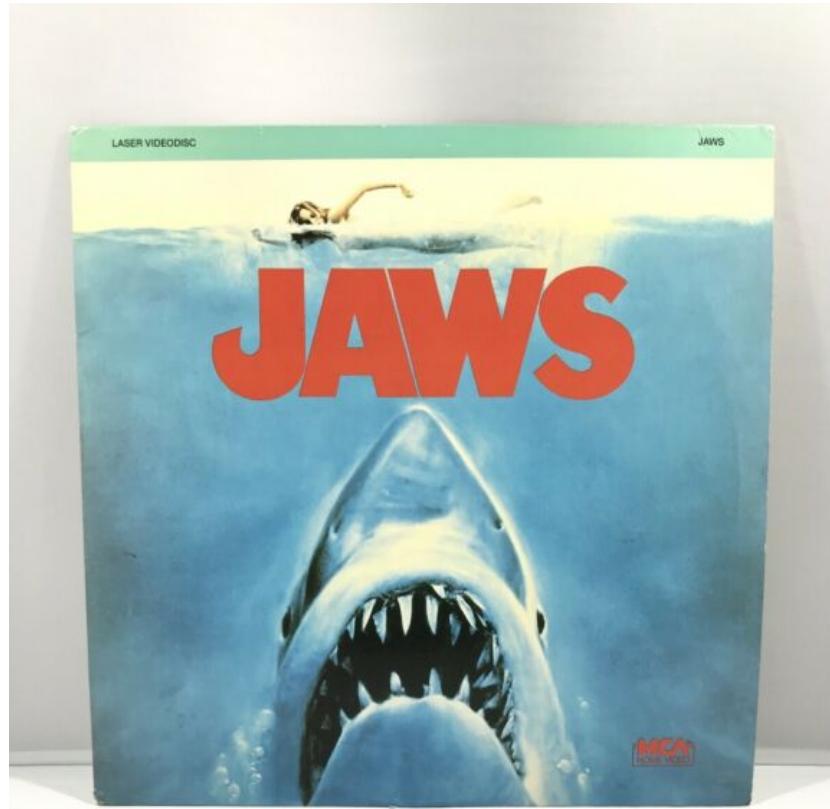
name Videodisc. While the format was not widely adopted by North American consumers, it was well received among videophiles due to the superior audio and video quality compared to VHS and Betamax tapes, finding a place in nearly one million American homes by the end of 1990.

The format was more popular in Japan than in North America because prices were kept low to ensure adoption, resulting in minimal price differences between VHS tapes and the higher quality LaserDiscs, helping ensure that it quickly became the dominant consumer video format in Japan. Anime collectors in every country in which the LD format was released, which included both North America and Japan, also quickly became familiar with this format, and sought the higher video and sound quality of LaserDisc and the availability of numerous titles not available on VHS. LaserDiscs were also popular alternatives to videocassettes among movie enthusiasts in the more affluent regions of South East Asia, such as Singapore, due to their high integration with the Japanese export market and the disc-based media's superior longevity compared to videocassette, especially in the humid conditions endemic to that area of the world.

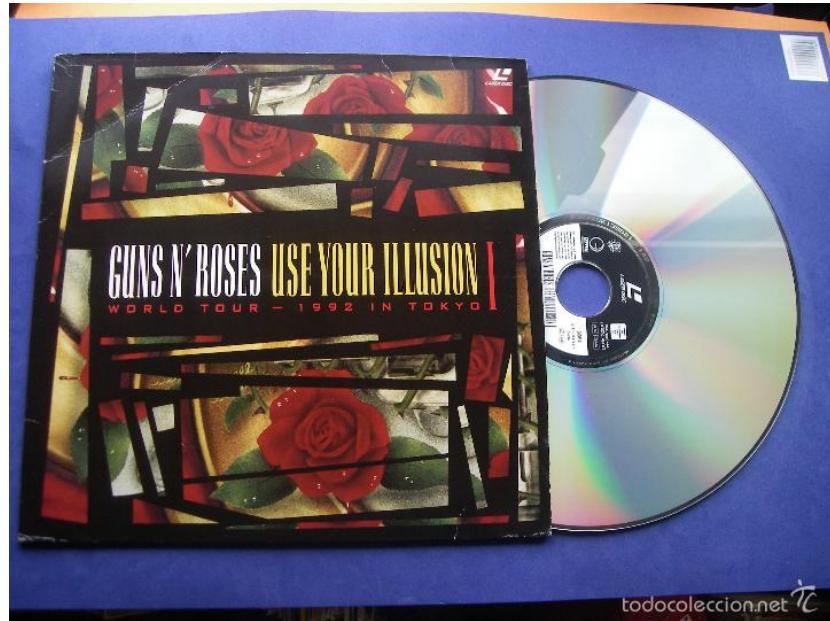
The format also became quite popular in Hong Kong during the 1990s before the introduction of VCDs and DVD; although people rarely bought the discs (because each LD was priced around US\$100), high rental activity helped the video rental business in the city grow larger than it had ever been previously. Due to integration with the Japanese export market, NTSC LaserDiscs were used in the Hong Kong market, in contrast to the PAL standard used for broadcast (this anomaly also exists for DVD). This created a market for multi-system TVs and multi-system VCRs which could display or play both PAL and NTSC materials in addition to SECAM materials (which were never popular in Hong Kong). Some LD players could convert NTSC signals to PAL so that most TVs used in Hong Kong could display the LD materials.

Despite the relative popularity, manufacturers refused to market recordable LaserDisc devices on the consumer market, even though the competing VCR devices could record onto cassette, which hurt sales worldwide. The inconvenient disc size, the high cost of both the players and the media and the inability to record onto the discs combined to take a serious toll on sales, and contributed to the format's poor adoption figures. Although the LaserDisc format was supplanted by DVD by the late 1990s, many LD titles are still highly coveted by movie enthusiasts (for example, Disney's Song of the South which is unavailable in the US in any format, but was issued in Japan on LD). This is largely because there are many films that are still only available on LD and many other LD releases contain supplementary material not available on subsequent DVD versions of those films. Until the end of 2001, many titles were released on VHS, LD and DVD in Japan.

Interesting things about Laserdisc







First Laserdisc

The first LaserDisc title marketed in North America was the MCA DiscoVision release of Jaws on December 15, 1978. Jaws was the prototypical summer blockbuster, regarded as a watershed moment in motion picture history, and it won several awards for its music and editing. It was the highest-grossing film until the release of Star Wars in 1977.

Laserdisc Turtle

Pioneer Electronics also entered the optical disc market in 1977. On single sided LaserDiscs mastered by Pioneer, playing the wrong side will cause a still screen to appear with a happy, upside down turtle that has a LaserDisc for a stomach (nicknamed the "LaserDisc Turtle").

The words "Program material is recorded on the other side of this disc" are below the turtle. Other manufacturers used a regular text message without graphics.

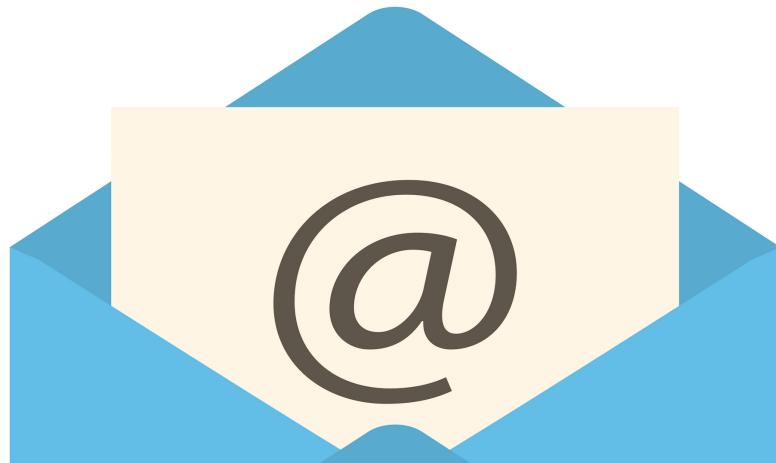
Dragon's Lair

The format's instant-access capability made it possible for a new breed of LaserDisc-based video arcade games and several companies saw potential in using LaserDiscs for video games in the 1980s and 1990s, beginning in 1983 with Sega's Astron Belt. American Laser Games and Cinematronics produced elaborate arcade games that used the random-access features to create interactive movies such as Dragon's Lair and Space Ace. Similarly, the Pioneer Laseractive and Halcyon were introduced as home video game consoles that used LaserDisc media for their software.

Guns N Roses - Use your illusion Laserdisc

The disk Guns N Roses - Use your illusion 1992 World Tour in Tokio was made as a laserdisc since the popularity of laserdisc in Japan.

Email

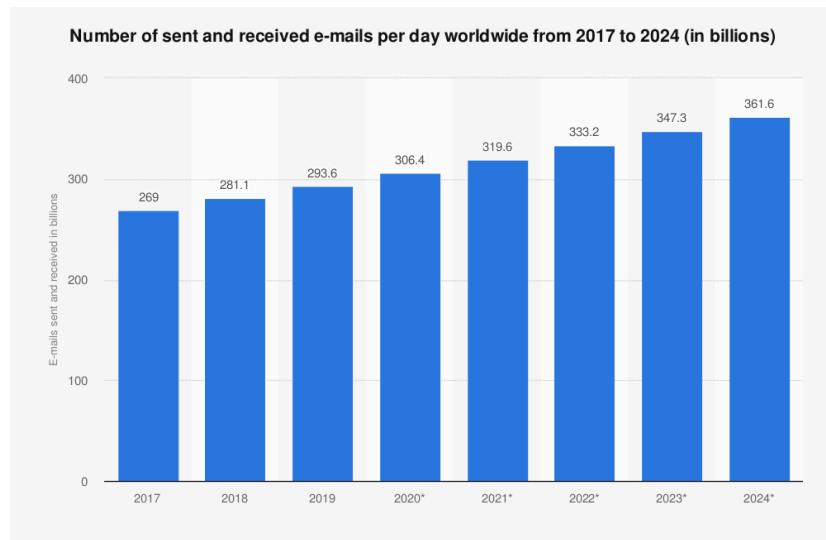


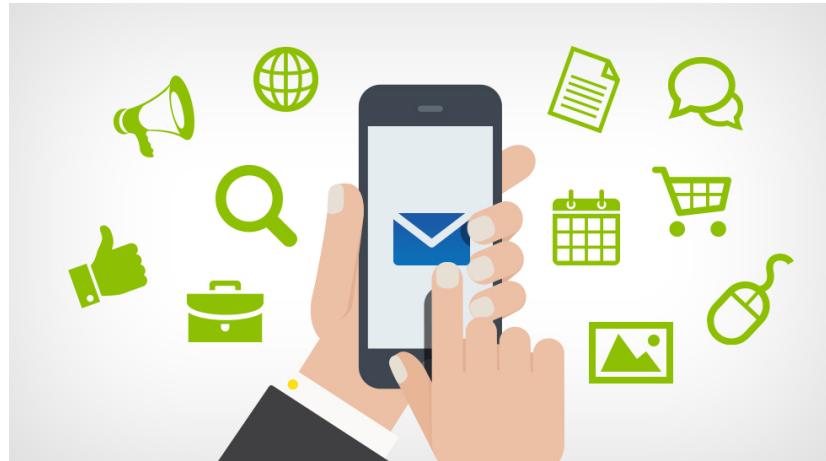
Ray Tomlinson



I see email being used, by and large, exactly the way I envisioned. In particular, it's not strictly a work tool or strictly a personal thing. Everybody uses it in different ways, but they use it in a way they find works for them.

Raymond Tomlinson





The number of email users reached the 3.9 billion mark, which means that over 50% of the world's population is now using email. During 2020, around 306.4 billion emails were sent and received each day. This is a huge number, however, the figures are expected to increase to over 361.6 billion daily mails in 2024.

Emails have been implemented in the daily use of businesses, governments and non-governmental organizations in the developed world. Email is one of the main parts of an 'e-revolution' that is currently happening in workplace communication (with another main part being the spreading of high speed internet use). A survey done in 2010 on workplace communication showed that 83% of U.S. knowledge workers felt that email played a big part in their success and productivity at work.

Email has become available and used on smartphones and on all types of computers. Mobile applications for email increase the accessibility to email for people who cannot use a computer or are out of their home. While during the starting years of email, users could only access email on desktop computers, nowadays, users can check their email anywhere and at anytime through their mobile phone. Notifications and alerts can also be sent to the device of the user to notify them immediately of any new emails. This has made possible

that email is used for more frequent communication between users and made possible for them to check their email and write emails throughout the day.

There are many companies offering their email services to customers that picking one is becoming a challenge. While selecting an email service provider, there are many factors to take in, like: storage, user-friendliness, spam filters, and mobile access.

If you need an email client for business use, then the features you should look out for are the storage, the maximum attachment size allowed, security options, archiving capabilities, and other advanced features like task scheduling, etc.

If you need an email client for personal use, then the features you should look out for are a good spam blocking filter, virus protection, storage, and ease of use.

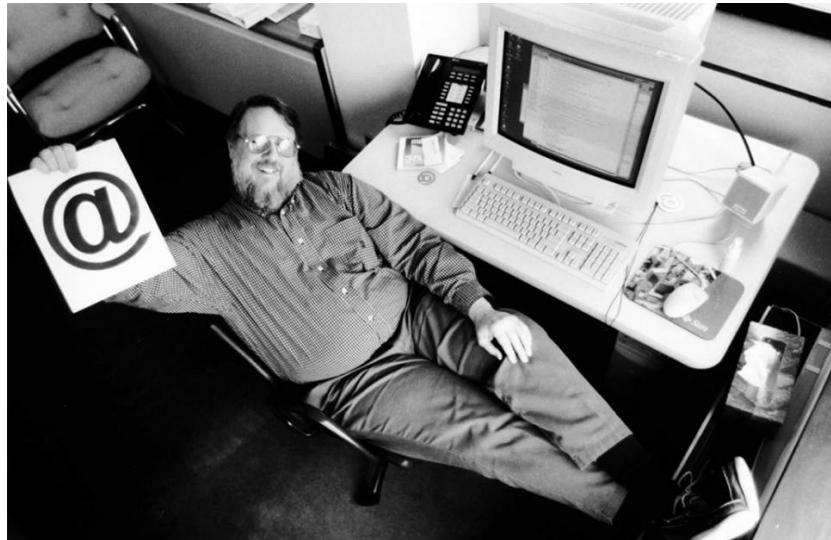
Fun facts about the Email



email

vs

e-mail



The world's first email was sent in 1971.

The man who sent it said it was “entirely forgettable” such as :

“QWERTYUIOP”

”@” Key Position I am amused when somebody tries to illustrate the first email using a modern keyboard and a finger reaching for the '2' key. Wrong key! The @ was next to the 'P' key. - Ray Tomlinson

E-mail or Email Tomlinson himself said he preferred "email" over "e-mail", he said jokingly in a 2010 interview that "I'm simply trying to conserve the world's supply of hyphens" and that "the term has been in use long enough to drop the hyphen".

The First Email The first email ever sent was in 1971. Ray Tomlinson, the engineer who invented the email program on the ARPANET system, sent the message to himself and received it on a computer sitting right next to him.

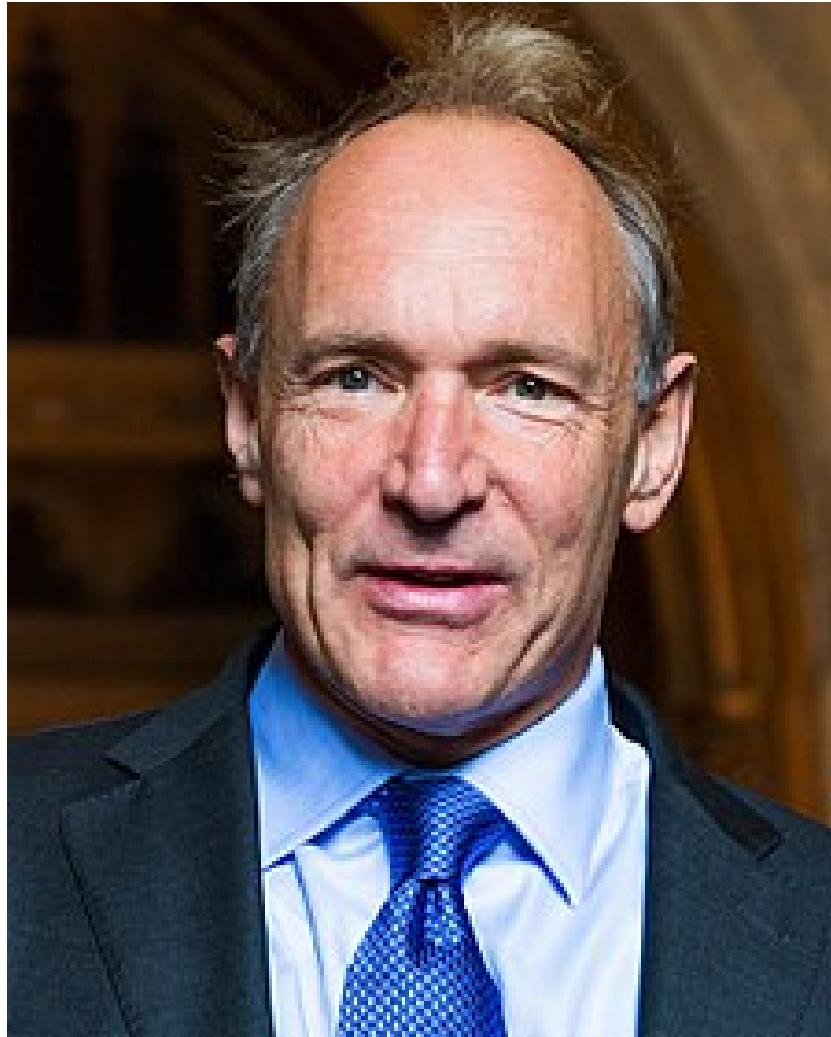
The Content Of The First Email The first email that Tomlinson ever sent was a test. It was not preserved and Tomlinson describes it as insignificant, something like "QWERTYUIOP". This is commonly misconceived as "The first e-mail was QWERTYUIOP". Tomlinson later commented that these "test messages were entirely forgettable and I have, therefore, forgotten them."

1 1981-1990

The World Wide Web



Tim Berners-Lee



”The Web does not just connect machines, it connects people.”
Tim Berners-Lee September 14, 2008.

CERN DD/OC
Information Management: A Proposal

Tim Berners-Lee, CERN/DD

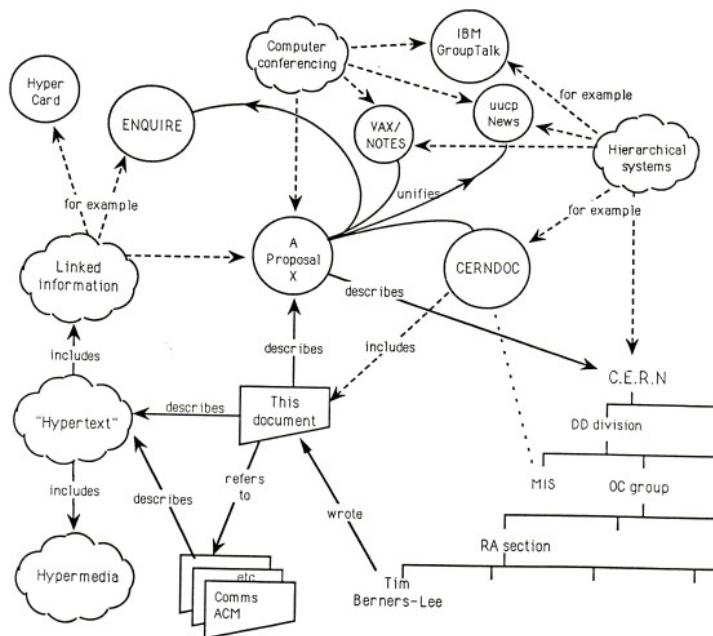
March 1989

Information Management: A Proposal

Abstract

This proposal concerns the management of general information about accelerators and experiments at CERN. It discusses the problems of loss of information about complex evolving systems and derives a solution based on a distributed hypertext system.

Keywords: Hypertext, Computer conferencing, Document retrieval, Information management, Project control



← → ⌂ ⌂ info.cern.ch/hypertext/WWW/TheProject.html

World Wide Web

The WorldWideWeb (W3) is a wide-area [hypermedia](#) information retrieval initiative aiming to give universal access to a large universe of documents.

Everything there is online about W3 is linked directly or indirectly to this document, including an [executive summary](#) of the project, [Mailing lists](#), [Policy](#), November's [W3 news](#), [Frequently Asked Questions](#).

- [What's out there?](#)
Pointers to the world's online information, [subjects](#), [W3 servers](#), etc.
- [Help](#)
on the browser you are using
- [Software Products](#)
A list of W3 project components and their current state. (e.g. [Line Mode](#), [X11 Viola](#), [NeXTStep](#), [Servers](#), [Tools](#), [Mail robot](#), [Library](#))
- [Technical](#)
Details of protocols, formats, program internals etc
- [Bibliography](#)
Paper documentation on W3 and references.
- [People](#)
A list of some people involved in the project.
- [History](#)
A summary of the history of the project.
- [How can I help?](#)
If you would like to support the web..
- [Getting code](#)
Getting the code by [anonymous FTP](#), etc.



It all began in 1980, when Tim Berners-Lee was hired at CERN as a consultant in the field of software engineering. Right from the start, he focused on how to make information, which was constantly and rapidly increasing at CERN, storable and usable. In 1989 he presented a document entitled Information Management: a Proposal. In this paper he explains how, based on the work he was doing with his colleague Robert Cailliau, the internet could be used to share scientific documentation in electronic format. The goal was to improve sharing and cooperation between the institute's researchers. He personally developed, on his Next Cube, the first Web server and the first browser, exploiting the idea of hypertext (theoretically introduced by Ted Nelson in 1965).

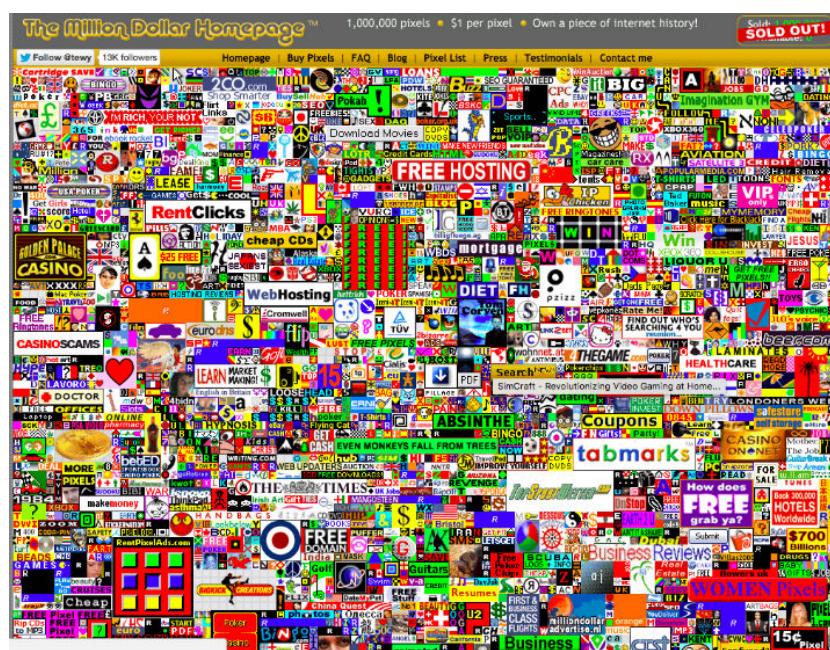
In October of 1990, Tim Berner-Lee invented three essential technologies that remain at the base of today's web : HTML: HyperText Markup Language. This hypertext system initiated the evolution of information disclosure, as it made it possible to move from one topic to another (or from one page to another) with ease, through links. URI: Uniform Resource Identifier. An electronic address that allows the identification and location of a page, or a resource (images, videos, other files) searched by the user online. It is also commonly called a URL. HTTP: Hypertext Transfer Protocol. Allows for the retrieval of linked resources from across the web.

On August 6, 1991, Tim Berners Lee published the first website at CERN. This site had an informative-explanatory purpose, describing the Web and how to use it. In 1993, the National Center for Supercomputing Applications, NCSA, of the University of Illinois released the first version of the Mosaic browser, which achieved an appreciable level of popularity. The spread of increasingly reliable and easy-to-use browsers, such as Netscape and Navigator, facilitated the expansion of the World Wide Web. At that time there were more than 500 known web servers and the WWW reached 1% of Internet traffic. CERN organized the first international conference of the World Wide Web, which was attended by 400 users and developers. The impact that the web had on the media was enormous.

The World Wide Web, revolutionized the way humans communicate and share data with each other. The ability to easily access any type of content guarantees many opportunities that were not even imagined before, and facilitates people's daily lives. Not only that: social networks and the ability to communicate easily are only possible thanks to the web. Exchanging and accessing information in such a simple way allows you to promote culture and knowledge. Immediate communication between people removes any boundaries or distances and allows progress to take its course.

Interesting things about the World Wide Web







First Image

The first image ever shared was uploaded by Tim Berners-Lee in 1992. The image is a picture of a musical comedy group known as "Les Horribles Cernettes". All members of the group were scientists and significant personalities of CERN. The first photo to ever be uploaded to the web is pretty bad, from all points of view.

Difference Internet and WWW

Most people tend to treat the Internet and the Web as synonymous. In reality there is a profound difference between the two words. The Internet is the infrastructure that allows you to transfer data. The World Wide Web, on the other hand, more commonly known by the acronym WWW, is one of the internet services that allows the transfer and display of data in the form of hypertext. Everything we normally see on our browser.

Million Dollar Homepage

In 2005 Alex Tew, a student from Wiltshire, England, conceived The Million Dollar Homepage in order to raise money for his university education. The home page had a very simple header and footer and, between these lines of text, he placed a 1000 1000 image. He then began selling portions that measured 10 10 pixels to anyone who wanted to buy one. Each portion cost \$ 100. Buyers could use the space for any (lawful) purpose, and the most reasonable result was that the buyers intended to advertise their website.

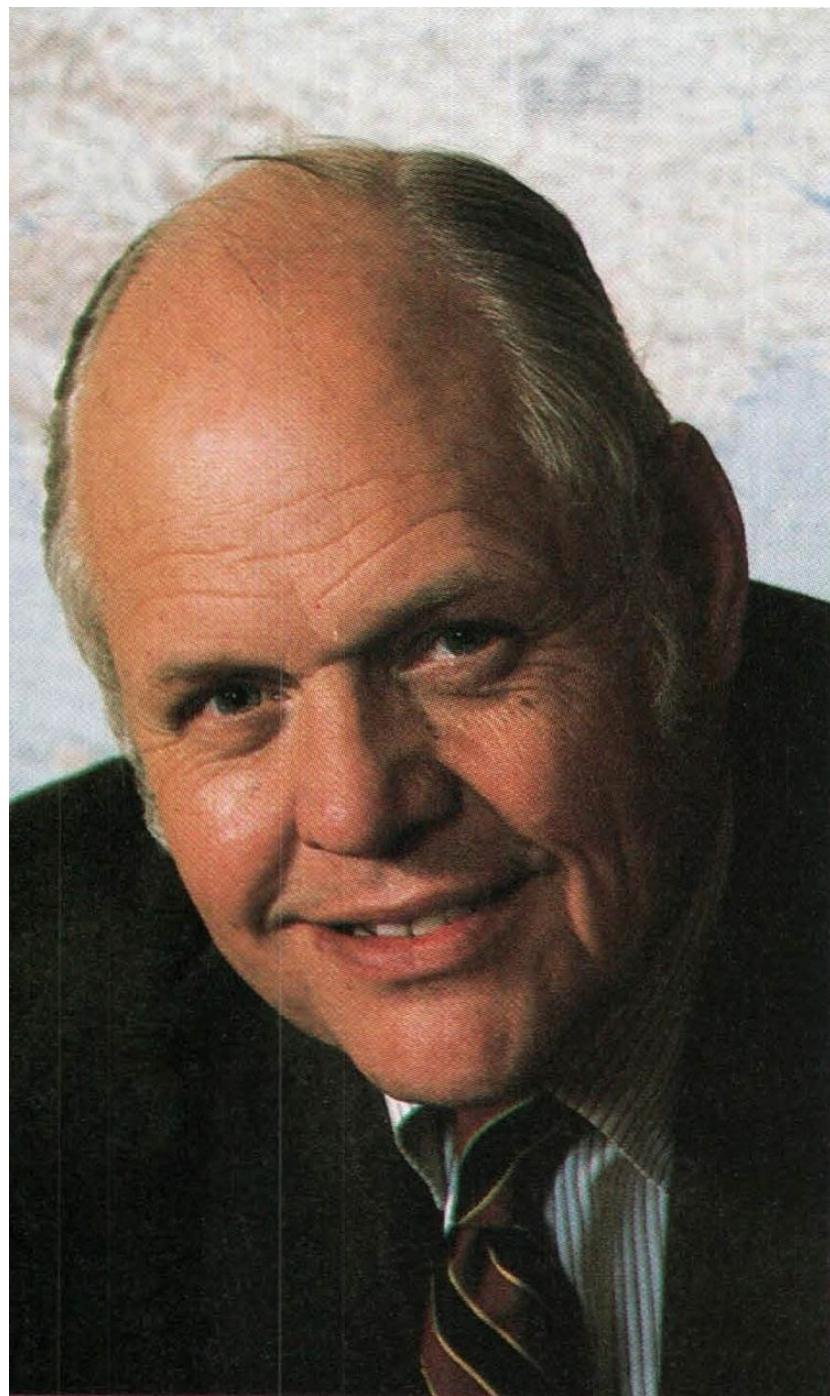
The World Wide Web Almost Had a Very Different Name

The World Wide Web wasn't the first name Tim Berners Lee thought for his project. The first three names that were up for consideration were Mine of Information", "The Information Mine" and "The Mesh. Ultimately, The Mesh was thrown away due to its closeness in pronunciation to the word mess, while Mine of Information and The Information Mine were discarded because of the narcissistic nature of their acronyms (TIM, like its creator, and moi, French for I.) Thankfully, good sense prevailed and the name World Wide Web was picked as the final standing!

The PC Boom



Pc Boom



"There is no reason, for any individual to have a computer in his home.
Ken Olsen 1980s





The IBM Personal Computer (model 5150, commonly known as the IBM PC) is the first computer released in the IBM PC model line and the basis for the IBM PC compatible de facto standard. Released on August 12, 1981, it was created by a team of engineers and designers directed by Don Estridge in Boca Raton, Florida. The machine was based on open architecture and a substantial market of third-party peripherals, expansion cards and software grew up rapidly to support it. The PC had a substantial influence on the personal computer market. The specifications of the IBM PC became one of the most popular computer design standards in the world, and the only significant competition it faced from a non-compatible platform throughout the 1980s was from the Apple Macintosh product line.

The majority of modern personal computers are distant descendants of the IBM PC.

The Commodore 64, also known as the C64 or the CBM 64, is an 8-bit home computer introduced in January 1982 by Commodore International (first shown at the Consumer

Electronics Show, in Las Vegas, January 710, 1982). It has been listed in the Guinness World Records as the highest-selling single computer model of all time, with independent estimates placing the number sold between 12.5 and 17 million units. Volume production started in early 1982, marketing in August for US\$595 (equivalent to \$1,576 in 2019). Preceded by the

Commodore VIC-20 and Commodore PET, the C64 took its name from its 64 kilobytes (65,536 bytes) of RAM. With support for multicolor sprites and a custom chip for waveform generation, the C64 could create superior visuals and audio compared to systems without such custom hardware. The C64 dominated the low-end computer market (except in the UK) for most of the 1980s. For a substantial period (1983–1986), the C64 had between 30% and 40% share of the US market and two million units sold per year, outselling IBM PC compatibles, Apple computers, and the Atari 8-bit family of computers. Sam Tramiel, a later Atari president and the son of Commodore's founder, said in a 1989 interview, "When I was at Commodore we were building 400,000 C64s a month for a couple of years." In the UK market, the C64 faced competition from the BBC Micro and the ZX Spectrum, but the C64 was still the second most popular computer in the UK after the ZX Spectrum.

Lisa is a desktop computer developed by Apple, released on January 19, 1983. It is one of the first personal computers to present a graphical user interface (GUI) in a machine aimed at individual business users. Development of the Lisa began in 1978, and it underwent many changes during the development period before shipping at US\$9,995 with a five-megabyte hard drive. The Lisa was challenged by a relatively high price, insufficient software library,

unreliable Apple FileWare ("Twiggy") floppy disks, and the immediate release of the cheaper and faster Macintosh yielding lifelong sales of only 10,000 units in two years. In

1982, after Steve Jobs was forced out of the Lisa project, he appropriated the existing Macintosh project, which Jef Raskin had conceived in 1979 and led to develop a text-based appliance computer. Jobs immediately redefined Macintosh as a cheaper and more usable version of the graphical Lisa. Macintosh was launched in January 1984, quickly surpassing

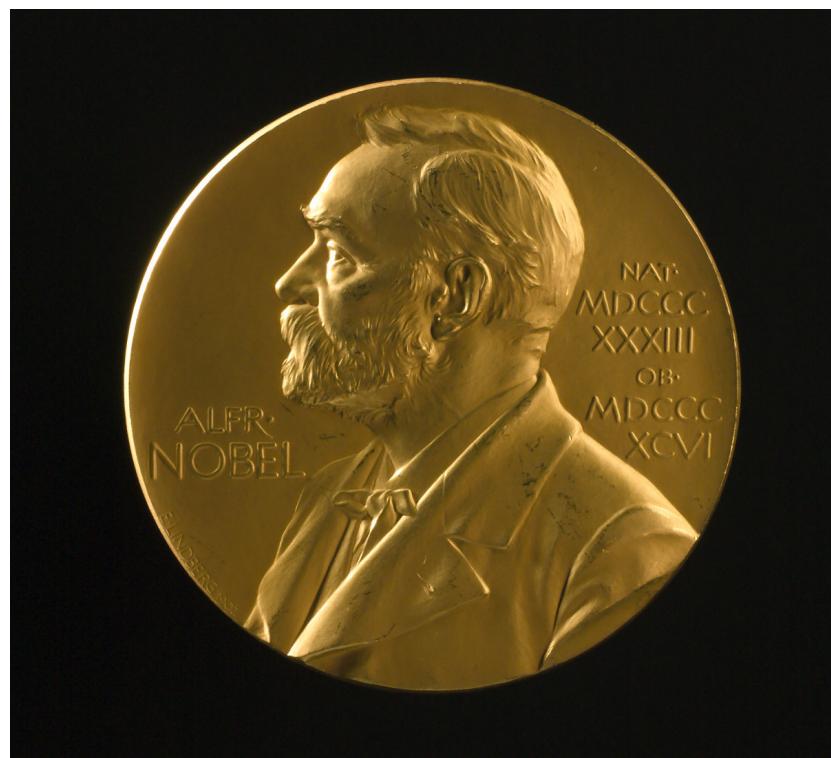
Lisa sales, and assimilating increasing numbers of Lisa staff. Newer Lisa models were introduced that addressed its faults and lowered its price considerably, but the platform failed to achieve favorable sales compared to the much less expensive Mac. The final model, the Lisa 2/10, was modified as the high end of the Macintosh series, the Macintosh XL. Considered a commercial failure but with technical acclaim, the Lisa introduced a number of advanced features that would not reappear on the Macintosh or the "PC" platform for many years. Among those is an operating system with protected memory and a more document-oriented workflow.

The Macintosh 128K, originally released as the Apple Macintosh, is the original Apple Macintosh personal computer. Its beige case consisted of a 9 in (23 cm) CRT monitor and came with a keyboard and mouse. A handle built into the top of the case made it easier for the computer to be lifted and carried. It had an initial selling price of \$2,495 (equivalent to \$6,140 in 2019). The Macintosh was introduced by the now-famous \$370,000 (equivalent to \$910,541 in 2019) television commercial directed by Ridley Scott, "1984", that aired on CBS during the third quarter of Super Bowl XVIII on January 22, 1984. Sales of the Macintosh were strong from its initial release on January 24, 1984, and reached 70,000 units on May 3, 1984. Upon the release of its successor, the Macintosh 512K, it was rebranded as the

Macintosh 128K. The computer is Model M0001. The heart of the computer was a Motorola 68000 microprocessor running at 7.8336 MHz, connected to 128 KB RAM shared by the processor and the display controller. The boot procedure and some operating system routines were contained in an additional 64 KB ROM chip. Apple did not offer RAM upgrades. Unlike the Apple II, no source code listings of the Macintosh system ROMs were offered. The RAM in the Macintosh consisted of sixteen 4164 64k1 DRAMs. The 68000 and video controller took turns accessing DRAM every four CPU cycles during display of the frame buffer, while the 68000 had unrestricted access to DRAM during vertical and horizontal blanking intervals. Such an arrangement reduced the overall performance of the CPU as much as 35% for most code as the display logic often blocked the CPU's access to RAM. This caused the computer to run slower than several of its competitors, despite the nominally high clock rate.

Things you didn't know about IBM







Its computers helped put the first man on the moon.

Deeply involved in the Apollo missions, IBM assigned over 4,000 employees to man computer systems to help NASA track the orbital flight of the Mercury astronauts. The computers had around 4K of ram, which is half the size of this article in a plain text document.

Five IBM employees won the Nobel Peace Prize.

A handful of IBMers have been rewarded with the worlds most prestigious award for their technical breakthroughs in research and science. The list includes Leo Esaki (semiconductors); George Bednorz and Alex Bueller (superconductivity research); and Gerd Binning and Heinrich Rohrer (scanning tunneling microscope). If you know what that stuff means, good for you!

Modern gaming console are powered by its CPUs.

Every wondered how games like Gears of War, Super Mario Galaxy or Uncharted were even made playable? Look underneath the hood of your Microsoft Xbox 360, Nintendo Wii or Sony PS3 and notice the companys processors served as driving force of these machines.

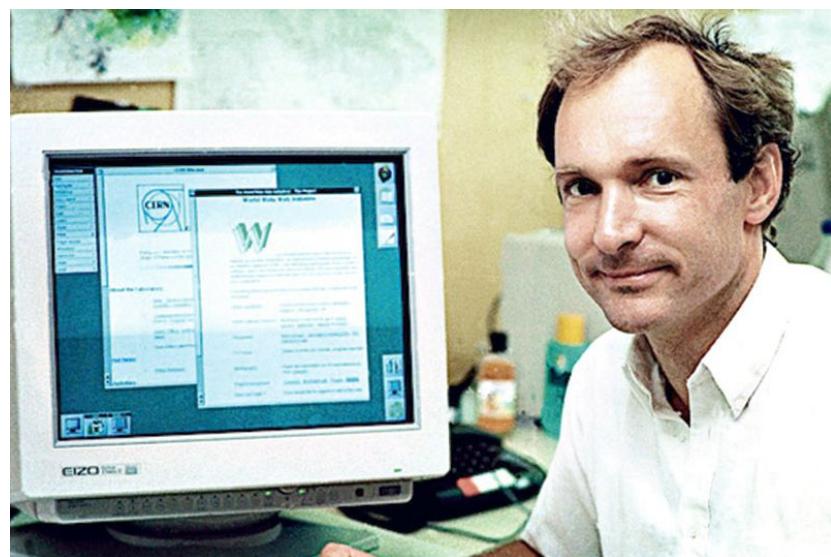
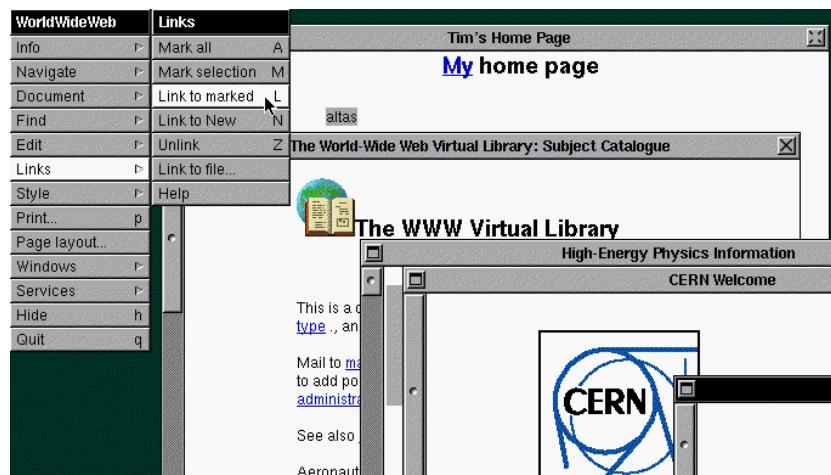
IBM technology played a role during the Holocaust.

According to author Edwin Black, who wrote the book IBM and the Holocaust, the company assisted Hitlers Third Reich by leasing and servicing over 2,000 of its multi-machine sets. IBM also developed a punch card machine used by the Nazis that supposedly allowed them to automate the persecution of the Jews.

Programming Languages



"Sometimes, it is more important to have the right problem than the best solution.
Bjarne Stroustrup 1980s





The C++ language is an object-oriented programming language & is a combination of both low-level & high-level language a Middle-Level Language. The programming language was created, designed & developed by a Danish Computer Scientist Bjarne Stroustrup at Bell Telephone Laboratories (now known as Nokia Bell Labs) in Murray Hill, New Jersey. As he wanted a flexible & a dynamic language which was similar to C with all its features, but with additionality of active type checking, basic inheritance, default functioning argument, classes, inlining, etc. and hence C with Classes (C++) was launched.

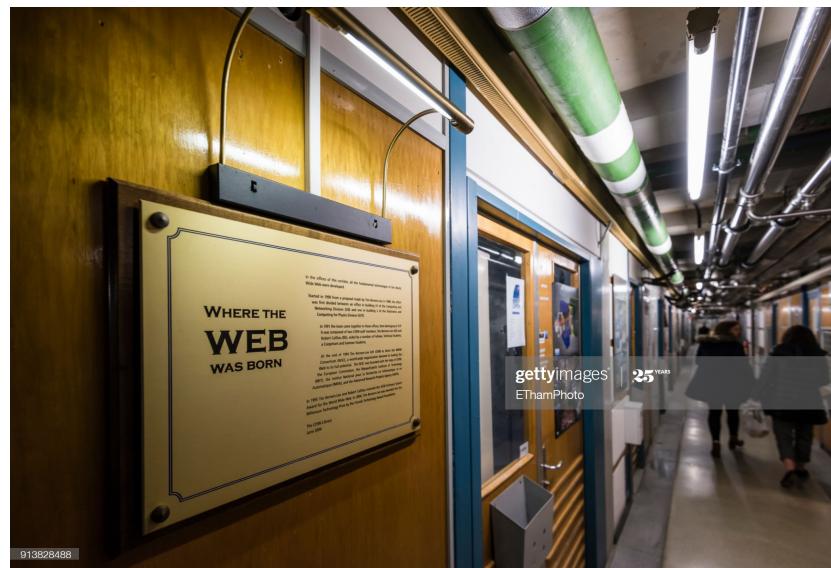
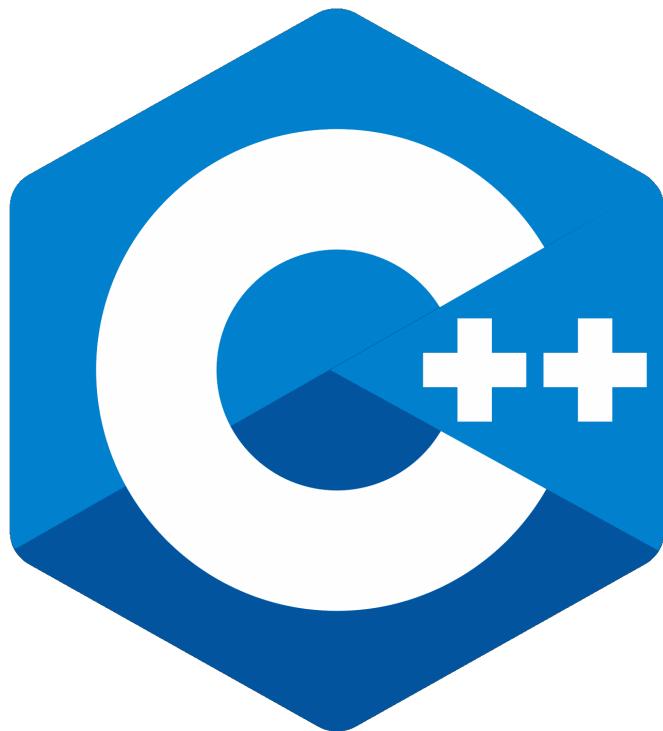
WWW : In 1989, Tim was working in a computing services section of CERN when he came up with the concept; Tim had the idea of enabling researchers from remote sites in the world to organize and pool together information. But far from simply making available a large number of research documents as files that could be downloaded to individual computers, he suggested that you could actually link the text in the files themselves. This would mean that while reading one research paper, you could quickly display part of another paper that holds directly relevant text or diagrams. Documentation of a scientific and mathematical nature would thus be represented as a ‘web’ of information held in electronic form on computers across the world, implementing the use of hypertext.

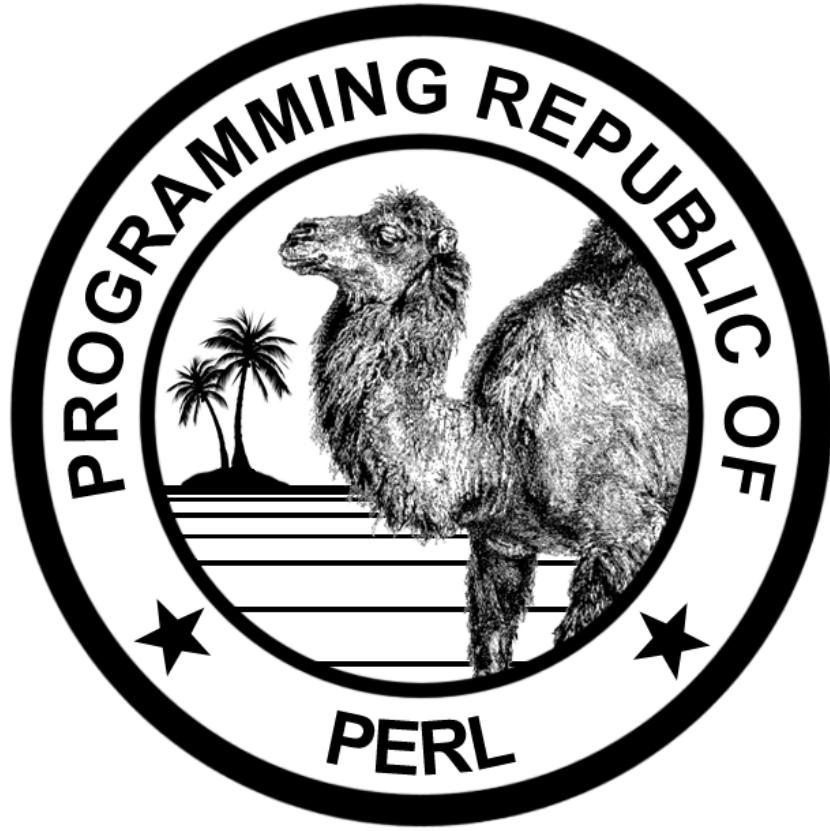
Tim demonstrated a basic, but attractive way of publishing text by developing some software himself, and also his own simple protocol - HTTP - for retrieving other documents' text via hypertext links. Tim's own protocol, HTTP, stands for HyperText Transfer Protocol. The text format for HTTP was named HTML, for HyperText Mark-up Language; Tim bases his HTML on SGML (Standard Generalized Mark-up Language) an existing internationally agreed upon method of text mark-up. Certainly the simplicity of HTML, and the use of the anchor element A for creating hypertext links, was what made Tim's invention so useful.

Perl, a cross-platform, open-source computer programming language, favourite among Web developers for its flexible, continually evolving text-processing and problem-solving capabilities. In December 1987 American programmer and linguist Larry Wall first released Perl 1.0 for computers running the UNIX operating system. This first version was an intuitive, easily coded language for scanning, extracting, and printing information from text

files; in addition, Perl could handle many system management tasks. Perl was a landmark product in advocating the open-source model a collaborative, rather than proprietary, approach to software development.

Interesting Facts





Cfront

The first C with Classes compiler was called Cfront, which was derived from a C compiler called CPre. It was a program designed to translate C with Classes code to ordinary C. A rather interesting point worth noting is that Cfront was written mostly in C with Classes, making it a self-hosting compiler (a compiler that can compile itself).

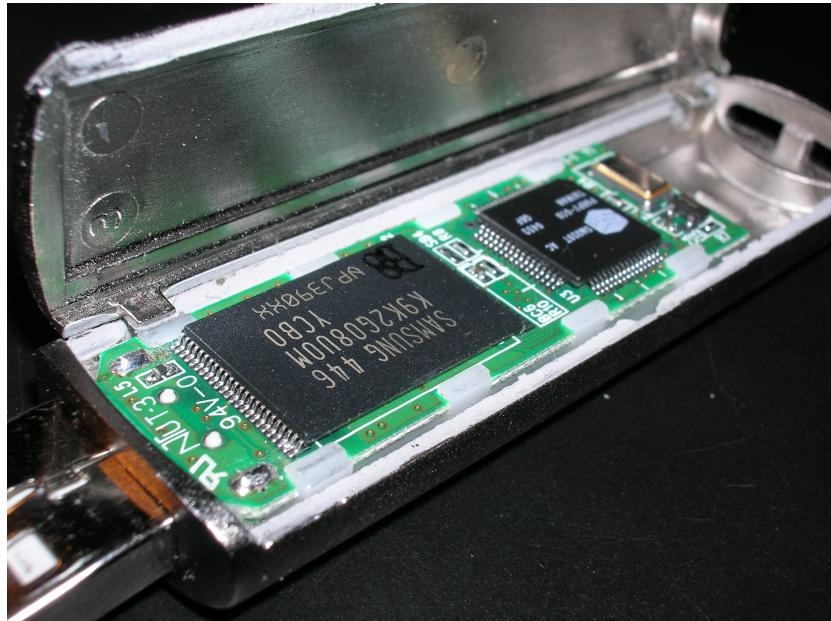
CERN

The World Wide Web began life in the place where you would least expect it: CERN, the European Laboratory for Particle Physics in Geneva, Switzerland. It is a meeting place for physicists from all over the world, where highly abstract and conceptual thinkers engage in the contemplation of complex atomic phenomena that occur on a minuscule scale in time and space. This is a surprising place indeed for the beginnings of a technology which would, eventually, change the world.

Republic of Perl

The official symbol of the Perl language and community is a coin-shaped logo of a camelhead, bearing the text Programming Republic of Perl.. Originally its creator, Larry Wall, had chosen to name it Pearl as a short and meaningful name however just before its release, he discovered that there was already an existing programming language with that name.

Flash memory

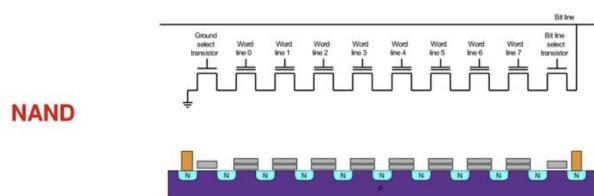
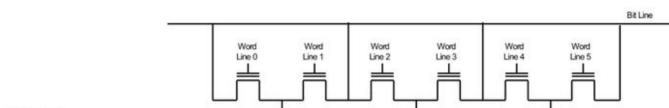
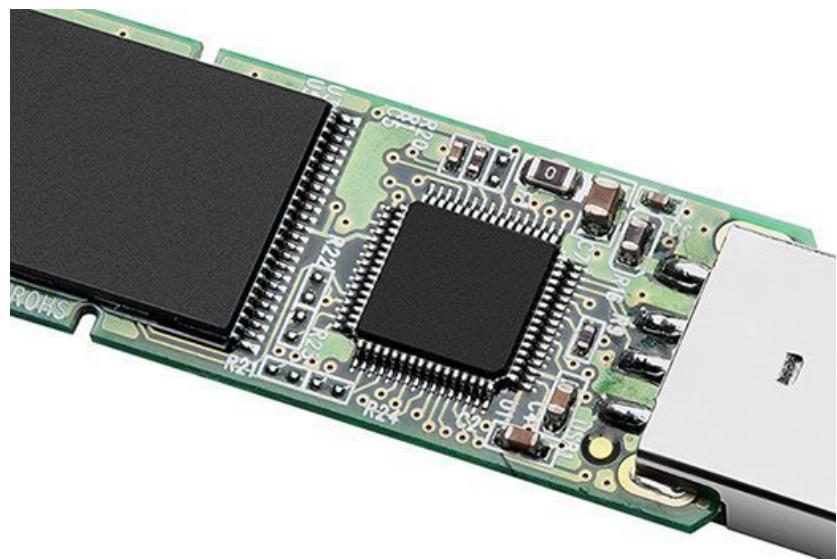


Fujio Masuoka



” I wanted to make a chip that could , one day replace, all other memory technologies on the market”.

Fujio Masuoka1980s





Flash memory is a type of electronically erasable programmable read-only memory (EEPROM), memory chips that retain information without requiring power. Most of the flash memory erases data in whole blocks, making it suitable for use with applications where large amounts of data require frequent updates. Inside the flash chip the data is stored in cells protected by floating gates. There two types of flash memory and these are NOR memory and NAND memory.

The NOR memory provides high-speed random access, reading and writing data in specific memory locations, it can retrieve as little as a single byte. The NOR memory have some disadvantages like low programming, erasing speed and when the NOR memory cell is big enough it make it expensive.

The NAND memory reads and writes sequentially at high speed, handling data in small blocks called pages to reduce the read time. Cost of bit of NAND memory is cheaper than of the NOR memory.

The origins of Flash memory can be founded in the 60s at Bell Laboratories when two engineers invented the floating gate memory device. In the 80s at Toshiba's laboratories Fujiro Masuoka invented with his team the flash memory and a coworker of Masuoka after seeing how the erasing process works, reminded him the flash of the camera, so he suggested to call the new technology flash memory. Toshiba commercially launched the first NAND memory (1987) and Intel Corporation produced the first commercial NOR memory (1988). SunDisk obtains the System Flash patent (1989). The Flash memory industry has increased exponentially (1990) and his takings were \$170 million in 1991 and reached over \$1.8 billion in 1995. The flash memory was implemented in the first cell phones (1997). M-Systems and Trek Technology introduced USB flash drives (2000). Apple introduced two flash-based iPods. The process of computerization of flash memory started (2005).

Interesting things about the Flash memory





Most expensive flash memory

The most expensive flash drive in the world was created by a Swiss jewellery company "La Maison Shawish". Its peculiarity is that this memory is covered with rubies, emeralds, rubies, diamonds and sapphire with a gold yellow and pink colour.

Flash memory in a fridge? and why?

The temperature can be the most important thing for the storage of flash memory because if it is adequate, the device can withstand up to 10 years! For example, a USB flash stored in a refrigerator has a longer storage life. At 100 C, the USB flash will be completely damaged in 10 hours.

Pc lock

PC lock: We know that protecting a USB flash is one thing. Well, with USB flash drives you can use it as a computer key and while this key is connected, you can access the computer. But if you unplug it, the computer won't let you work anymore...

The invincible memory

USB flashes are very durable and can withstand extreme pressures and extreme temperature conditions. They can withstand large drops, shocks and are unlikely to suffer physical damage or wear and tear.

CD-ROM



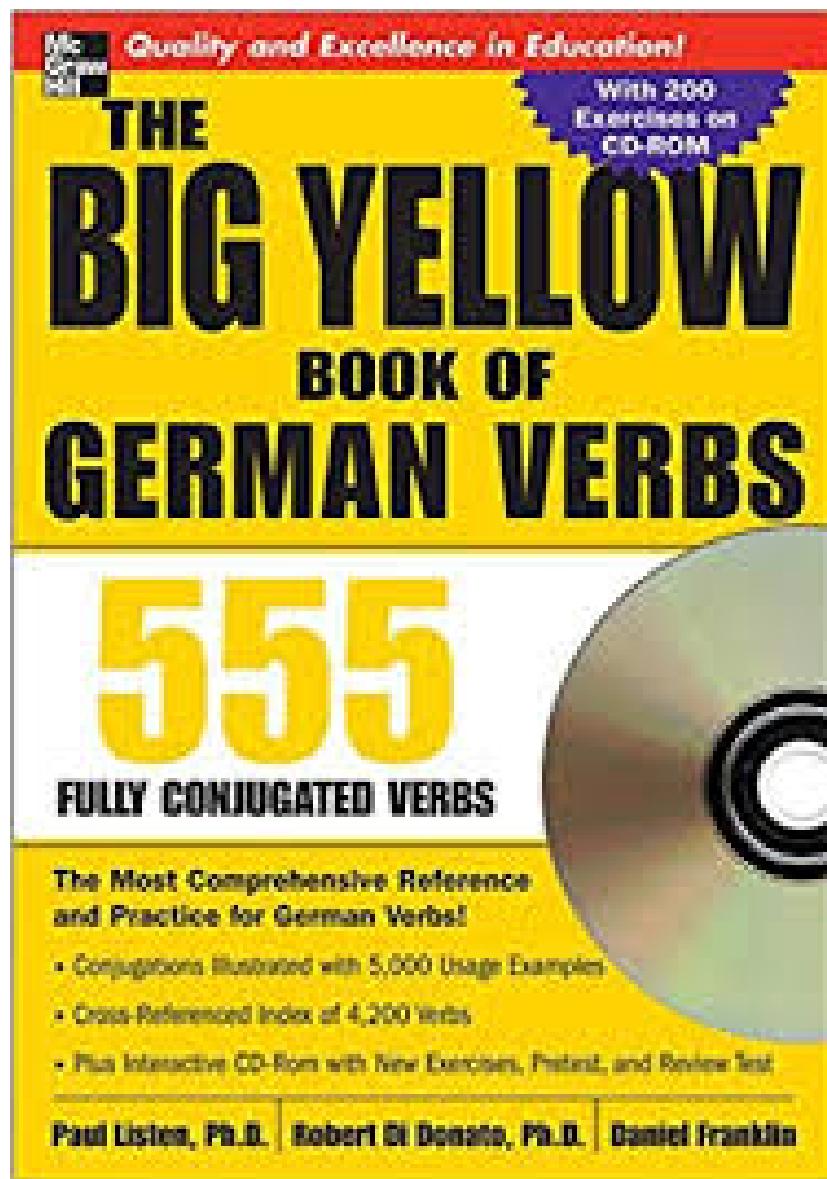
Philips



” We decided for a thin, shiny and circular storage disc, which could hold about 80 minutes of music”.

Philips1980s







A CD-ROM (complete name, compact disc read-only memory) is a type of compact disc that contains data. CD-ROM is one of the extensions of CD. This type can only be read but not recorded or erased. The successors of the floppy disks, CD-ROMs with their memory capacity and speed of access to information were the first devices to meet the growing demands.

A CD-ROM is an extension of Compact disc and it is able to holds 650MB or 700MB of data; these technical specifications are collected in the Yellow book. The yellow book is an extension of Red book; Both are inside of Rainbow book, that contains all technical specifications.

There are two CD-Rom formats that are: CD-Rs are read-only CD-rom, in which you cannot modify the existing data on the disc. A peculiarity and that they are characterized by a silver colour when they are created by the distribution companies. On CD-RWs data can be written, rewritten or deleted several times. Data can also be recorded several times (multi-session). Once written, the data can be edited in subsequent recording sessions. The peculiarity of CD-RWs is their dark blue colour.

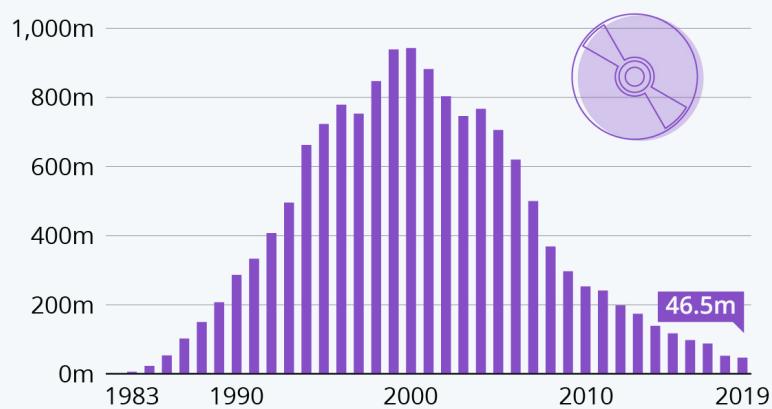
Sony and Philips show the first Compact Disc for an audience of specialists only (1979). The first commercial compact disc to be produced was a Waltz recording (1982). The first lunch of CD technology took place in Japan and then in Europe and North America (1983). The CD-ROM is introduced (1985). Over 400 millions CD copies were sold (1988). Philips and Sony introduce recordable CDs to the public (1990). The CD-ROM has given way to USB sticks and fully online file storage and sending systems (2000). Over 2 billions CD copies were sold (2007). Competition of digital music and format CD (2014).

Interesting things about the CD-ROM



The Rise and Fall of the Compact Disc

CD album sales in the United States since 1983
(in million units)



Source: RIAA



statista



The first CD lector

The first CD player was the CDP-101 and cost was \$1,500. The player was released in Japan at the end of 1982 along with 50 CDs, including Joel's 52nd Street, Toto's Turn Back, Pink Floyd's Wish You Were Here, Michael Jackson's Off the Wall, etc..

Decline of CD

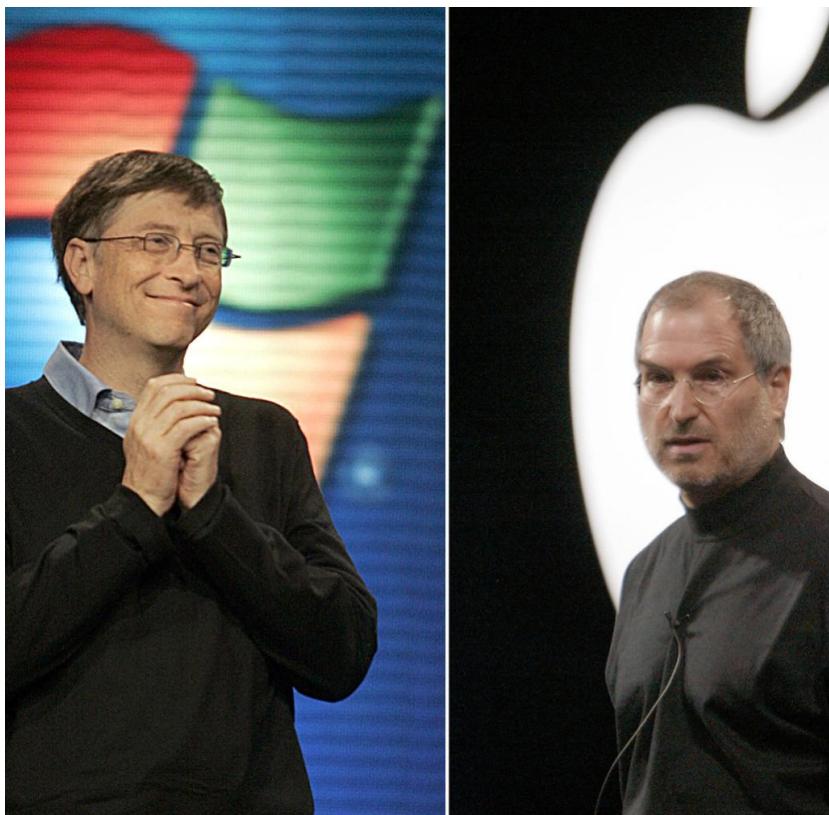
Over the years and the arrival of the 2000s were devastating for the CD-Rom which was replaced by the Usb drive. In general, CDs had an exponential drop in sales all over the world.

Multimedia

The CD-ROM was the first device able to meet the three features that allow multimedia: large storage capacity, fast access to multimedia information, easy manipulation of multimedia information.

Operating Systems

Important Characters



"I think the things you regret most in life are the things you didnt do."
Steve Jobs





When personal computers (PC) were first introduced, in the mid-1970s, the operating system was known as CP/M (Control Program/Monitor). CP/M had a text-based interface.

In 1981, MS-DOS (Microsoft - Disk Operating System) became the standard operating system for personal computers. MS-DOS was continually updated over the next several years. In 1985, Microsoft introduced the first operating system (Windows 1.0) with a graphic-user-interface for the personal computer giving users the ability to have graphic-based menus and icons to click on. It was a huge step for Microsoft. It was the company's first graphically rich user interface at this point, only Apple had released anything like it so it was pretty forward-thinking for the time.

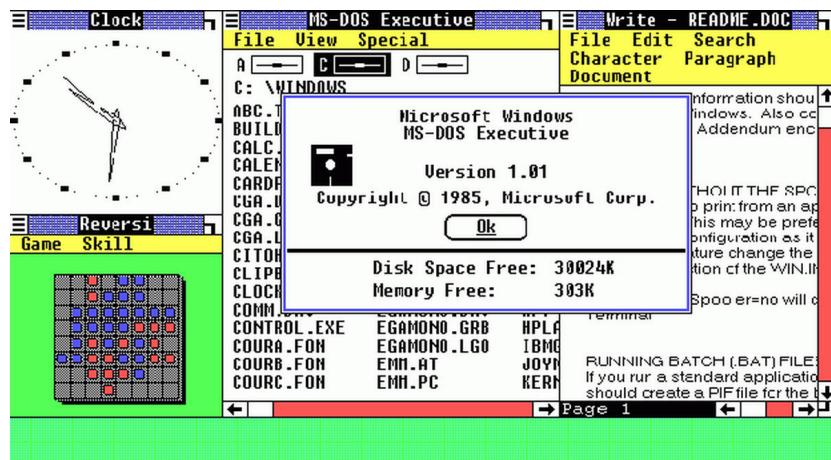
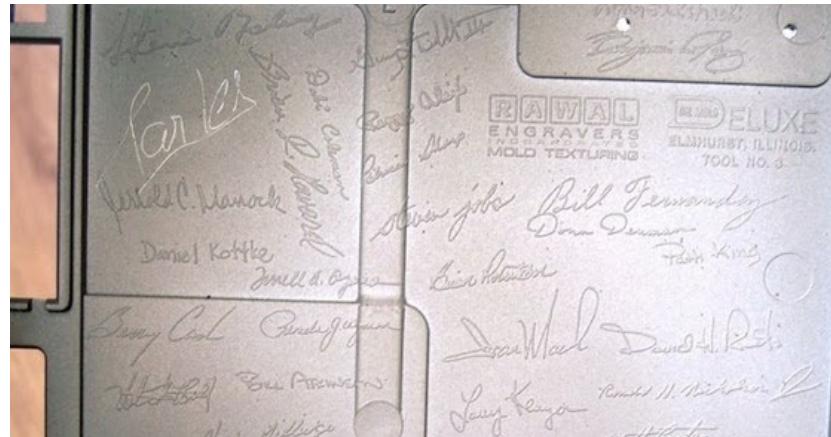
One year earlier in 1984, Apple Computer Inc. introduced the Macintosh personal computer, with the Macintosh 128K model, which came bundled with what was later renamed to Mac OS. After hearing about the pioneering GUI technology being developed at Xerox PARC from former Xerox employees, Jobs negotiated a visit to see the Xerox Alto computer and Smalltalk development tools in exchange for Apple stock options. The Macintosh operating systems used concepts from the Xerox Alto, but many elements of the graphical user interface were created by Apple including the menu bar, pop-up menus, and the concepts of drag and drop and direct manipulation.

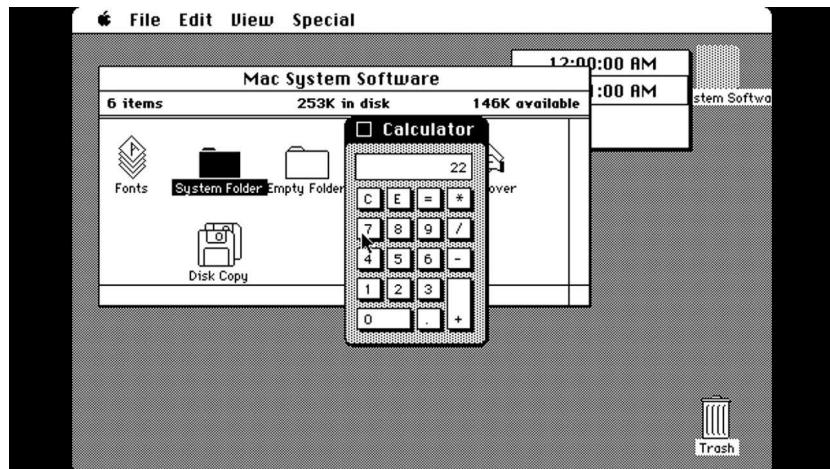
Although Windows 1.0 was smiled at by many as it was only released two years after the announcement, features included drop-down menus, scroll bars, icons and dialogue boxes, and instead of typing in complex commands, you navigated by pointing and clicking. In essence, it's the same basic user interface that we still use today. Now 45 years later Windows is the most popular operating system for personal computers globally. You cannot imagine a world without it. The Windows 1.0 was the starting point for a breathtaking evolution. Two years later Microsoft released Windows 2.0 and in 1990 Windows 3.0. The last version of Windows, Windows 10, was released in 2015.

After 46 years MacOS has already reached version 10.15. The operating system of today looks very different, but still has basically the same features as the former version 1.0. Many

elements of the graphical user interface: the menu bar, pop-up menus, and the concepts of drag and drop and direct manipulation are still a part of todays MacOS. Apples System 1.0 has significantly influenced today's macOS.

Interesting things





PRICE

Nowadays most operating systems come free or cost very little to upgrade. But back in the 80s it was a different story. The Apple Lisa cost around \$10,000, for example, and even the first Macintosh cost \$2,495 in 1984. By comparison, Windows 1.0 was dirt cheap - the software cost just \$99, in fact, while the PC required to run it could cost as little as \$600.

Hidden secrets

If you are lucky enough to own an early 128K Mac, you can find the signatures of the original design team moulded into the inside of its case.

Windows was almost named differently

It could have been called Interface Manager instead of Windows. That was the codename, but the catchier Windows won out in the end.

Easter Egg

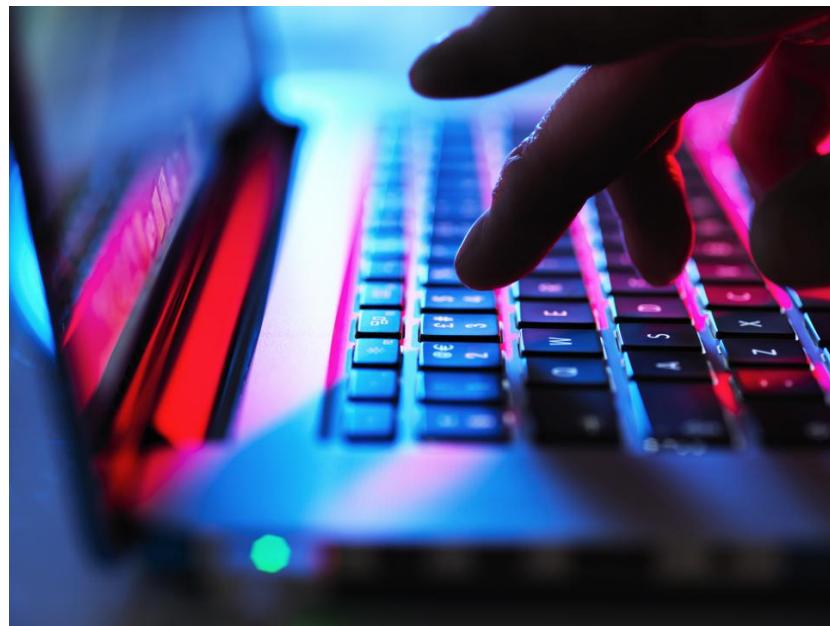
In Apples System 1.0 were implemented some Easter Eggs, one of them is hidden in the calculator. At the very bottom right corner is a black pixel that you can click and hold on to move the calculator around, just as if you were moving it by clicking on the Menu Bar. This is very handy if you don't want to close the calculator but want to move part of it off screen above the Menu Bar.

2 1991-2000

Programming languages during the 1990-2000 decade



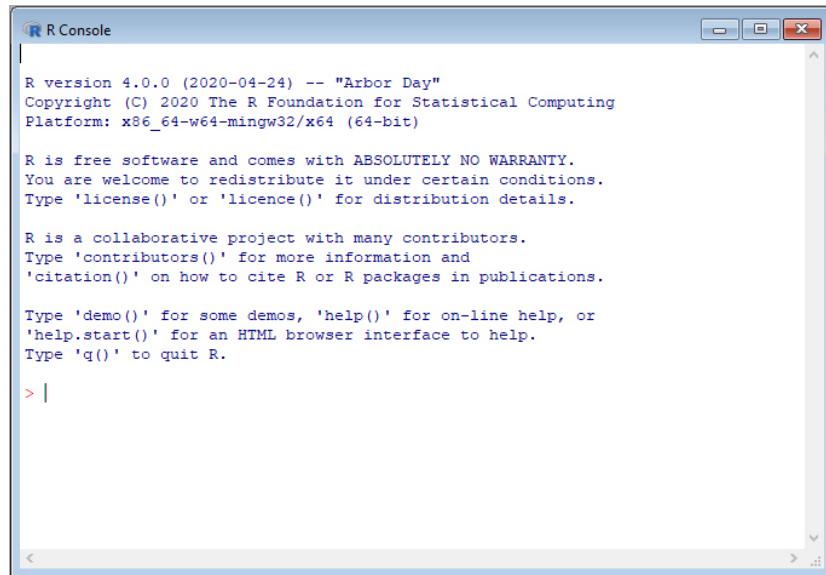
Coding



Any fool can write code that a computer can understand. Good programmers write code that humans can understand.

Martin Fowler

```
dens <- density(data, n = npts)
  dx <- dens$x
  dy <- dens$y
  if(add == TRUE)
    plot(0., 0, main
         ylab = "Density")
  if(orientation == "vertical")
    dx2 <- (dx - min(dx)) / max(dx)
    x[1.]
    dy2 <- (dx - min(dy)) / max(dy)
    y[1.]
    seqbelow <- rep(y[1.], length(dx))
    if(Fill == T)
      confshade(dx2, seqbelow, dy2)
```



```
File Edit View Search Run Options abacus12.bas Help
1 CHDIR ".\programs\samples\thebob\abacus"
2 '
3 '
4 '
5 ----- A B A C U S 1 2 . B A S -----
6 Copyright (C) 2007 by Bob Seguin (Freeware)
7 '
8 '
9 '
10 DEFINT A-Z
11 '
12 DECLARE FUNCTION InitMOUSE()
13 '
14 DECLARE SUB MouseSTATUS (LB, RB, MouseX, MouseY)
15 DECLARE SUB ShowMOUSE()
16 DECLARE SUB HideMOUSE()
17 DECLARE SUB ClearMOUSE()

Status [Find] Compiler error (check for syntax errors) (Reference:10428) on line 149 (click here or Ctrl+Shift+G to jump there)
1:1(67)
```



R is a programming language and free software environment for statistical computing and graphics supported by the R Foundation for Statistical Computing. Features: Paradigms Multi-paradigm: Array, object-oriented, imperative, functional, procedural, reflective
Designed by Ross Ihaka and Robert Gentleman Developer R Core Team First appeared August 1993; 27 years ago Stable release 4.0. / 10 October 2020 Typing discipline Dynamic

Filename extensions .r .rdata .rds .rda

R is an implementation of the S programming language combined with lexical scoping semantics, inspired by Scheme. Much of the code written for S-PLUS runs unaltered in R. In 1991 Ross Ihaka and Robert Gentleman at the University of Auckland, New Zealand, began an alternative implementation of the basic S language, completely independent of S-PLUS. They publicized this project starting in 1993. In 1995 Martin Maechler convinced Ihaka and Gentleman to make R free and open-source software under the GNU General Public License. The R Development Core Team was created to manage the further development of R. R is named partly after the first names of the first two R authors and partly as a play on the name of S.

The first official release came in 1995. The Comprehensive R Archive Network (CRAN) was officially announced 23 April 1997 with 3 mirrors and 12 contributed packages. The first official "stable beta" version (v1.0) was released 29 February 2000.

Visual Basic is a third-generation event-driven programming language from Microsoft known for its Component Object Model (COM) programming model first released in 1991 and declared legacy during 2008. Features: Paradigm Object-based and Event-driven Developer Microsoft First appeared 1991; 29 years ago Stable release 6.0 / 1998; 22 years ago OS Microsoft Windows and MS-DOS
Filename extensions .r .rdata .rds .rda

Alan Cooper created the drag-and-drop design for the user interface of Visual Basic. Visual Basic 1.0 was introduced in 1991. The drag and drop design for creating the user interface is derived from a prototype form generator developed by Alan Cooper and his company called Tripod. Microsoft contracted with Cooper and his associates to develop Tripod into a programmable form system for Windows 3.0, under the code name Ruby. Tripod did not include a programming language at all. Microsoft decided to combine Ruby with the Basic language to create Visual Basic. The Ruby interface generator provided the "visual" part of Visual Basic, and this was combined with the "EB" Embedded BASIC engine designed for Microsoft's abandoned "Omega" database system. Ruby also provided the ability to load dynamic link libraries containing additional controls (then called "gizmos"), which later became the VBX interface.

JAVA, PYTHON and JAVASCRIPT

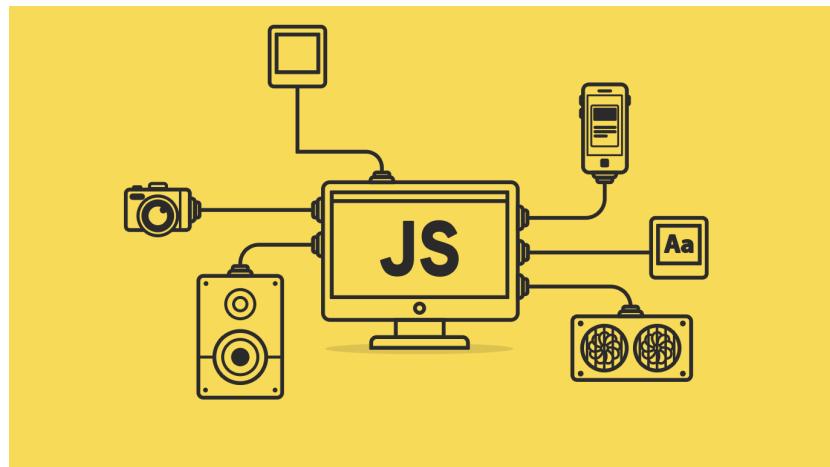


```
J JavaExample.java ✘
1 package com.beginnersbook;
2 public class JavaExample{
3     public static void main(String args[]){
4         String mystring = new String("Lets Learn Java");
5         /* The index starts with 0, similar to what we see in the arrays
6          * The character at index 0 is s and index 1 is u, since the beginIndex
7          * is inclusive, the substring is starting with char 'u'
8          */
9         System.out.println("substring(1):"+mystring.substring(1));
10
11        /* When we pass both beginIndex and endIndex, the length of returned
12         * substring is always endIndex - beginIndex which is 3-1 =2 in this example
13         * Point to note is that unlike beginIndex, the endIndex is exclusive, that is
14         * why char at index 1 is present in substring while the character at index 3
15         * is not present.
16         */
17        System.out.println("substring(1,3):"+mystring.substring(1,3));
18    }
19 }
```

Problems @ Javadoc Declaration Console ✘ Progress Coverage

<terminated> JavaExample [Java Application] /Library/Java/JavaVirtualMachines/jdk-9.0.4.jdk/Contents/Home/bin/java JavaExample

```
substring(1):ets Learn Java
substring(1,3):et
```



Java

Java and JavaScript are not cousins! They are not related with each other :) . Java is a class-based, object-oriented programming language that is designed to have as few implementation dependencies as possible. It is a general-purpose programming language intended to let application developers write once, run anywhere (WORA), meaning that compiled Java code can run on all platforms that support Java without the need for recompilation.

History

James Gosling, Mike Sheridan, and Patrick Naughton initiated the Java language project in June 1991. Java was originally designed for interactive television, but it was too advanced for the digital cable television industry at the time. The language was initially called Oak after an oak tree that stood outside Gosling's office. Later the project went by the name Green and was finally renamed Java, from Java coffee, the coffee from Indonesia. Gosling designed Java with a C/C++-style syntax that system and application programmers would find familiar.

Python

Python is an interpreted, high-level and general-purpose programming language, created by Guido van Rossum and first released in 1991. Python was conceived in the late 1980s by Guido van Rossum at Centrum Wiskunde & Informatica as a successor to the ABC language, capable of exception handling and interfacing with the Amoeba operating system. Its implementation began in December 1989. Van Rossum was the lead developer until 12 July 2018, when he announced his "permanent vacation" from his responsibilities as Python's Benevolent Dictator For Life. Important Features: Paradigm Multi-paradigm: functional, imperative, object-oriented, structured, reflective Developer Python Software Foundation Typing discipline Duck, dynamic, gradual (since 3.5) OS Linux, macOS, Windows and more Filename extensions .py, .pyi, .pyc, .pyd, .pyo (prior to 3.5), .pyw, .pyz (since 3.5)

JavaScript

JavaScript (JS) is a programming language that conforms to the ECMAScript specification. JavaScript is high-level and multi-paradigm. JScript was first released in 1996, alongside initial support for CSS and extensions to HTML. The rise of JScript In November 1996, Netscape submitted JavaScript to ECMA International, as the starting point for a standard specification that all browser vendors could conform to. This led to the official release of the first ECMAScript language specification in June 1997. The standards process continued for a few years, with the release of ECMAScript 2 in June 1998 and ECMAScript 3 in December 1999. Work on ECMAScript 4 began in 2000. Important Features: Paradigm : event-driven, functional, imperative Designed by: Brendan Eich First appeared: December 4, 1995 Typing discipline: Dynamic, duck Filename extensions: .js .mjs

Y2K Bug



John Hamre

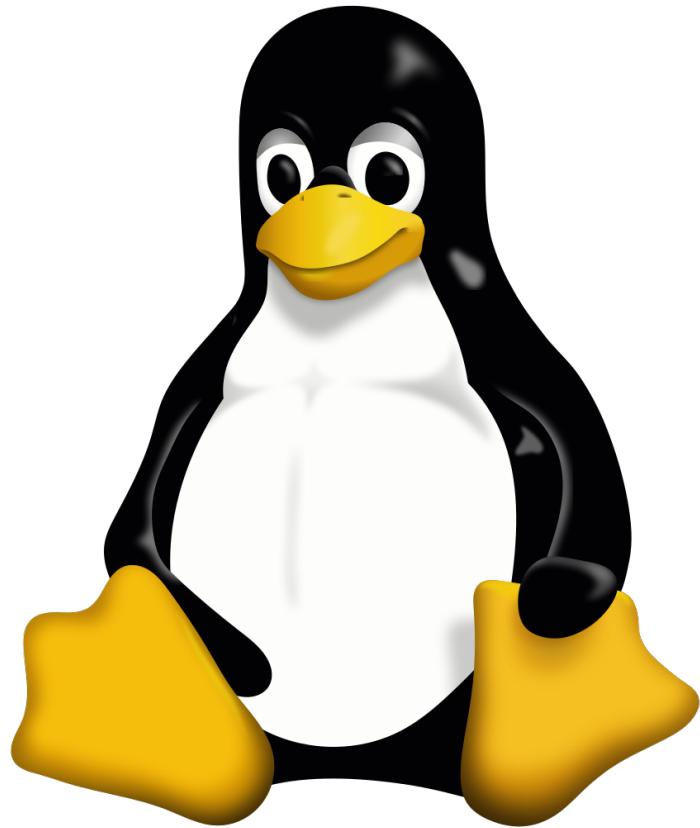


"The Y2K problem is the electronic equivalent of the El Nio and there will be nasty surprises around the globe.
John HamreUnited States Deputy Secretary of Defense

Linux



Linux



”Talk is cheap. Show me the code.”
Linus Torvalds2000

UNIX





UNIX is a modular, multitasking and multiuser operating system created in the 70s at AT&T Bell Labs. It had a lot of success because it is the first portable OS written in a high-level language (C) instead of assembler. The system was working on a lot of machines but was very expensive because of commercial licenses.

Many developers started to work on creating free and open-source alternatives. Richard Stallman started the GNU project in 1983 with this goal. Many volunteers around the world contributed to development and by 1992 the project had completed all of the major operating system utilities and ported to the system many other components (such as X Windows, TeX,), but had not completed their proposed operating system kernel, GNU Hurd. MINIX was a simplified version of UNIX used for teaching created by Andrew S. Tanenbaum in 1987 for teaching his operating systems course. This OS was designed on a 16-bit architecture and it did not work on the common Intel 386 architecture used on PCs. MINIX was also covered by a license permitting only educational use.

In 1991 Linus Torvalds, while he was a student at the University of Helsinki, wanted to start developing, just for fun, a new operating system based on UNIX: Linux. Torvalds was a MINIX user and asked for help on Usenet (a worldwide distributed discussion system, a sort of forum used before the web). On 25 August 1991 Linus posted a message to the "comp.os.minix.", a newsgroup where people discussed about the MINIX operative system:
Hello everybody out there using minix -

I'm doing a (free) operating system (just a hobby, won't be big and professional like gnu) for 386(486) AT clones. This has been brewing since april, and is starting to get ready. I'd like any feedback on things people like/dislike in minix, as my OS resembles it somewhat (same physical layout of the file-system (due to practical reasons) among other things).

I've currently ported bash(1.08) and gcc(1.40), and things seem to work. This implies that I'll get something practical within a few months, and I'd like to know what features most people would want. Any suggestions are welcome, but I won't promise I'll implement them :-)

Linus (torvalds@kruuna.helsinki.fi) PS. Yes - it's free of any minix code, and it has a multi-threaded fs. It is NOT portable (uses 386 task switching etc), and it probably never will support anything other than AT-harddisks, as that's all I have :-(. Linus Torvalds

This request had an enormous success and by February 1992 Linux kernel had become one of the biggest open source projects ever . In 1992 Orest Zborowski allowed Linux to support a graphical user interface with the X Windows System. From there on Linux started to gain importance. In 1993 the Linux kernel was adapted to the GNU environment replacing GNU Hurd. In 1994 Torvalds declared the system mature and releases the 1.0 version. From that point Linux started to be used also by commercial companies (Red Hat, Suse,).

Important Devices



Important Devices



”To infinity... and beyond!”
Buzz Lightyear1995













Beowulf Cluster Supercomputers are extremely powerful computers used for very complex tasks. They are necessary in all cases where you need to produce results in short time and with a lot of computation and data usage (for example: weather forecasting or physical simulation). The performance is typically measured in FLOPS (Floating Point Operation Per Second). ASCI Red was the first supercomputer reaching 1TeraFLOP, it was considered the most powerful computer in the world from June 1997 to June 2000. Now the fastest supercomputer is 100 times faster. This performance is achieved not just increasing the frequencies of the CPU but by doing many parallel operations. Supercomputers were a lot expensive to buy (since companies sold few of them, unlike PCs, and a great deal of research work was needed to build them) but at the same time, according to Moore's law, they aged very fast. So companies or universities had to maintain old expensive super-machines that were not as powerful as those of the time.

Beowulf cluster, built in 1994, changed high-performance computing by popularizing the concept of supercomputer made of commodity components. A cluster is a set of computer connected to each other with the goal to distribute a very complex work between several computers, increasing the calculation power. Parallel Virtual Machine has allowed everyone to build parallel machines of all types and program them in a standard way. Cluster

computers are difficult to program but not so expensive to update as the classic supercomputers.

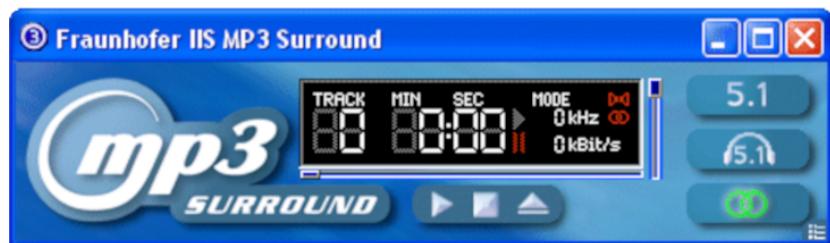
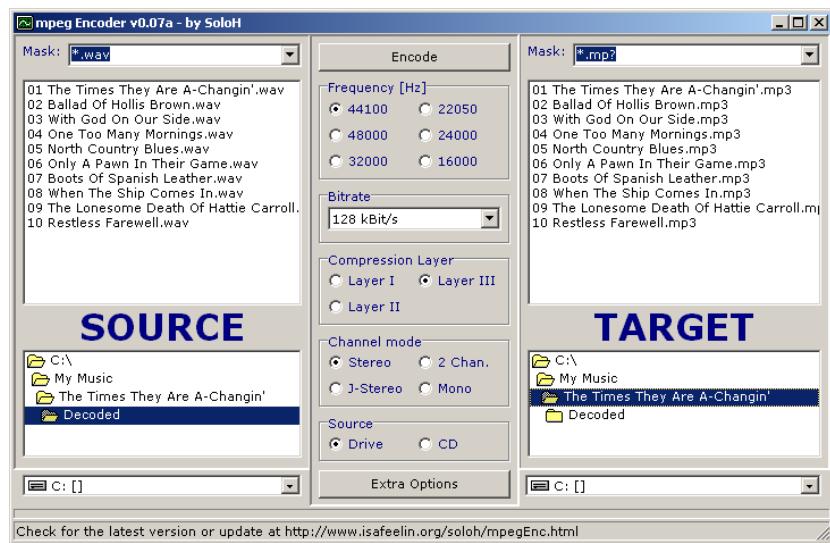
MP3 + MP3 Players Because of the relatively small hard drives of the era (5001000 MB) compression was essential to store multiple albums' worth of music on a home computer as full recordings. MP3 format, standardized in 1993 (ISO/IEC 11172-3), is the first standard making this possible, using a lossy compression format exploiting human perceptual limits. The birth of the MP3 standard changes the world of music. In 1994 the Fraunhofer Society released the first software MP3 encoder, called l3enc. The year later the second MP3 version was standardized and the WinPlay3 media player lets many people to encode and play back MP3 files on their PCs. In spring of 1998 was released the public in Asia the first MP3 player: Saehan's MPMAN, a device with the only purpose to play music. But the great spread of MP3 Players is due to the iPod, released by Apple in 2001.

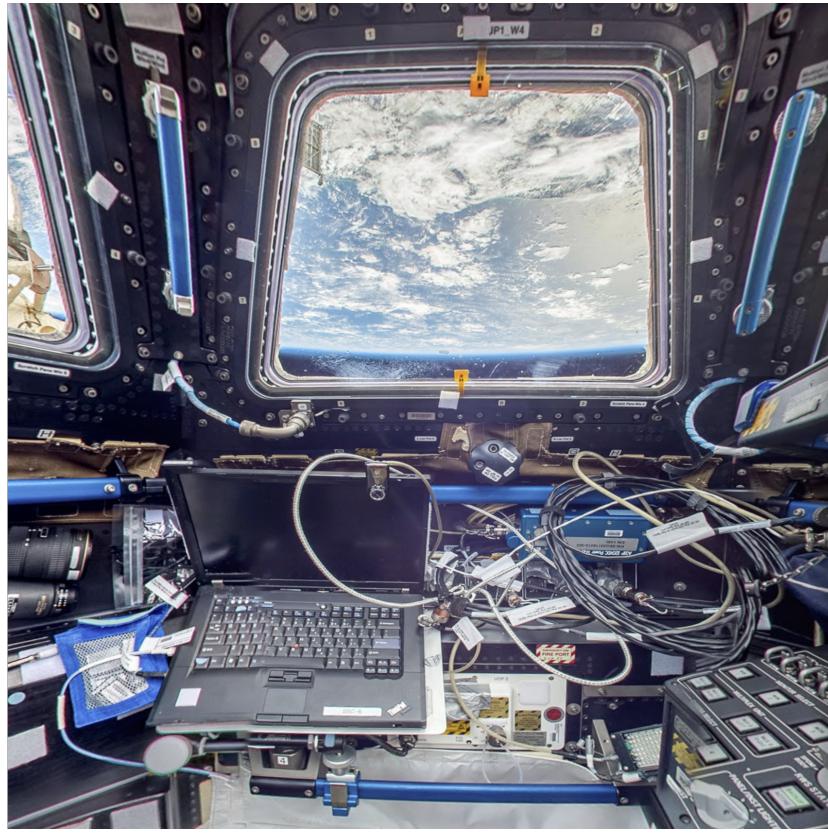
PDA PDAs were not meant to replace computers but only to be portable devices used to store contact information, manage calendars, communicate by e-mail, and handle documents and spreadsheets. They were also synced with PCs. Personal digital assistant could be considered a predecessor of nowadays smartphones. They usually had a small physical keyboard and some of them had an electronically sensitive pad to support handwriting. Apples Newton, released in 1993, was the first widely sold PDA that accepted handwriting. In 1996 Palm Inc. released the first Palm Pilot that became the model for other companies to follow.

ThinkPad ThinkPad series by IBM is a series of rugged laptop for professionals that changed the history of laptops with many features: Instead of the actual touchpad they used the TrackPoint: a little joystick used as a pointing device. The keyboard was light by a LED light placed at the top of the screen. A biometric fingerprint reader ThinkPads used an accelerometer to detect if the laptop is falling in order to shut down the hard disk to save files. Holes to reduce water infiltration damages ThinkPad 701, released in 1995 mounted the iconic Butterfly keyboard reduce the laptop dimension to the screen size when closed.

SONY PlayStation PlayStation is a video-game console made by Sony. The first PlayStation was released in Japan in 1994. It was later upgraded and redesigned in many ways: the PS one (smaller than the original), the Net Yaroze (a special PlayStation with which you could create new games and applications) and the PocketStation (an handheld version). PlayStation had a lot of success and quickly became the first console of any type to ship over 100 million units.

Interesting things about the important devices





Beowulf Cluster Name

The name comes from an old English poem. Beowulf was the main character and, in the poem, he is described as follows: he has thirty mens heft of grasp in the gripe of his hand, the bold-in-battle. So a distributed computing system could be seen as an army.

MP3 Hacked

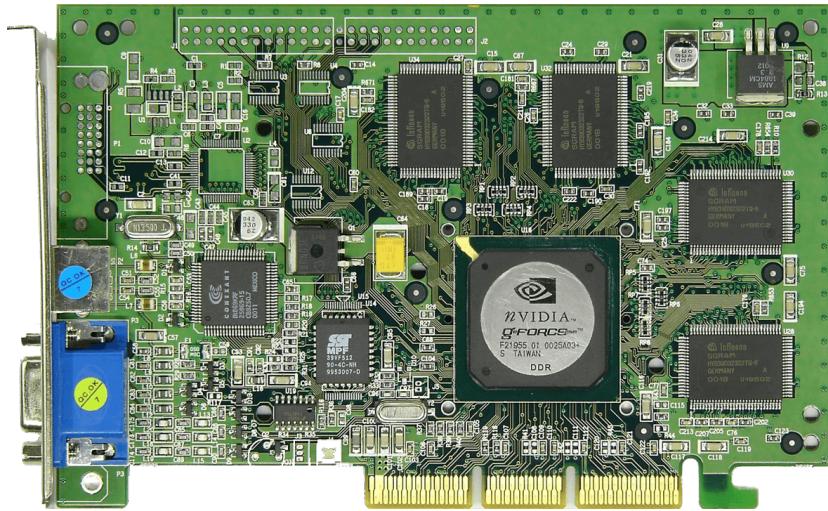
The great success of MP3 format is also due to a story of hacking. The original idea by the industry was to develop a commercial encoder for record companies and a free decoder for devices or PCs. To show the potential of the technology Fraunhofer, the owner of the patent of MP3, developed a small low quality demo at the beginning of the 90s. A Dutch hacker, known as SoloH, copied the source code from an unprotected machine, hacked it to improve the performance, he added a user interface and released the program mpegEnc for free on his website in 1993. Similarly an Australian hacker released a solution called l3enc. Later on a Swedish programmer improved the encoding speed. These programs were immediately copied all over the world and people started to encode CDs and share music.

ThinkPads in Space

ThinkPads were so robust that they were chosen by NASA for many space missions. In 1993 NASA checked if radiation in the space environment caused memory anomalies or other unexpected problems. After this test, they were used without modifications for many Space Shuttle missions. They were the only laptop certified for use on the ISS, but with some

changes to improve safety for long missions. Modifications include taking into account of the reduced of gravity by adding Velcro tape to attach to surfaces and changes in the cooling fans.

1999: NVIDIA launches "the world's first GPU", the GeForce series is born

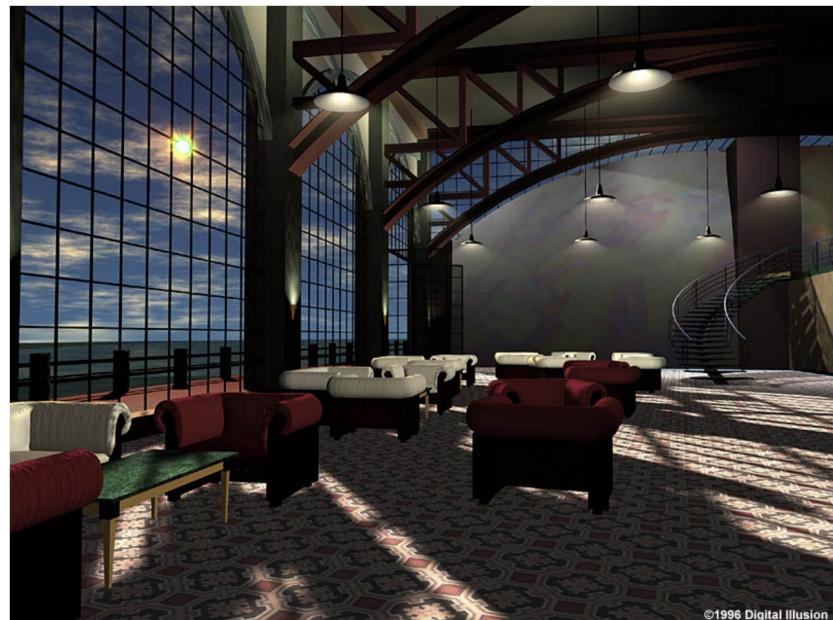
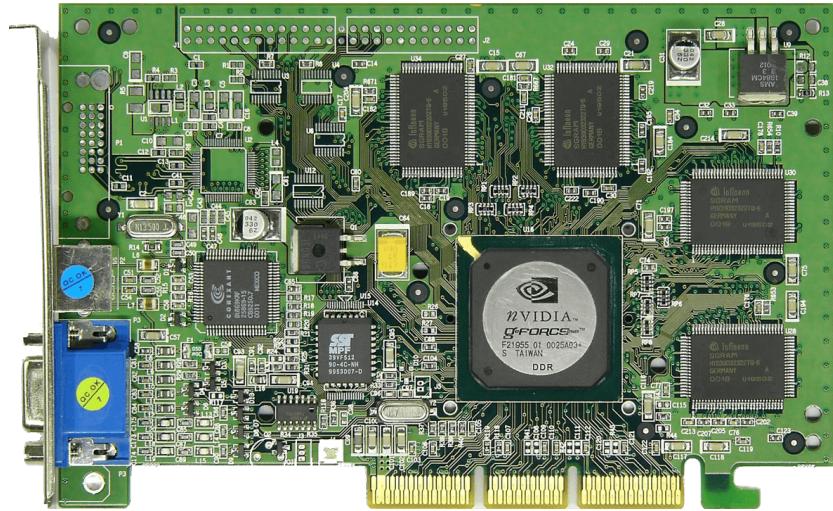


Jen-Hsun Huang



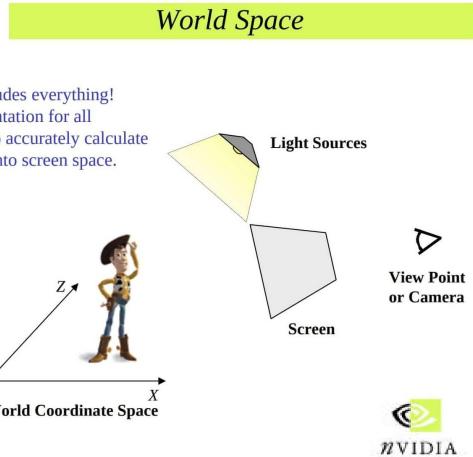
"The GeForce 256 continues NVIDIA's long tradition of introducing groundbreaking technologies and trend-setting products to the PC market. The GPU is a major breakthrough for the industry and will fundamentally transform the 3D medium. It will enable a new generation of amazing interactive content that is alive, imaginative, and captivating. The richness of this new 3D medium will have a profound impact on future of storytelling and will broaden the appeal of 3D far beyond the game enthusiasts."

Jen-Hsun Huang 1999



©1996 Digital Illusion

Figure 2
World Space



In fact the term GPU and 3D accelerator cards already existed long before the GeForce 256, but the one proposed by NVIDIA actually boasted features that represented such innovations that this card could really be defined as "the first in the world".

First and foremost, this GPU was the first to incorporate the normal functions of a video card and the 3D acceleration function into a single component, tasks that were previously entrusted to two separate cards.

The second was, the presence of the Transform and lighting Engine in a graphics card dedicated to the consumer market.

The question now is: what was this engine used for and why was it so important?

Lighting engine

The lighting function basically made it possible to adapt the colors of the represented scene according to the lighting information of the surfaces. As an example, thanks to the introduction of this technology, it became possible to render the shading of the elements of the scene, thus drastically increasing the perception of realistic images.

Transform engine

The concept behind the Transform engine, on the other hand, is more complicated and technical and here is an in-depth explanation from an official NVIDIA Technical Brief on the subject of Transform and lighting:

"The process of describing and displaying 3D graphics objects and environments is complex. To reduce this complexity, it is useful to describe the 3D data according to different frames of reference, or different coordinate systems, at different times. These different frames of reference are referred to as spaces such as world space, eye space and screen space. Each of these spaces is convenient for one or more operations that must be performed as a 3D image is created. World space is used for holding all of the 3D objects that are part of the 3D world. Eye space is used for lighting and culling and screen space is used for storing the

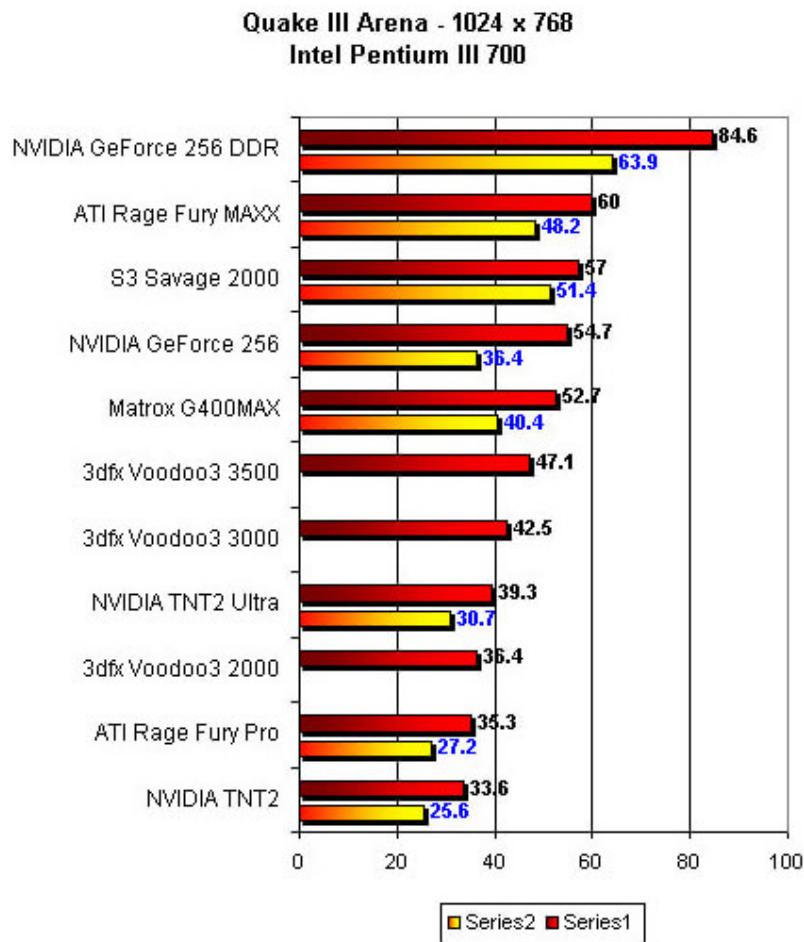
scene in the graphics frame buffer. However, because these spaces use different coordinate systems, 3D data must be converted or transformed from one space to another as it moves through the 3D pipeline. The transform engine performs all of these mathematical transformations.”

Wanting to summarize it all in a much simpler way the purpose of this component is to generate a two-dimensional view starting from data of a three-dimensional scene in order to facilitate the processing of data necessary for the generation of the final 3D image. The reason why the introduction of the transform and lighting (T&L) engine hardware has been so important is the performance increase it has made possible on computers. Previously T&L operations were entrusted to CPUs but this was not very suitable for this kind of graphic operations.

The introduction of this technology by NVIDIA has thus allowed to drastically increase the efficiency of computers leaving the GPU the task of processing graphics operations and at the same time the CPU time to perform all other types of calculations.

Interesting things about the GeForce 256





21 years later the GeForce 256 is reborn as LEGO

This year an artist from the London area has decided to propose on LEGO ideas, the official LEGO platform for the proposal of new production ideas by the community, a project in honor of the first GPU in the world, just the 256 we have talked about so far. The idea was very much appreciated by fans of old school technology and in June 2020 it already had more than 2300 positive comments (on the minimum necessary of 10k to be considered as a possible idea for production and official sale on a large scale). Currently consulting the official page the proposal would seem to have expired (apparently before the theoretical time available). Despite this, the same artist has also proposed two other projects dedicated to two other iconic products of the world of technology. 3DFX Voodoo and Creative Labs - Sound Blaster Pro 2 that are still in the race to reach the 10,000 positive evaluations needed. If you're interested you can have a look at this artist's official Twitter account: @Bhaal_Spawn, or also her LEGO ideas page: @Bhaal_Spawn.

The 2 variants

The GeForce 256 was produced by NVIDIA in two distinct variants: SDR and DDR. These terms refer to the type of memory used. The first version is the original one, launched in October 1999 at a cost of about \$250, and supported SDR (Single Data Rate) memory up to a maximum of 32MB. The second version was launched a few months later, in February 2000, and boasted a new generation of memory, DDR (Double Data Rate). To understand well the difference between these two types of memory and the improvement occurred between the two generations we can read this explanation of the two technologies:

” SDR makes a single data transfer for each full cycle of the clock. So, a clock rate of 100MHz translates to 100 million data transfers per second (100MT/s) with SDR. DDR makes a data transfer on both the rising edge and the falling edge of the clock. That's two data transfers in a single clock cycle. A clock rate of 100MHz then translates to 200 million data transfers per second (200MT/s) with DDR. ” - Definition by Joe Zbiciak (20 years as processor architect)

This change of technology has allowed an impressive increase in GPU power between the two versions in terms of bandwidth (i.e. the amount of data that can be transferred over a given period of time²) from 1,144GB/s of the SDR version to 4.8GB/s of the DDR version. This new, more powerful version of the NVIDIA GPU was launched on the market, as was imaginable with a price of about \$300, which at the time was considered quite high enough for a graphics card, but on the other hand it is known that you pay for quality, and this GPU was certainly not lacking in quality.

The undisputed domain of the GeForce 256

The higher price of the GeForce 256 compared to the competition was not a bad choice for NVIDIA. In fact, the quality and performance of this product in its DDR version was so high that it clearly outperformed any other product at the time available on the video card market, so customers were happy to pay the increased price because they felt that that money was well spent.

In the picture opposite we can see the actual Benchmark score of the two versions of the GeForce 256 compared with those of the main competitors of the time such as the ATI Rage Fury MAXX or the S3 Savage 2000. The test as we see in the title was made in combination with an Intel Pentium III 700 CPU and with the first person shooter game Quake III Arena in 1024 x 768 resolution. From the graph we can see exactly what was said in the previous lines. We find the GeForce 256 SDR at a good level, in fourth place, with a performance score comparable to the average of the competition but still lower than some products like the two mentioned above.

In first place instead the DDR version of the 256 that, as mentioned above, shows its clear superiority by widely detaching the rest of the graphics cards and boasting a score even 41% higher than the second in the ranking.

Performance comparison between the GeForce 256 and the latest arrival: the RTX 3090
It is always said that technological evolution proceeds by tracing an exponential graph;
never was this statement more true. To realize the truthfulness of this statement we can think of the famous ”Moore’s law”, enunciated in 1965 by Gordon Moore, one of the founders of Intel, according to which the power of electronic circuits would roughly double every 18 months, generating an exponential graph.¹ This phenomenon is observable in all

areas of technology and that of graphic cards that we are dealing with is certainly no less. To realize this almost frightening evolution we can compare the technical specifications of the mother of the GeForce series and the latest addition to the family, the RTX 3090.

Release date: GeForce 256: December 23, 1999 RTX 3090: September 1, 2020

Transistors number: GeForce 256: 17 million RTX 3090: 28'300 million (+ 166'470% compared to 256)

Memory Size: GeForce 256: 32 MB RTX 3090: 24 GB (+ 75'000%)

Clock speed (processor speed, number of cycles executed every second): GeForce 256: 120 MHz / No overclock RTX 3090: 1395 MHz / 1695 MHz - overclock (+ 1'162.5% standard, + 1'412.5% standard)

Memory clock (memory speed) : GeForce 256: 150 MHz RTX 3090: 1219 MHz (+ 812.5%)

Process Size: GeForce 256: 220 nm (nanometers = 1 billionth of a meter) RTX 3090: 8 nm (approx. 96.35% reduction in size) With this number we indicate the size of the transistors, basically the more the number is low, the better, because with small size transistors it is possible to reduce the physical space needed for the same number or increase the number for the same space, thus making possible a considerable increase in power reconciled with the size.

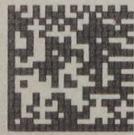
Looking at the data, it is clear that the increase in computing power is impressive. In just under 20 years the number of transistors (the electronic components that underpin and make possible the execution of calculations and logical operations by computers) has increased from 17 million to 28'300 million, achieving an impressive + 166'470% compared to the GeForce 256 that has literally made the potential computing power of this GPU 166'470% higher than the original. That of the number of transistors is the specification that has found the most important increase among all but if we look at the others were not less: the amount of memory available has achieved a + 75'000%, making it possible to store a much greater amount of data instantly accessible directly within the same hardware component, thus impacting positively on performance. Finally, the remaining specifications such as processor frequency, memory speed and transistor size have also improved impressively.

3 2001-2010

The first desktop-dedicated dual-core processor Athlon 64x2

AMD Athlon™ 64 X2

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NAAFG 0838EPMW
9660249I80235



AMD 
® © 2005 AMD

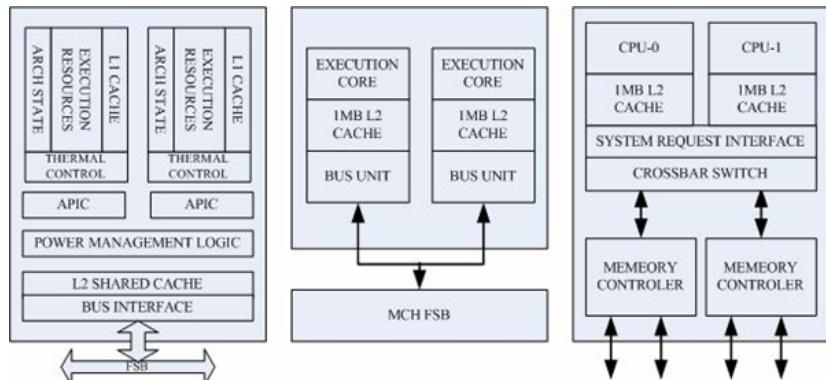
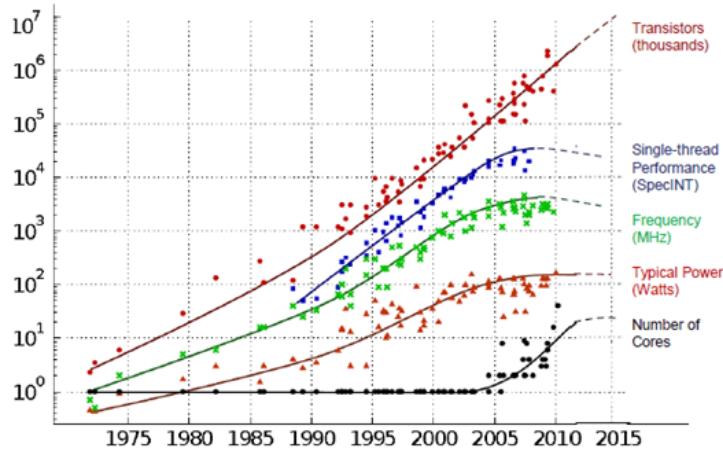
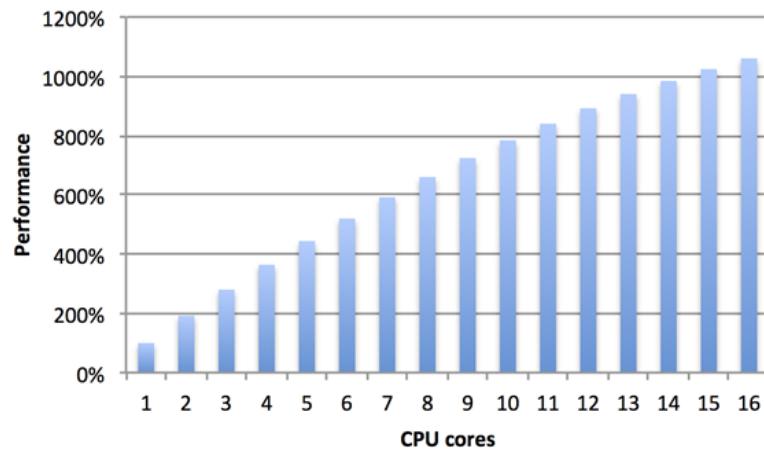
DIFFUSED IN GERMANY
MADE IN MALAYSIA

Dirk Meyer



AMD is delivering a simplified approach to more efficient processing power, with products that will deliver multi-core 64-bit computing to our strong customer base.”

Dirk Meyer2000s



The Athlon 64x2 represents a leap in the CPUs architecture, since it was the first desktop-dedicated multi-core processor. A double core allowed the signal not to work off-chip, which means an higher clock rate. This meant higher-quality signals, which allowed

more data to be sent in a given period of time. Furthermore, multi-core CPUs require less resources for higher performance, three example are: -less space on the printed circuit board (since the cores share some circuitry), which leads to a lower risk of design errors. -less power, because of the decreased request to drive signals outside of the chip -lower energy, since every core in a multi-core CPU is more energy-efficient All these improvements in the CPU architecture contributed to the spreading of the Athlon 64x2.

It opened a new way into the improvement of CPUs, since until its release the two known ways to improve a CPU were: -increase the number of transistors on the same surface or reduce the surface of the integrated circuit, decreasing in this way the cost per device on the integrated circuit -increase the clock speed, increasing in this way the speed of the CPU

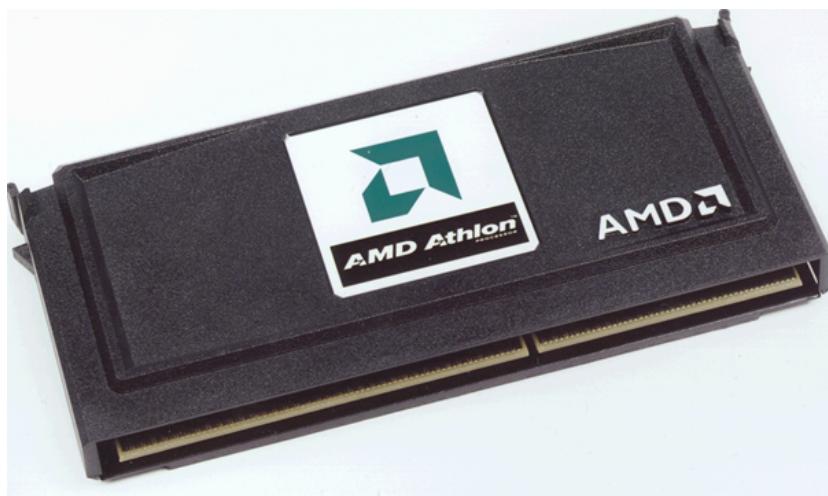
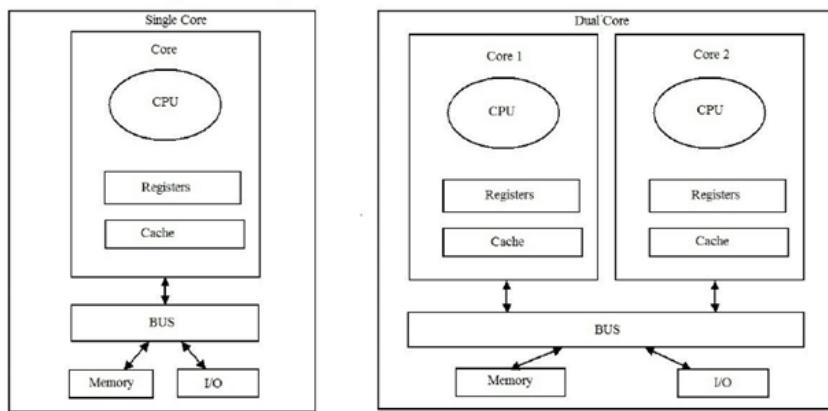
While the clock speeding improvement was slowing, the multi-core processor was born, amplifying the CPUs improvement opportunities. This means that the Athlon 64x2 was a great revolution for the CPUs market, and it was also an incentive to keep improving the CPU performance by adding more cores, in fact nowadays we have CPUs that can contain 4 or more cores.

It allowed AMD to sold more chips than Intel for the first time, thanks to that chip AMD took an advantage in the "AMD-Intel war": during that period numerous multi-core processors were already born (the first was the IBM POWER4), but they were all applied for Workstations and servers. AMD and Intel had their server version of a multi-core processor, for example the AMD Opteron. Both the companies were running to be the first company releasing a desktop multi-core CPU. Unfortunately for Intel, the Athlon 64x2 were released first (May 2005), and this influenced negatively Intels work, since the company decided to accelerate in order to release as first as possible their processor. But the sudden speed up in the work brought Intel to build a processor that was worse than the Athlon 64x2 in almost every aspect: the Pentium D was born. Intel Pentium D vs AMD Athlon 64x2 Athlon 64x2 -The Athlon architecture provides that the communications between the two cores take place using the SRI (System Request Interface), which is in charge of sending a particular processing request to the available core at a precise moment. This whole process takes place inside the processor die, avoiding the access to the external bus (the HyperTransport).

-The Athlon 64x2 maintained the same clock rate as its single-core counterpart, in this way no one noticed a drop in performance while using non-optimized applications.
Intel Pentium D - In the Pentium D architecture the communications between the two cores take place in the HyperTransport (an external bus, which isn't in the processor die), which slows extremely the performance. In general we can say that the performance of the HyperTransport is worse than the performance of the SRI.

-The Pentium D requested the user to buy a new motherboard based on the chipset i955X o i945P, while to use the Athlon the user only had to make a BIOS update.
-The positive side of the Pentium D was the price, which was (for obvious reasons) less than the Athlons.

Interesting things about AMD and the Athlon family



XBOX ONE	PS4
AMD 8-Core "Jaguar" CPU (x86-x64)	AMD 8-Core "Jaguar" CPU (x86-x64)
AMD Radeon Based GPU 12 Compute Units 768 Shader Cores	AMD Radeon Based GPU 18 Compute Units 1152 Shader Cores
Peak Power: 1.23 TFLOPS	Peak Power: 1.84 TFLOPS
8GB DDR3 RAM Memory Bandwidth: 68.3 GB/s	8GB GDDR5 RAM Memory Bandwidth: 176.0 GB/s
500GB HDD Non-removable	500GB HDD <i>Removable and replacable</i>

Single-core vs dual-core The behavior of a dual-core processor is equal to the behavior of two single-core CPUs running on the same chip. Technically the performance of a dual-core CPU is the same as two single-core computers fused together.

AMD & Intel AMD started producing second-source chips for the Intel corporation, until their contract ended in 1986.

Athlon family The first Athlon processor was also the first 1GHz processors ever created, which marked AMD as a serious competitor in the CPUs market.

Gaming Monopoly In 2014 AMD had the monopoly of the gaming console market, to be more precise all of the, at that time, major gaming consoles used an AMD processor as core of the console.

Just Google It!



Google



"If we were motivated by money, we would have sold the company a long time ago and ended up on a beach."
Larry Page





As we have already said, Google officially went public in 1998. 1999 was a very important year for Page and Brin, in fact the company moved to Palo Alto, California in the region we call Silicon Valley. In September 1999 there was another crucial event, in fact google came out of the beta phase and thus began its rise. The advent of the new millennium brought with it an air of novelty and a desire for expansion. In 2000 Google became accessible to a myriad of more people, 10 new languages were added: French, German, Italian, Swedish, Finnish, Spanish, Portuguese, Dutch, Norwegian, Japanese, Chinese, Korean and Danish.

At the same time, Google invested time and money in developing an advertising system within the search engine. Thus was born Google Adwords (now Google Ads). AdWords was a web revolution. Google wasn't the first to implement something like this, but it certainly was the first to believe it. AdWords is structured in this way: up to four ads are displayed above the unpaid search results, or below the search results and are selected by an algorithm

that, among many variables, takes into account the keywords searched by the user. By doing so, advertisements relevant to the user's purposes will be shown, thus also improving the investment by the companies that publish through this service. Subsequently in 2003

Google decided to expand the world of web advertising, thus enabling anyone to sell

advertising space on its site. This gave birth to Google AdSense, a banner advertising service offered by Google. With AdSense you can place advertisements on your website, earning based on the number of ad exposures (impressions) or clicks on the ads. The advertising contents belong to third parties with respect to the owner of the website (publisher) who hosts them on their pages. This type of advertising will become the core of the company's earnings with Google AdsWords.

After 5 years from its foundation, Google became a publicly traded company on August 19, 2004. Also on this occasion Google managed to stand out and do something new. Thanks to the agreement with Credit Suisse and Morgan Stanley, an online auction system was developed in which the shares were then sold. After this important event the company grew exponentially and began to become the giant we know today. In the same year google decided to join the field of mail services. Gmail, which soon became one of the dominant platforms of its kind, was announced on April 1, 2004, and no one wanted to believe it thinking it was an April Fool Prank. The free service came out of public beta a full 5 years later in July 2009. Upon release, the platform included an integrated search bar that allowed you to search for emails or contacts, a new and intuitive interface and the ability to save up to a gigabyte of space. These innovations were considered revolutionary at the time and are now obviously the standard. However, Google has not forgotten its search engine and in fact has continued to improve it by adding features such as autocomplete suggestions. An incredible improvement that increased the speed with which users could do a search. In fact, this type of function, then introduced almost everywhere, suggests searches based on the user's history and the most searches carried out by other users, quickly showing all of the user's possibilities.

Since 2005 the company's approach has changed trying to develop new interesting applications and acquiring small companies with potential. In fact, in this year Google acquired Android Inc and hired its creators Andy Rubin, Chris White and Rich Miner. Then the same year google started the development of Google Maps. On February 8, 2005, the map service was announced on the Google Blog, available for Internet Explorer and Mozilla Firefox browsers.

Google Maps is a geographic internet service that allows you to search and view maps of a large part of the Earth. Accessible from website, or from mobile app (nowadays but not at launch). In addition to this you can search for services in particular places, including restaurants, monuments and shops. You can also look for a possible road route between two points that can be displayed. As well as satellite photos of many areas with different degrees of detail (for the areas that have been covered by the service, in many cases it is possible to distinguish houses, gardens, roads and etc).

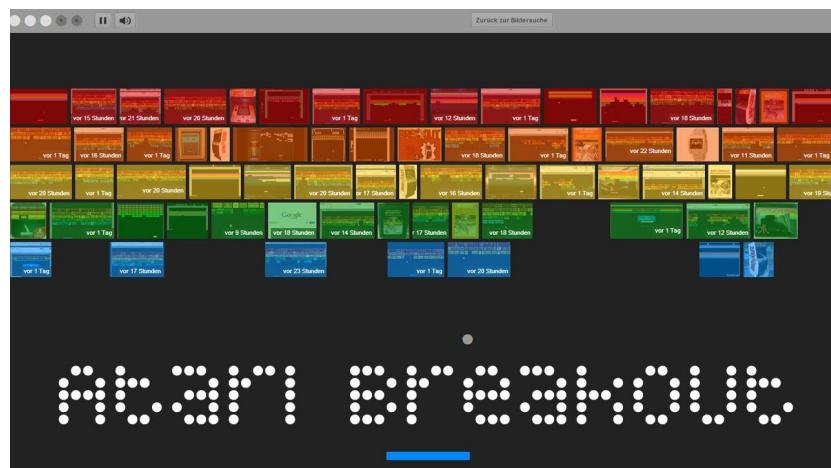
In 2005 YouTube was born, which soon became a quality standard. Google tried to compete with YouTube by launching its "Google Video" platform. YouTube's popularity was on the rise and continuing to support Google Video would have been a waste of time. Google therefore decided to make it short and bought YouTube for 1.65 billion dollars in 2006.

Today, YouTube is one of the most influential free streaming platforms. Google has introduced an AdSense-based advertising system, thus allowing creators to earn money with their videos.

One of the most important applications published by Google is without doubt Google Chrome Web Browser. At first, Google CEO Eric Schmidt opposed the development of an independent web browser for six years. He stated that "at the time, Google was a small company", and he did not want to go through "bruising browser wars". After co-founders

Sergey Brin and Larry Page hired several Mozilla Firefox developers and built a demonstration of Chrome, Schmidt said that "It was so good that it essentially forced me to change my mind." The Chrome Web Browser was first released in 2008 for Microsoft Windows, and was later ported to Linux, macOS, iOS, and (spoiler) Android where it is the default browser built into the OS. Chrome broke a balance that had existed for years. It soon conquered a large part of the market by converting users of Internet Explorer and Mozilla Firefox. Google chrome has a minimalist interface, with a few buttons and various settings (subsequently standardized in almost all browsers). One of the most interesting news is the omnibox, a fusion of the url bar with the google search bar, which allows you to use the search engine at any time. Furthermore, Chrome has a reputation for being the fastest browser.

Interesting things about Google



Google was originally named

Backrub



Google.com

Googlr.com

Gogle.com

Doodles

The first doodle ever created was a Burning Man. In fact, Page and Brin wanted to let people know that they had been to the Burning Man Festival, so they put this figure behind the second "o" inside the Google logo. Up to 2020, over 4000 doodles have been made.

Easter Eggs

At Google are pranksters, so there are several nice searches that will lead to particular results! Searching for words like "Thanos", "Super Mario Bros" or "Sonic" will bring up little buttons with some very nice effects. There are also several games that you can play within web pages or developed by Google as flash applications, for example snake or pacman!

Backrub?

The original name of Google was Backrub. The birth of the name Google instead derives from a spelling mistake. In fact, the name is the indirect child of the word "googol" which means "very large number" (10¹⁰⁰). The mispronouncing pleased the founders so much that they used it as the name of the company.

A lot of Domains

Google has several domains for its page! These include many of those that would result from a spelling error, for example "Gooogle.com" or "Googlr.com".

Apple



Steve Jobs



”The people who are crazy enough to think they can change the world, are the ones that do”
Steve Jobs

History of the iMac





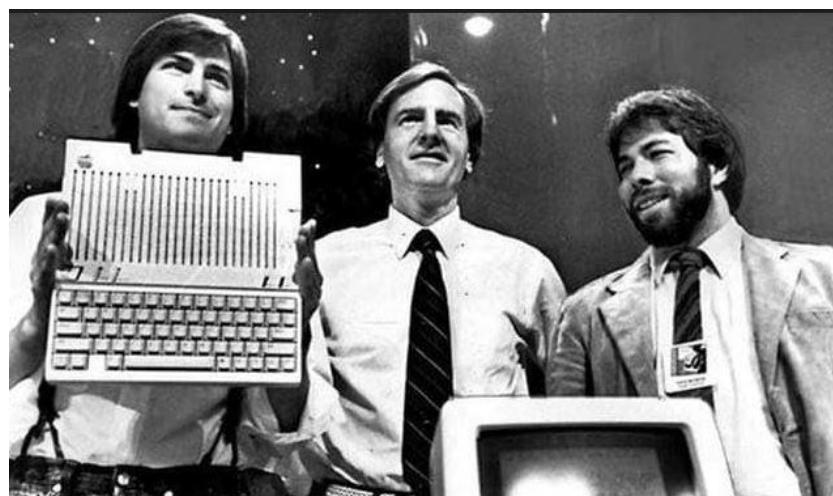
Steve Jobs rejuvenated Apple with the first iMac. Its colorful, translucent prompting other computer makers to move away from their standard gray boxes. The iMac was also famous for what it didn't have: A floppy disk drive. Jobs decided the world would move to CDs and Internet downloads and away from disks. It was a controversial move, but he was right. The iMac is the machine that famously saved Apple but it didn't stop there. Rarely standing still, it has kept at the forefront of Apple design, yet today's iMac has the same design goals it always has

In the late '90s and early aughts, MP3 players were known, well, as MP3 players. However, when Apple launched the iPod on October 21, 2001, it was such a huge success that it only took a couple of years for most people to simply start using the name "iPod" whenever they referred to an MP3 player. The iPod became the primary driver of Apple's renaissance. Analysts called it a "halo" product that drew people into Apple's stores, where they sometimes bought other products too. Apple had sold 125,000 iPods by the end of 2001; it sold a flabbergasting 225 million by 2010. Coupled with the music management/online music store one-two punch that was iTunes, the iPod turned out to be one of the most successful gadgets of all time. one-two punch that was iTunes, the iPod turned out to be one of the most successful gadgets of all time.

Steve Jobs showed off Apple's first iPhone during a keynote presentation at the 2007 Macworld Expo in San Francisco. He said Apple would "reinvent the phone." He was right.

The device went on sale in the US on June 29. Since then, Apple has sold more than 2 billion iPhones, making it one of the largest phone makers in the world. The day the iPhone was announced, the company also changed its name from Apple Computer to Apple Inc.

Apple fun facts!





The third founder

Apple originally had three co-founders. The third co-founder, a man named Ronald Wayne, left the company only 12 days after it was founded. He sold his 10% share for only \$800 and got an additional payout of \$1,500. If Wayne stayed with the company, his shares would be worth today around \$60 billion!

iPod easter egg

With the first Apple iPod, an Easter Egg was implanted. The way to get the Easter Egg is to go to the About menu and hold down the center button for just a few seconds. Users could then see and play a game called Breakout. The game had previously been developed by Apple co-founders Wozniak and Jobs when they worked at Atari.

Why Apple?

The name Apple came from founder Steve Jobs like of the fruit. Mystery surrounded the reason for the name Apple, but in truth it was just the fruit that Jobs liked and named the company after that.

”i” Mac

The ”i” in 1998’s ”iMac” is for ”Internet,” since it originally took only two steps to connect to the web, in case you were wondering. But Apple has also said that it stands for ”individuality” and ”innovation.” The naming scheme would stick around through the iPhone and iPad.

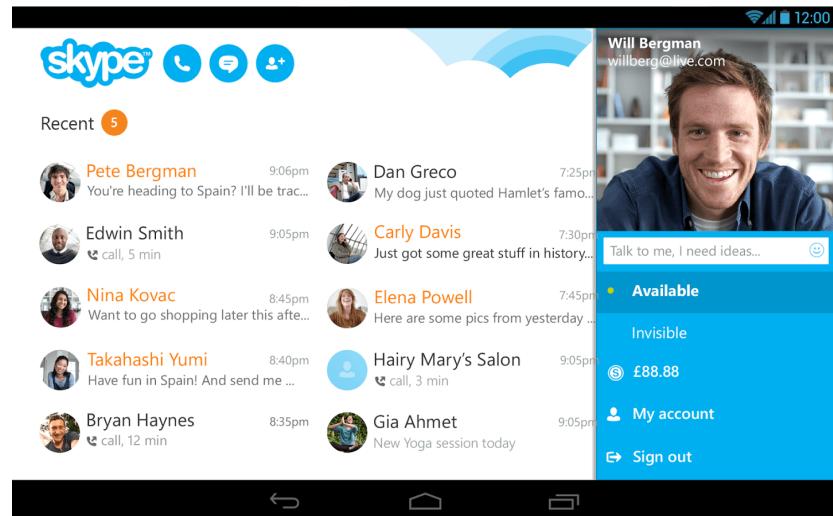
Microsoft

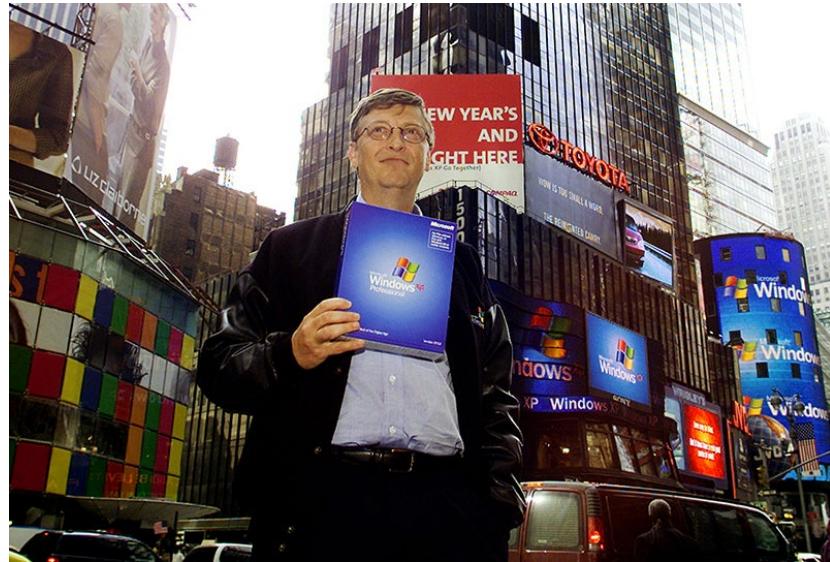


Who is Bill Gates?



”Success is a lousy teacher. It, seduces smart people into thinking they can’t lose” Bill
Gates2017





Windows XP is an operating system that Microsoft introduces in 2001. It served as an innovation of the Windows NT kernel and a successor to Windows me and Windows 2000, however it was ultimately succeeded by the infamous Windows Vista in 2006. The reason why Windows XP is one of the most important launches of a new operating system, because it was the most stable OS launched by Microsoft. It was very stable and was known to till date to be the fastest OS Microsoft has launched. Along with that variety of machines could run it, even if there were hardware were very limiting.

Some of its features included: Automatic Updates Multilingual Support (Professional Edition) Remote Desktop (Professional Edition) Faster OS overall

Even though Microsoft Office was introduced 1990, its application in 2000s became very apparent. This was due to many new software coming with the Office bundle, which not only were appealing to the businesses, but it later became a necessity to have Microsoft Office in your machine. Microsoft Office, in 2000s was considered an essential for someone from a student to a person working in a company environment. In 2000s Microsoft spent \$1.375 billion to acquire Visio which is a diagramming software as an add-on in the Office software. It is now formally known as the flowchart application.

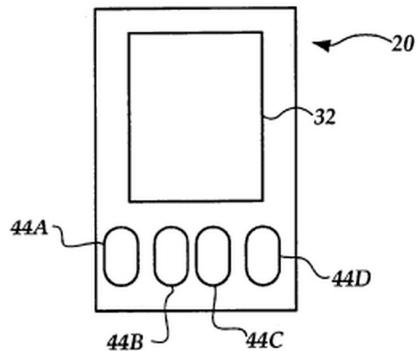
Skype was first released back in 2003, but later when acquired by Microsoft by paying \$8.5 billion, the app during this decade was primarily used for video chatting, messenger, file exchange and other communications. When acquired by Microsoft it was the go-to app for everyone to communicate with people living in different places around the world. Its market share of the international calls went up by 13% to 34% after being acquired by Microsoft. Skype was an replacement was the infamous Microsoft services known as Windows Live Messenger.

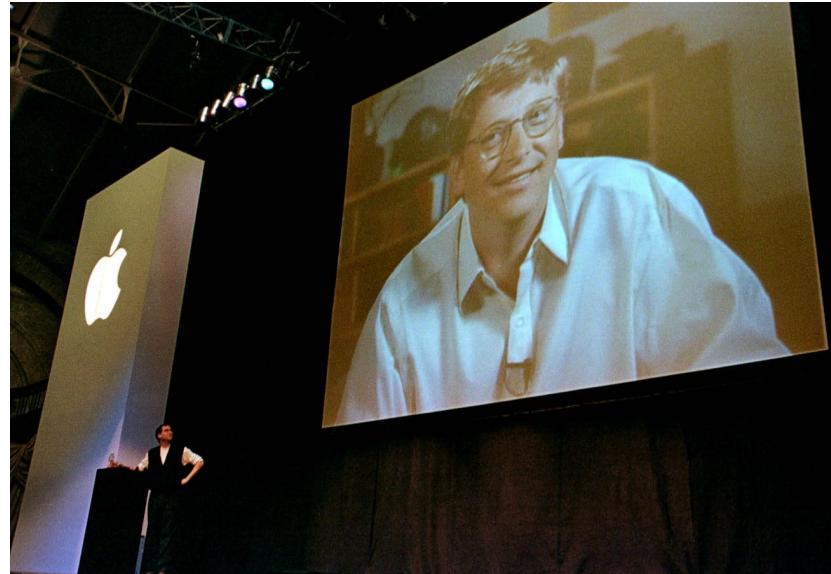
One of the main reasons why Microsoft succeeded was its approach to being graphical. OS did not used to be graphically pleasing as it focused more on features and was targeted for the programmers who knew how to use a computer. Microsoft wanted general public to

use their machines and software without struggling to find their way around the OS. Hence they heavily focused in its Graphical approach, which showed its results in the decade of 2000s, in which the millions of users appealed to Microsoft because of its easy to use OS.

Interesting things about the Microsoft

U.S. Patent Apr. 27, 2004 **Sheet 2 of 6** US 6,727,830 B2





Microsoft is one of the top Patent holders in the U.S:

Microsoft is in the top 5 companies for patents, as they have filled over 3,000 patents each year and they hold almost 10,000 patents. Most of their patents are software related, but one of them was for Xbox 360 games which lets players watch games remotely and another one was for Microsoft Surface.

Brian Eno Composed The Microsoft Sound"

Brian Eno was an influential musician who has worked with the likes of David Bowie and U2 and made the start up tune for Windows 95. He told San Francisco Chronicle that making such short music was funny and exciting for him.

Microsoft Uses Codenames:

From the starting of the first OS, Microsoft is known to be working on several projects under the code names. In Wikipedia a long list could be found which contains all the

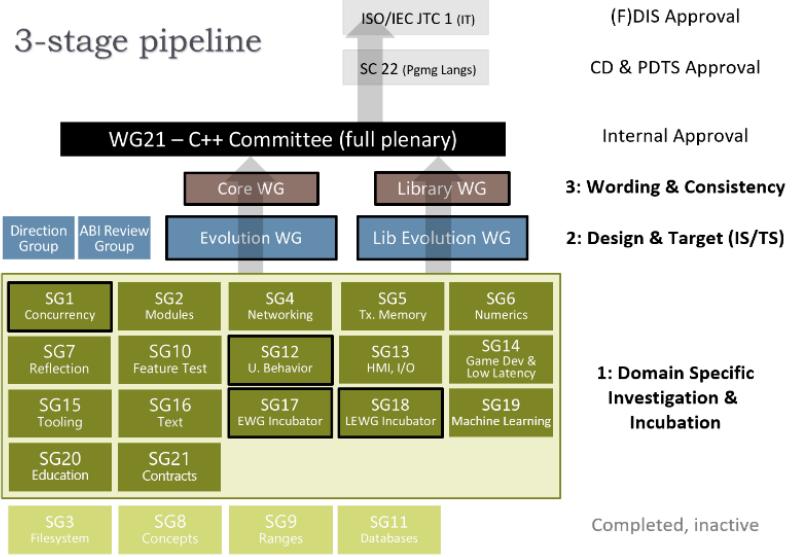
code names which Microsoft has used. Some of the popular code name are Longhorn Lone Start and Vienna.

Microsoft saved Apple:

In 1997 Microsoft saved Apple by investing \$150 million investments. Even though Microsoft had its own hidden motives for such investment, because of this investment it shaped Apple of what it is today. If this investment did not existed the 2000s decade would have been completely different.

Standards in Informatics





Commits on Nov 1, 2020

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Linux 5.10-rc2
torvalds committed 2 days ago
Merge tag 'x86-urgent-2020-11-01' of git://git.kernel.org/pub/scm/in...
torvalds committed 2 days ago
Merge tag 'timers-urgent-2020-11-01' of git://git.kernel.org/pub/scm/lin...
torvalds committed 2 days ago
Merge tag 'iomr-urgent-2020-11-01' of git://git.kernel.org/pub/scm/lin...
torvalds committed 2 days ago
Merge tag 'locking-urgent-2020-11-01' of git://git.kernel.org/pub/scm/...
torvalds committed 2 days ago
Merge tag 'char-misc-5.10-rc2' of git://git.kernel.org/pub/scm/linux/...
torvalds committed 2 days ago
Merge tag 'driver-core-5.10-rc2' of git://git.kernel.org/pub/scm/lin...
torvalds committed 2 days ago
Merge tag 'staging-5.10-rc2' of git://git.kernel.org/pub/scm/linux/ke...
torvalds committed 2 days ago
Merge tag 'tty-5.10-rc2' of git://git.kernel.org/pub/scm/linux/kernel...
torvalds committed 2 days ago
Merge tag 'usb-5.10-rc2' of git://git.kernel.org/pub/scm/linux/kernel...
torvalds committed 2 days ago
Merge tag 'for-linus' of git://git.kernel.org/pub/scm/virt/kvm/...
torvalds committed 2 days ago

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Committee

You can imagine a committee as a group of power oligarchs that control what gets standardized and what doesn't

The example given is the C++ Committee, it is a hierarchy, divided into many groups there are the SG (Study Groups) that accept and review new papers that are submitted about new possible ideas and features to the C++ language or the STL (Standard Library), then if a feature is accepted by the SG it is then sent to Design & Target, where there is an overview of the implementation of the new feature at hand, then it is sent to Wording & Consistency to make sure the feature is consistent and to write the specification for the feature in Standardese (like Legalese but for standards). Then all the members come together to a consensus to see whether there are any conflicts or any disapprovals (consensus by majority). It is then approved into the ISO (International Organization for Standardization) which is a general body that approves international standards.

Problems In the OSS (Open Source Software) world there exists many problems relevant to standards, with the ability to fork repositories, anyone can add anything to an open source repository. In order to maintain order, there are many systems in-place that can restrict who can contribute and who decides to change.

Benevolent Dictators for Life (BDFL)

In many occurrences of OSS, there is one person at the head of a project who is the sole owner and dictator of said project and it is their job to guide it how they see fit, they have the final say in any argument what gets added and what gets removed. Now in OSS, Benevolent Dictators have to stay benevolent because if a large enough majority disagrees with the rulers decisions, there is a high likelihood that the project will be forked (a copy), with new leaders and contributors.

Examples Linus Torvalds

The Linux repository is under the name of its owner Linus, who has the final say in what happens

Guido van Rossum Guido van Rossum was the BDFL of Python until 2018
Software Licenses



GPL Licenses

These licenses require derivates to be OSS. This makes standardization difficult for commercial entities

Apache License

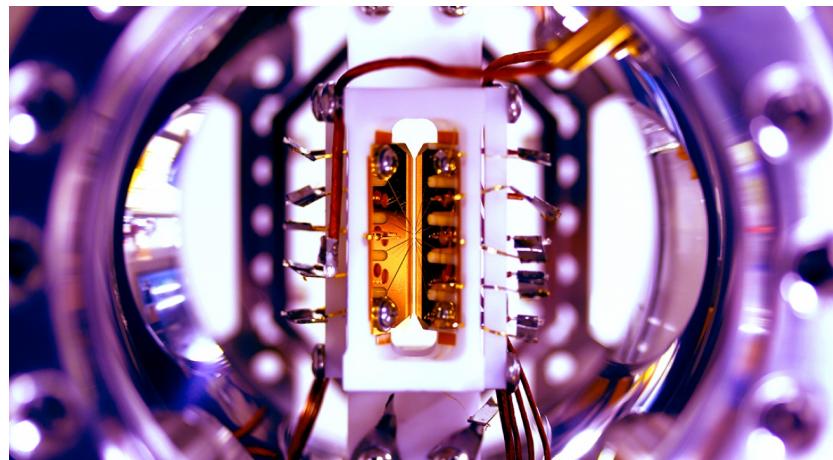
A more permissive license that doesn't require the users to disclose source but only to disclose the changes they've made to the code, to help the community

More Permissive Licenses

The other more permissive licenses usually only have 1 or 2 clauses that require the users to include the Copyright and the License of the used code in the source code or in the final binary. These licenses are the most conducive to standardization because they give users the most power of the code.

4 2011-2020

First Reprogrammable Quantum Computer

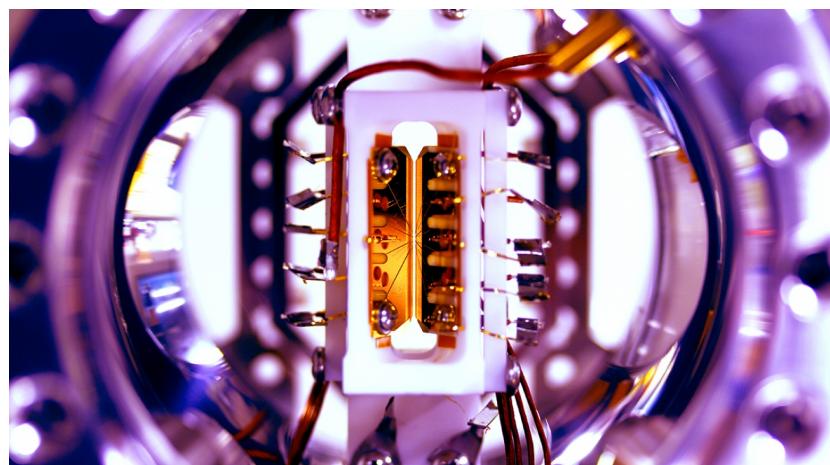


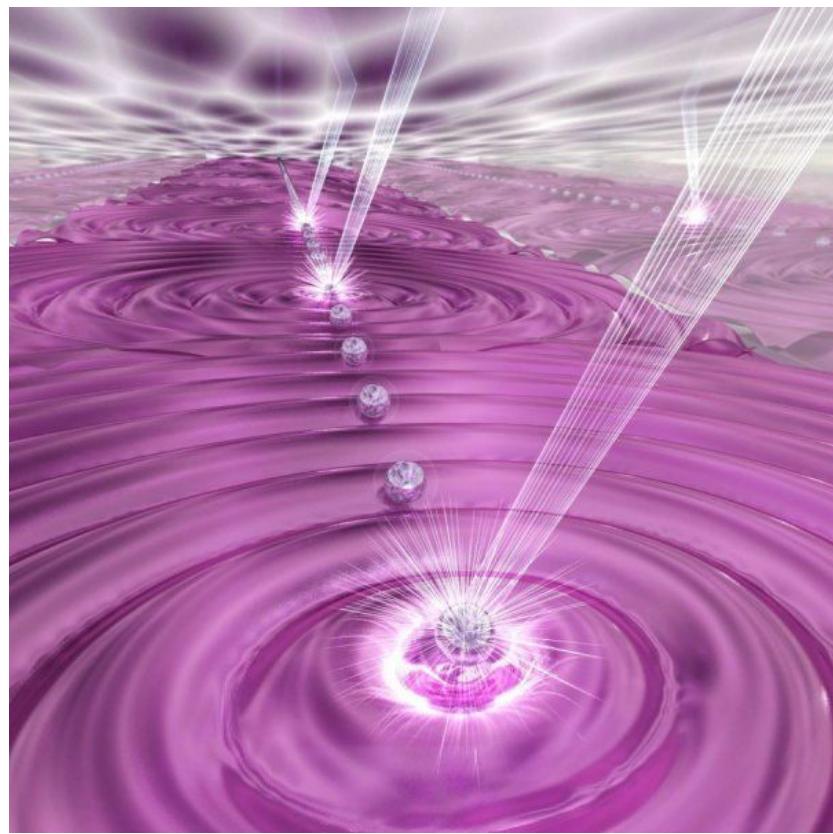
Shantanu Debnath

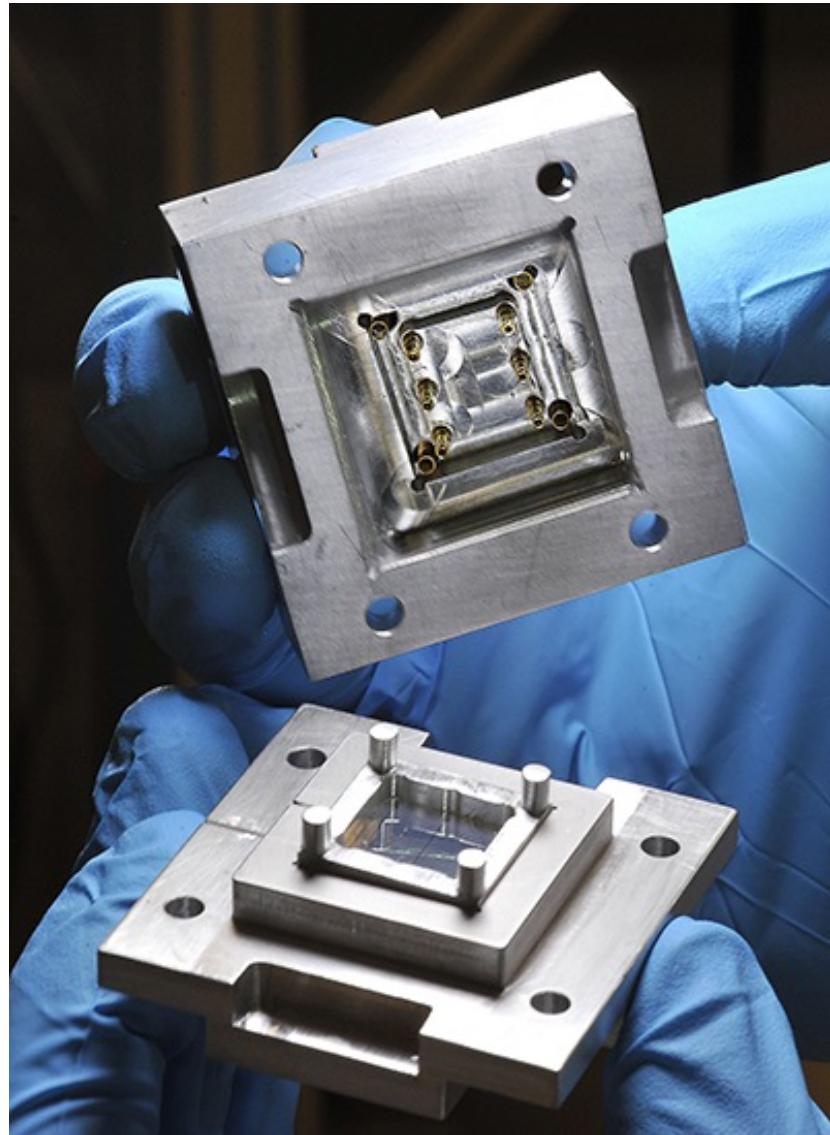


”Until now, there hasn't been any quantum-computing platform that had the capability to program new algorithms into their system. They're usually each tailored to attack a particular algorithm.”

Shantanu Debnath 2016







In August 2016, a group of researchers built the first quantum computer that could be not only programmed but also reprogrammed like the classical computers we regularly use today.

If you do not know yet, quantum computers are machines that use the properties of quantum physics—the physics that explains how everything works to solve complex problems.

Classical computers (laptops, smartphones, etc.) represent data as 1's and 0's, which are binary digits called bits in the on and off state, respectively. Quantum computers, on the other hand, use quantum bits, or qubits. These qubits differ from the classical bits in that they can each represent a 0, a 1, and even both at the same time. This property allows quantum computers to execute instructions at an incredible speed. In fact, sometimes so fast that [they] can solve problems that are impossible or would take a traditional computer an impractical amount of time (a billion years) to solve.

This concludes the first reason why this new development is a milestone: better quantum computers were (and still are) high in demand.

The second reason is that, well, it has never been built before.

The previously built quantum computers can each only run a limited number of algorithms. This new device, on the other hand, can run any algorithm by just making some changes in software. In other words, it is the very first reprogrammable quantum computer.

This computer also called a module is made of five qubits, and each qubit is an ion, or electrically charged particle, trapped in a line using magnetic fields and electrodes. These ions can be manipulated with lasers by giving them precise amounts of energy. This will change how they interact with each other and thus will also allow new algorithms to be programmed and reprogrammed onto the quantum computer.

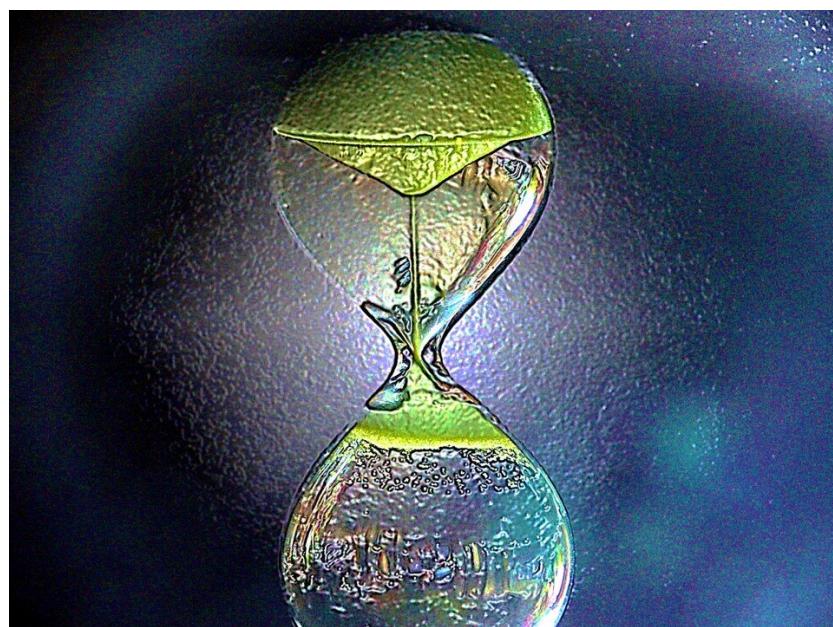
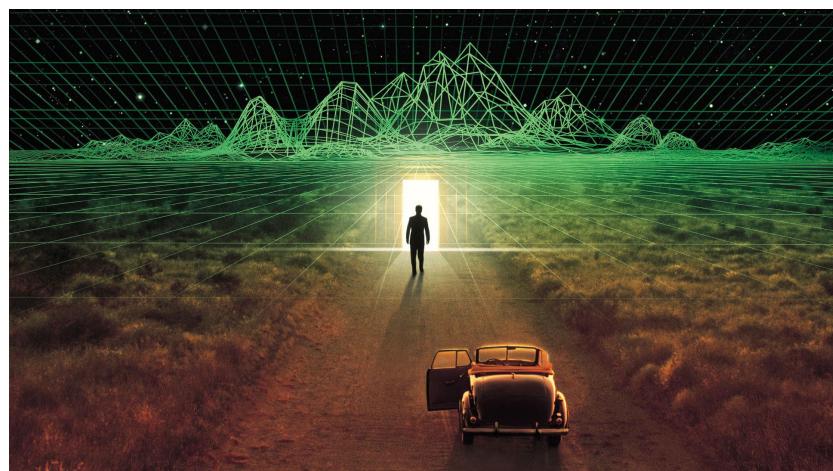
The last and most important reason is that the module works well and has the potential to work even better.

The researchers were able to reprogram the module for three different algorithms, and it was 98 percent accurate overall. These results are impressive given that this is the first quantum computer of its kind. Not to mention, quantum computers are really sensitive; small amounts of heat and collisions with air molecules can cause their qubits to lose their quantum properties, leading to a crash in the system.

The new quantum computer also has a very high potential because it is scalable. In other words, it can be linked to other quantum computers to produce faster and much more useful systems, which is why the computer was named a module. Debnath even said that while [the module is] just five qubits, we know how to apply the same technique to much larger collections.

Interesting things about Quantum Computers







Freezing Qubits

Most quantum computers have to be kept at temperatures near absolute zero. Absolute zero is equivalent to 0 Kelvin, -273.15 degrees Celsius, and -459.67 degrees Fahrenheit. Even the coldest temperature ever recorded in Antarctica, which is -128.6 degrees Fahrenheit, is nothing compared to the temperatures qubits are constantly in.

Nature in Quantum Computing

Quantum computers have the potential to simulate the real world. This is because they are natural. That is, as stated before, they use the properties of quantum physics, which is scientists' best description of the nature of the particles that make up everything around us.

Science Fiction in Quantum Computing

Science fiction seems like reality in the world inside quantum computers. Qubits can teleport information; they can send data to other qubits, even when they are separated by a large distance and not linked in any way. They also can (kind of) go back in time; scientists have been able to perform operations that undo time's effect on qubits.

Parallel Universes

A possible explanation as to why quantum computers work surrounds parallel universes. It has been theorized that qubits can be in the on and off state at the same time because we are looking at them in two parallel universes at the same time.

The Oculus Rift



Palmer Luckey



"If you have perfect virtual reality eventually, where you're able to simulate everything that a human can experience or imagine experiencing, it's hard to imagine where you go from there."

Palmer Luckey 2014





The Rift is the first Head Mounted Display (HMD) which can match the performance of high-end HMDs at a cost which is within the means of the mass consumer markets. We are talking below \$1000 where not long ago HMDs costed \$30,000-\$100,000 and up. Other HMDs in the past few years have targeted consumers as well, of course, but even the better ones like for example eMagine tended to be more expensive (\$1500-\$2000) while delivering a very different and less compelling VR experience. In short, the Rift was cheaper, it worked, and could be run with equipment users probably already had in their house.

The Oculus surpassed its predecessors by implementing new and innovative technologies. The bulky and overly packed designs of the past were replaced with the Rift's slick, simple and minimal build and aesthetic, and the big and complicated sensors used to pinpoint the user's position were ditched in favor of what Oculus calls the constellation: a set of lights located on the front and sides of the headset, which can then be tracked by a camera positioned a few meters in front of the user.

The Rift's low cost and popularity propelled other companies to invest and/or create their own VR headsets in order to cash in on the Rift's success. One of the most notable players is Valve with the Vive (later Index), which implemented handheld controllers and 2 lighthouses, which the user positioned around the room and provided incredibly accurate movement tracking. Another big competitor is Sony, which developed the first VR headset meant for a home console, its very own Playstation 4; this device offered no controllers, instead using the Playstation Move, a set of wireless controllers of a previous generation that resembled WiiMotes and that functioned via light tracking.

Interesting things about the Oculus Rift





Brought to you by Facebook

Less than 2 years after the kickstarter, Oculus VR was bought by Facebook for \$2 billion. Facebooks creator, Mark Zuckerberg, pronounced the Rift one of the coolest things Ive ever seen. In the Rift, he saw something far grander than a mere entertainment device: studying in a classroom full of students, a face-to-face consultation with the doctor or, for Facebooks purposes, sharing experiences more immersive than just photos.

Hands Up

Another big player in the VR industry was Valve with its very own headset called Vive, which among other things included a pair of controllers, one for each hand. To challenge its competitor, Oculus introduced the Oculus Touch, a pair of controllers replacing the original Xbox controller that came with the headset. The big improvement compared to the Vive was that the Touch permitted the user to move individual fingers to create hand gestures in game, while still being comfortable and easy to hold.

Wire-pocalypse is over

Some years after the Rifts launch, a special model was developed, named the Oculus Quest, that could be used wirelessly. It was its own standalone device, with integrated hardware (based on the Qualcomm Snapdragon 835) that could run games and software from the Oculus Store via an Android-based OS. It supported the Oculus Touch controllers, which were tracked using an array of cameras placed on the front of the headset. However, when the controls went outside of the range of the cameras, the Quest uses AI technology to try and pin-point their location.

A bit missing

One of the first prototypes for the Rift, dubbed Dev Kit 1, lacked a feature that you only notice its important once you realize its not there: positional tracking. The headsets sensors

could keep a tab on how the users head was angled (looking up, down, turned to the left, etc), but it had absolutely no idea where the users head was from moment to moment. If you tried to lean in for a closer look at an object, your character in-game would do nothing.

Bam! Immersion shattered. Eventually this was resolved in the Dev Kit 2, alongside a bunch of other improvements.

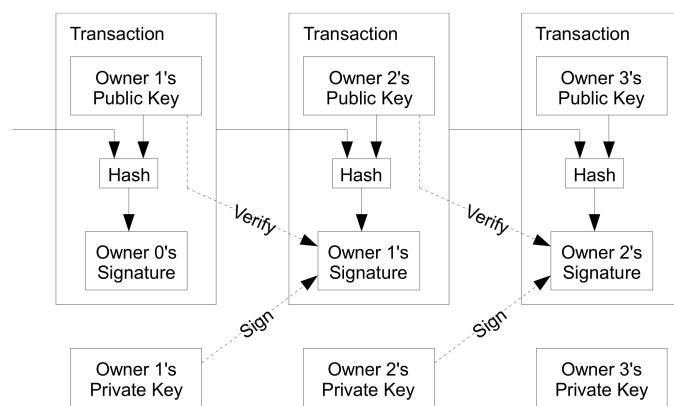
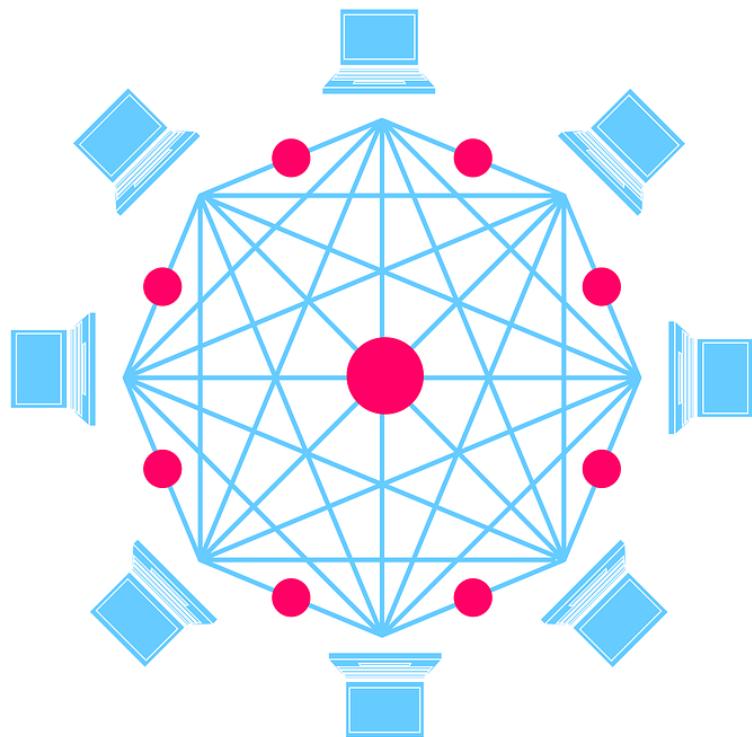
The Bitcoin

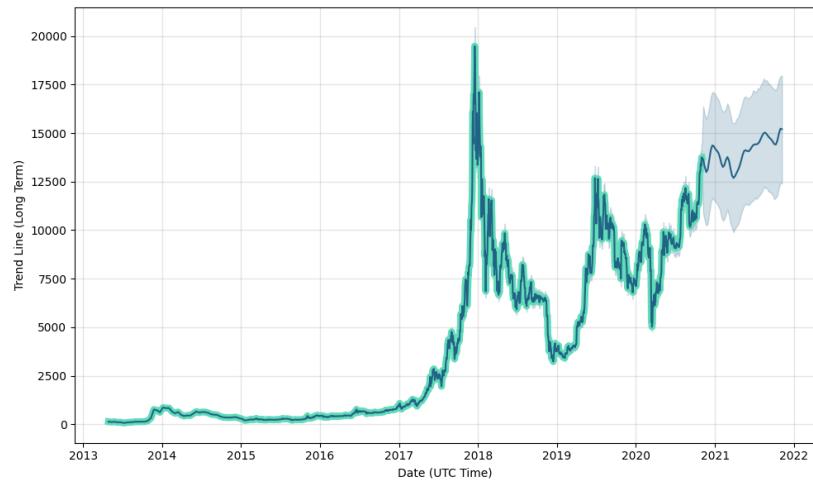


Satoshi Nakamoto And The Bitcoin System



The Times 03/Jan/2009 Chancellor on brink of second bailout for banks.
Text embedded in the coinbase transaction of the bitcoin's genesis block9 January 2019





The Blockchain Database

The most important contribution that bitcoin brought to the world of informatics is the first Blockchain Database. A generic blockchain can be described as a P2P network which maintains some shared state (in the bitcoin system this shared state is the sequence of transactions).

This data is stored in a linked-list-like data structure (which is made of linked blocks, which is where the name blockchain database derives from), new blocks containing new data can be added only at the end of the list and once added the data can't be modified.

Each block points to the block that came before it, the genesis block is the only exception that doesn't point to a previous block since it's the first one and it's normally hardcoded in the software.

To prevent data modification and to guarantee the integrity of the data, Hashing is used. Since the block's hash is calculated based on the previous block's hash but also by the content of the new block, modifying data would change the Hash of the block which contains it, as well as the hash of all subsequent blocks, that's what makes it really easy to spot and correct any modified data in the blockchain.

The creation of a new block, must follow a set of rules called the consensus protocol (in the bitcoin system this protocol is the proof of work), since creating a new block requires a lot of computational power, this protocol usually define a reward for the block creator, in order to incentify people to do so.

Bitcoin is non other than the first application of this new type of database which was used to represent a monetary value. Other applications of this new technology include others cryptocurrencies (like Litecoin and Ether) and more importantly smart contracts.

The First Decentralized Digital Currency Independent From Financial Institutions Or Governments

The bitcoin is the first cryptocurrency, a purely digital asset, used as medium of exchange which is managed controlled and created using cryptography, rather than relying on a central authorities.

With traditional currency, in order to avoid fraud and prevent double spending, we rely on trusted third parties (financial institutions) to process the transactions.

This method has a number of issues, one of the main one is that banks require fees and commission, they can charge up to 10% of the transaction amount, just to send the money. The second main problem is that in order to process the transaction, we are giving away all our personal data, losing our privacy.

Bitcoin solved both of these issues by replacing the trusted party with a peer to peer network and by ensuring anonymity in transactions, using id keys.

In the bitcoin system in order to make a transaction, you will need a bitcoin account, which can be created by generating a cryptographic key pair, a public key and a private key.

The hash of the public key is used as your account address, while the private key is kept secret and it's used to prove that you have ownership of this bitcoin account. In order to send bitcoin, you have to broadcast a signed message (for signing a message the private key is used) with the amount of bitcoins and destination account to the network. This message is sent to all nodes and miners, who will verify that it is correctly formatted, if it is, at this point the transaction is still unconfirmed. Once a miner includes the transaction in a new block the transaction has been confirmed. From here the more blocks exist after your transaction, the more secure your transaction will be.

Since no one knows to whom a key belongs, anonymity is guaranteed and there are no fees or commissions involved, since the miners are rewarded by the system for processing transaction with new bitcoins.

The Best Method To Secure And Maintain Permanent Data

This new monetary exchange system is also far more secure than a centralized one, since it uses an enormous amount of computational power to ensure the uniqueness of the data and the creation of the chain, in order to perform a successful attack on the system, a bad actor would need to operate 51% of the computing power that makes up Bitcoin.

(as for May 2020 Bitcoin has around 47,000 nodes and the number is still growing, rendering a successful attack even more improbable).

In the event that an attack were to happen, the Bitcoin nodes (people whose PCs take part in the Bitcoin network), would likely fork to a new blockchain making the resources used and the attack a waste.

Bitcoin Financial Impact

Bitcoin was also the first digital asset that was accepted by society as a new type of currency. From the mid 2010s, some businesses and no profit organizations, began accepting bitcoin in addition to traditional currencies.

The new currency was basically worthless until February 2011 where for the first time 1 Bitcoin was worth \$ 1.

From that moment on, the currency started gaining a huge exposure, thanks to numerous controversies, like the currency being used in internet's black markets, to pay for illegal goods such as drugs and weapons, but also regarding fraud accusation and bankruptcy of the most popular bitcoin exchange website at the time Mt.Gox who went under in 2014.

During this period the value of 1 bitcoin was fluctuating between 1000 and 200 USD. In 2014, the U.S. Commodity Futures Trading Commission, (a U.S. regulatory agency), approved for the first time in history the listing of an over-the-counter swap product based on the price of a bitcoin.

Microsoft and Dell also started to accept bitcoin as payment in 2014.

More and more businesses began accepting bitcoin as payment, but in 2017 also governments, like Japan and Russia legalized Bitcoins as legitimate payment methods.

On 1 August 2017 something peculiar happened, bitcoin was split into two derivative digital currencies, the Bitcoin (BTC) (that has a chain with 1 MB blocksize limit) and the Bitcoin Cash (BCH) (that has a chain with 8 MB blocksize limit). The split is called "The Bitcoin Cash Hard Fork".

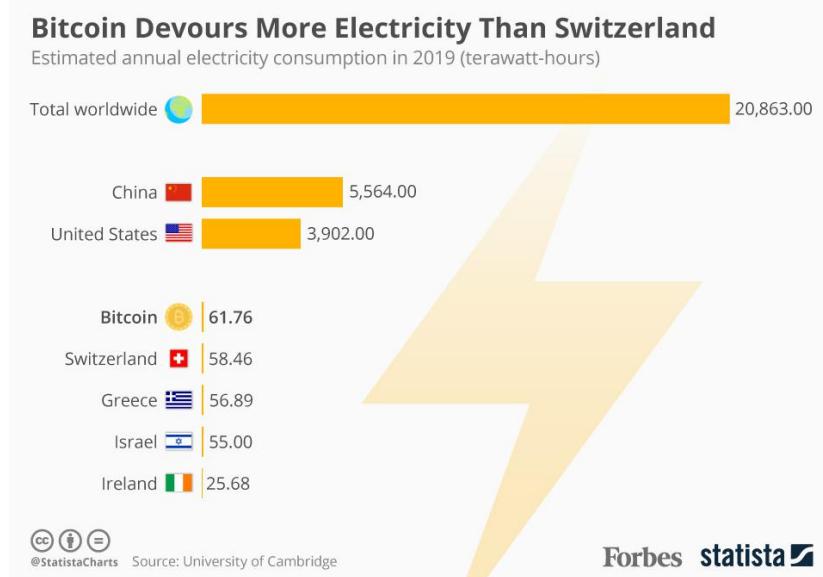
The ever growing interest in the bitcoin currency and its acceptance by governments, caused a very fast increase in its value until December 2017 where it reached its peak value. At that time, a single bitcoin was worth nearly \$20,000.

At this point the speculative bubble created around bitcoins reached its peak and started deflating as people started selling their bitcoins. The price dropped at 3,300 USD per Bitcoin in December 2018.

At this day (08.11.2020) a Bitcoin is worth 15,328.40 USD and we have mined around 18.5 million bitcoins out of the 21 million maximum total bitcoin in circulation.

Interesting things about the Bitcoin





Largest Bitcoin Wallet

The FBI owns around 1.5% of all Bitcoins in the world, which makes their wallet the biggest of the world. Those bitcoins were acquired by shutting down the Silk Road which was a big black market website where Bitcoin was frequently used to make different purchases. By doing so FBI acquired all the Bitcoins that were circulating around the website.

Higher Computing Power Than Supercomputers

The Bitcoin networks have more computing power than supercomputers, to quantify, how much more they have, some experts have estimated that the network's computing power is over 2,046,364 Pflop/s. 500 supercomputers combined have a computing power of around 274 Pflop/s.

Bitcoin Creates A Lot Of Energy

The mining operation requires a tremendous amount of computational power, some estimates were calculated, in order to quantify how much CO₂ the Bitcoin Network uses to process these calculations. Turns out that it uses equate to around one million transatlantic flights, or the equivalent of the energy output of the Republic of Ireland, New Zealand, Hungary or Peru. If bitcoin miners were a country, they would rank 61st in the world in terms of electricity consumption.

Value Overflow Incident

Bitcoin has a limit of 21 million in circulation. On August 2010, a vulnerability in the program's code allowed someone to conduct a transaction, resulting in the creation of over 180 million Bitcoins. The error was taken care of right away, the bitcoin limit was setted back to 21 million and the extra bitcoin were eliminated. This event is known as the value overflow incident.

Neuralink

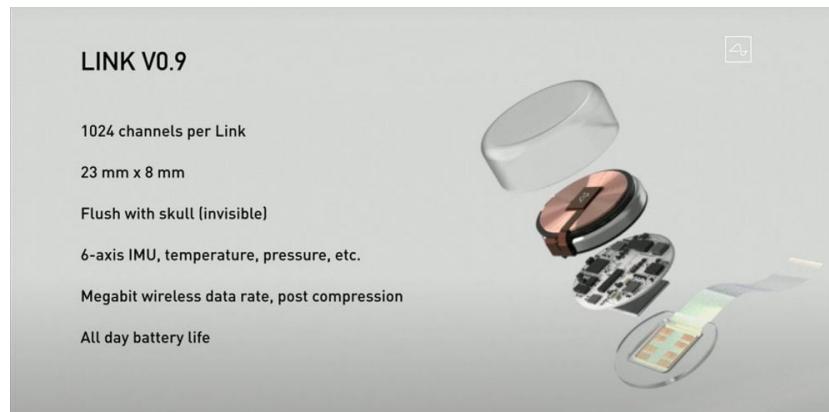
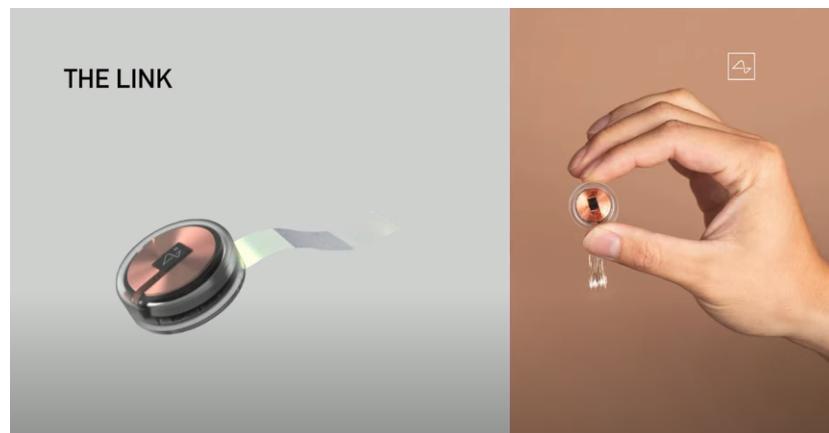
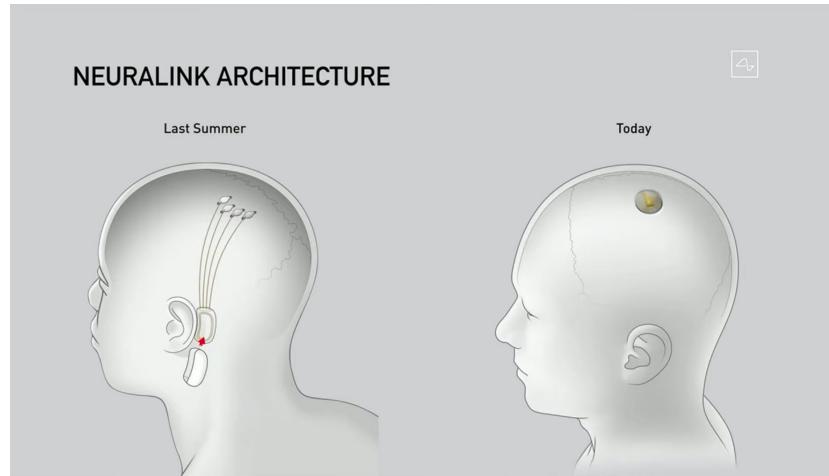


Elon Musk



I'm interested in things that change the world or that affect the future and wondrous, new technology where you see it and you're like, "Wow, how did that even happen? How is that possible?"

Elon Reeve Musk2014

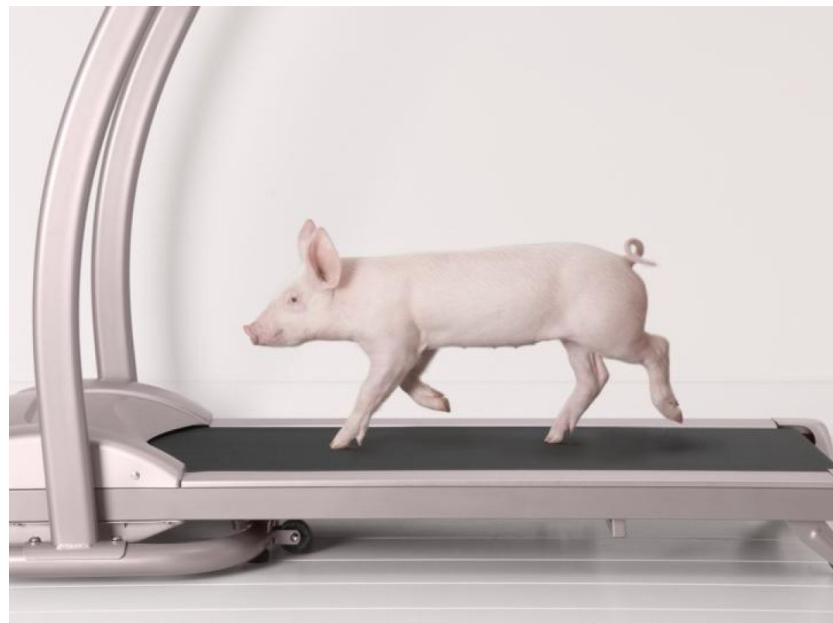
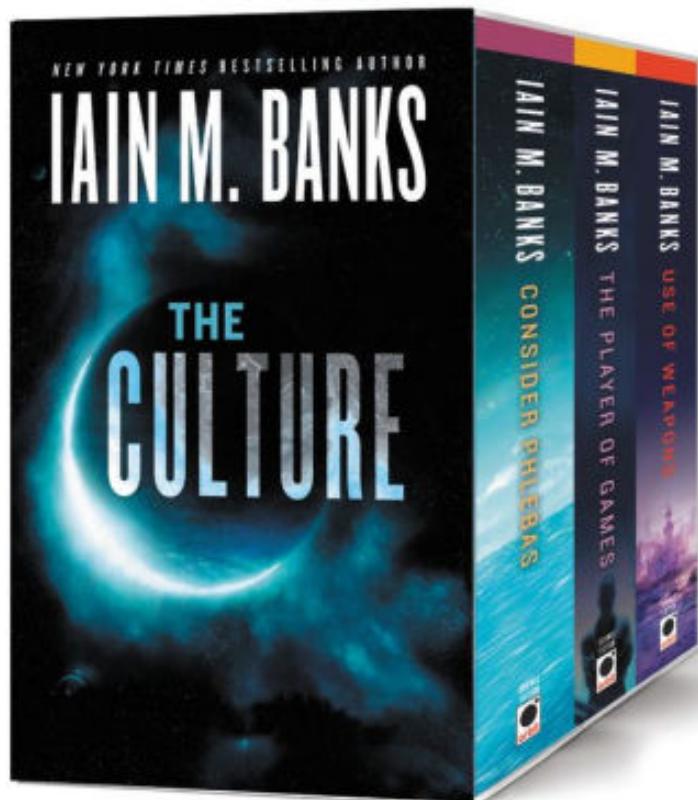


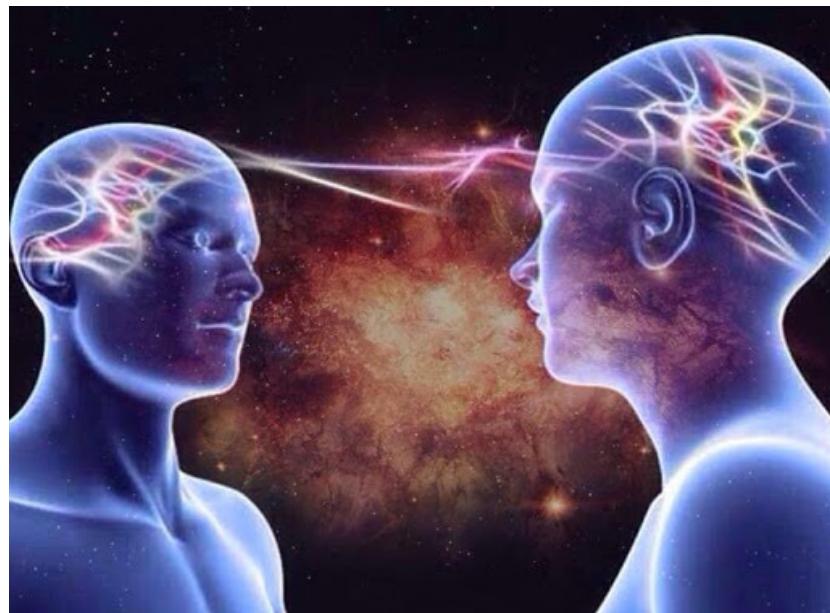
A Direct Link Between the Brain & Everyday Technology. The initial goal of Neuralink will be to help people with paralysis to regain independence through the control of computers and mobile devices. These devices are designed to give people the ability to communicate more easily via text or speech synthesis, to follow their curiosity on the web, or to express their creativity through photography, art, or writing apps.

The Future of Neural Engineering. The Link is a starting point for a new kind of brain interface. As this technology develops, it will be able to increase the channels of communication with the brain, accessing more brain areas and new kinds of neural information. This technology has the potential to treat a wide range of neurological disorders, to restore sensory and movement function, and eventually to expand how we interact with each other, with the world, and with ourselves.

There are 86 billion neurons in your brain, which are connected through synapses and communicate through electric signals. This technology can record electrical signals in the brain by placing electrodes near neurons in order to detect action potentials. Recording from many neurons allows it to decode the information represented by those cells. In the movement-related areas of the brain, for example, neurons represent intended movements. There are neurons in the brain that carry information about everything we see, feel, touch, or think.

Interesting things about the Neuralink





How the idea was born

Musk said his interest in the idea partly stemmed from the science fiction concept of "neural lace" in the fictional universe in *The Culture*, a series of 10 novels by Iain M. Banks.

Why pigs?

The reasoning behind the team's weird choice for experimentation is the similarities the pigs have to offer. For example, the thickness of the skull in pigs is close to that of humans. They are quite robust creatures like little tanks. They bustle around quite a lot and they bump into things and they headbutt each other at times and they're pretty animated so if the device is lasting in the pig then that's a good sign that the device is robust for people. Furthermore, pigs are easy to please. All they need is food. It becomes easy to work with them. They can even be put on a treadmill!

Music streaming

Users will be able to stream music directly into their brains. This will require a hardware call link to be attached to the back of the ear which will directly communicate with the Neuralink to stream music.

Telepathy

Post a complete symbiosis of the tech and the human brain it will also be able to help humans interact with each other without the need to actually talk, Musk said. He didn't specify if we would need to learn a specific language for this but he said it will be possible.

Imagine, the ability to read someone's mind! You're entering the realms of AI, the possibilities are endless and the idea of telepathy is not farfetched with tech like this.

APPLE WATCH



Jony Ive



"The thing is, it's very easy to be different, but very difficult to be better"
Jonathan Paul Ive 2010s



Apple Watch can follow your wellbeing information. It can likewise screen your pulse, circulatory strain, and monitor your activity exercises. It will likewise tell you in the event that it identifies a few inconsistencies in your medical issue.

Additionally the Apple Watch Series 4 and 5 have Fall Detection highlight. The watch utilizes the accelerometer and gyrometer to identify in the event that you have fallen. At the point when an accident like that occurs, a hard fall alert is conveyed. You can either start a call to crisis benefits or excuse the alarm.

In the event that you don't react in 60 seconds, the watch will consequently settle on a crisis decision. Your crisis contacts will be told and shipped off your area.

Regardless of whether you walk, run, hike, or do yoga, an Apple Watch can follow your exercise meetings and show details progressively. That implies showing the separation voyaged, the time passed, pulse, movement, and calories consumed. You can begin working out from the Workout app manually by opening it and browsing 12 distinct alternatives. There's likewise a programmed exercise location. At the point when the watch detects you are starting an exercise, you will get an alarm inquiring as to whether you need to begin following. You can react to that warning and pick the sort of activity.

In case you're stressed over how your Apple Watch will admission during your exercise, don't perspire it. Since the Apple Watch needs uncovered ports, it's entirely water-safe, meeting the International Electrotechnical Commission's IPX7 standard, which means it can endure being lowered in up to a meter of water for 30 minutes. Apple doesn't suggest that, yet the Watch should thoroughly be fine in case you're trapped in a rainstorm or working out.

Interesting things about the Apple Watch







You'll Probably Need To Charge It Every Night

Just like most of the Apple products. Regardless of Apple's endeavors to broaden the life span of the Watch's battery, you'll actually need to charge it consistently. While Apple says the Watch will convey 18 hours of battery life during a mix of time checks, warnings, application use, and exercises with music playback, it truly relies upon which highlights you use and how much the same as a large portion of the Apple items now frequently. Fortunately if your battery gets very low, the Watch can move into a force save mode, which will restrict the watch to simply indicating the time, expanding its power for as long as 72 hours.

Onboard Storage For Music Is Limited

Despite the fact that the Apple Watch is intended to be utilized with an iPhone, there are times you might need to take it out all alone - state, in case you're working out. Luckily, locally available capacity implies you won't need to forego your exercise tunes: The Watch has 8GB of glimmer stockpiling installed, 2GB of which is saved for music. On the off chance that that appears to be irrelevant, remember that Apple's iPod mix has 2GB of capacity, which Apple says can store "hundreds" of tunes.

It Can Be As Expensive As \$17,000, And As Cheap As \$349

In any case, some of them can be truly costly. In view of variety in materials and development, you can address essentially any cost you need for a Watch, from the \$349 aluminum model with a "fluoroelastomer" elastic band, as far as possible up to the \$17,000 rose gold or yellow gold variants with cowhide ties.

There are three Apple Watches, not just one

There is the Apple Watch which is made of stainless steel, the Apple Watch Sport which is made of aluminum, and the Apple Watch Edition which is made of 18-carat gold.

Furthermore, there are additionally two unique sizes for each, even an enormous choice of various, simple to-associate lashes