Digital Equipment Corporation

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Former type	joint-stock company ✏ ⁱ
Industry	Computer hardware Computer software Computer services
Fate	Acquired by Compaq, after divestiture of major assets.
Successor	Compaq (1998–2002) Hewlett-Packard (2002–2015) HP Inc. and Hewlett Packard Enterprise (2015–present)
Founded	1957; 63 years ago
Founder	Ken Olsen, Harlan Anderson ✏
Defunct	1998
Headquarters	Maynard, Massachusetts, United States
Key people	Ken Olsen (founder, president, and chairman) Harlan Anderson (co-founder) C. Gordon Bell (VP Engineering, 1972–83)
Products	PDP minicomputers VAX minicomputers Alpha servers and workstations DECnet VT100 terminal LAT and Terminal server StrongARM microprocessors Digital Linear Tape

Number of employees	over 140,000 (1987)
Website	research.microsoft.com/en-us/um/people/gbell/Digital/timeline/tmlnhome.htm 🖉

Digital Equipment Corporation (**DEC** /dɛk/), using the trademark **Digital**, was a major American company in the computer industry from the 1960s to the 1990s. The company was co-founded by Ken Olsen and Harlan Anderson in 1957. Olsen was president until forced to resign in 1992, after the company had gone into precipitous decline.

DEC was a leading vendor of computer systems, including computers, software, and peripherals. Their PDP and successor VAX products were the most successful of all minicomputers in terms of sales.

DEC was acquired in June 1998 by Compaq in what was at that time the largest merger in the history of the computer industry. At the time, Compaq was focused on the enterprise market and had recently purchased several other large vendors. DEC was a major player overseas where Compaq had less presence. However, Compaq had little idea what to do with its acquisitions,[1][2] and soon found itself in financial difficulty of its own. The company subsequently merged with Hewlett-Packard (HP) in May 2002. As of 2007, PDP-11, VAX, and AlphaServer systems were still produced under the HP name.

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History[edit]

Main article: History of Digital Equipment Corporation

From 1957 until 1992, DEC's headquarters were located in a former wool mill in Maynard, Massachusetts. The headquarter buildings were vacated in 1993, renamed Clock Tower Place,[3] and subsequently redeveloped as Mill & Main Place, a 1.1 million square foot facility for offices and light industry.[4]

Initially focusing on the small end of the computer market allowed DEC to grow without its potential competitors making serious efforts to compete with them. Their PDP series of machines became popular in the 1960s, especially the PDP-8, widely considered to be the first successful minicomputer. Looking to simplify and update their line, DEC replaced most of their smaller machines with the PDP-11 in 1970, eventually selling over 600,000 units and cementing DEC's position in the industry.

Originally designed as a follow-on to the PDP-11, DEC's VAX-11 series was the first widely used 32-bit minicomputer, sometimes referred to as "superminis". These systems were able to compete in many roles with larger mainframe computers, such as the IBM System/370. The VAX was a best-seller, with over 400,000 sold, and its sales through the 1980s propelled the company into the second largest computer company in the industry. At its peak, DEC was the second largest employer in Massachusetts, second only to the Massachusetts State Government.

The rapid rise of the business microcomputer in the late 1980s, and especially the introduction of powerful 32-bit systems in the 1990s, quickly eroded the value of DEC's systems. DEC's last major attempt to find a space in the rapidly changing market was the DEC Alpha 64-bit RISC instruction set architecture. DEC initially started work on Alpha as a way to re-implement their VAX series, but also employed it in a range of high-performance workstations. Although the Alpha processor family met both of these goals, and, for most of its lifetime, was the fastest processor family on the market, extremely high asking prices[5][better source needed] were outsold by lower priced x86 chips from Intel and clones such as AMD.

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Products[edit]

DEC VAXstation

Beyond DECsystem-10/20, PDP, VAX and Alpha, DEC was well respected for its communication subsystem designs, such as Ethernet, DNA (DIGITAL Network Architecture: predominantly DECnet products), DSA (Digital Storage Architecture: disks/tapes/controllers), and its "dumb terminal" subsystems including VT100 and DECserver products.[7]

Research[edit]

DEC's Research Laboratories (or Research Labs, as they were commonly known) conducted DEC's corporate research. Some of them were operated by Compaq and are still operated by Hewlett-Packard. The laboratories were:

- Western Research Laboratory (WRL) in Palo Alto, California, US
- Systems Research Center (SRC) in Palo Alto, California, US
- Network Systems Laboratory (NSL) in Palo Alto, California, US
- Cambridge Research Laboratory (CRL) in Cambridge, Massachusetts, US
- Paris Research Laboratory (PRL) in Paris, France
- MetroWest Technology Campus (MTC) in Maynard, Massachusetts, US

Some of the former employees of DEC's Research Labs or DEC's R&D in general include:

- Gordon Bell: technical visionary, VP Engineering 1972–83; Microsoft Research
- Leonard Bosack
- Mike Burrows
- Luca Cardelli
- Dave Cutler: led RSX-11M and VAX/VMS operating systems development; then led Windows NT development at Microsoft[discuss]
- Ed deCastro: co-founder of Data General Corporation
- Alan Eustace
- Jim Gettys: early developer of X Window System[discuss]
- Henri Gouraud

- Jim Gray
- Alan Kotok
- Leslie Lamport
- Butler Lampson
- Louis Monier
- Isaac Nassi
- Radia Perlman
- Marcus Ranum
- Brian Reid
- Paul Vixie

Some of the former employees of Digital Equipment Corp who were responsible for developing Alpha and StrongARM:

- Daniel W. Dobberpuhl
- Jim Keller
- Rich Witek

Some of the work of the Research Labs was published in the *Digital Technical Journal*,[8] which was in published from 1985 until 1998.[9]

Accomplishments and legacy[edit]

DEC supported the ANSI standards, especially the ASCII character set, which survives in Unicode and the ISO 8859 character set family. DEC's own Multinational Character Set also had a large influence on ISO 8859-1 (Latin-1) and, by extension, Unicode.

Software[edit]

- The first versions of the C language and the Unix operating system ran on DEC's PDP series of computers (first on a PDP-7, then the PDP-11's), which were among the first commercially viable minicomputers, although for several years DEC itself did not encourage the use of Unix.
- DEC produced widely used and influential interactive operating systems, including OS-8, TOPS-10, TOPS-20, RSTS/E, RSX-11, RT-11, and OpenVMS. PDP computers, in particular the PDP-11 model, inspired a generation of programmers and software developers. Some PDP-11 systems more than 25 years old (software and hardware) are still being used to control and monitor factories, transportation systems and nuclear plants. DEC was an early champion of time-sharing systems.
- The command-line interfaces found in DEC's systems, eventually codified as DCL, would look familiar to any user of modern microcomputer CLIs; those used in earlier systems, such as CTSS, IBM's JCL, or Univac's time-sharing systems, would look utterly alien. Many features of the CP/M and MS-DOS CLI show a recognizable family resemblance to DEC's OSes, including command names such as DIR and HELP and the "name-dot-extension" file naming conventions.
- Notes-11 and its follow-on product, VAX Notes, were two of the first examples of online collaboration software, a category that has become to be known as groupware. Len Kawell, one of the original Notes-11 developers later joined Lotus Development Corporation and contributed to their Lotus Notes product.
- The MUMPS programming language, with its built-in database, was developed on the PDP-7, 9, and 15 series machines. MUMPS is still widely used in medical informations systems, such as those provide by Meditech and Epic Systems.

Hardware[edit]

- VAX and MicroVAX computers (very widespread in the 1980s) running VMS formed one of the most important proprietary networks, DECnet, which linked business and research facilities. The DECnet protocols formed one of the first peer-to-peer networking standards, with DECnet phase I being released in the mid-1970s. Email, file sharing, and distributed collaborative projects existed within the company long before their value was recognized in the market.
- The LA36 and LA120 dot matrix printers became industry standards and may have hastened the demise of the Teletype Corporation.

- The VT100 computer terminal became the industry standard, implementing a useful subset of the ANSI X3.64 standard, and even today terminal emulators such as HyperTerminal, PuTTY and Xterm still emulate a VT100 (or its more capable successor, the VT220).

- DEC invented Digital Linear Tape (DLT), formerly known as CompacTape, which began as a compact backup medium for MicroVAX systems, and later grew to capacities of 800 gigabytes.
- Work on the first hard-disk-based MP3-player, the Personal Jukebox, started at the DEC Systems Research Center. (The project was started about a month before the merger into Compaq was completed.)
- DEC's Western Research Lab created the Itsy Pocket Computer. This was developed into the Compaq iPaq line of PDAs, which replaced the Compaq Aero PDA.

Networking[edit]

- DEC, Intel and Xerox through their collaboration to create the DIX standard, were champions of Ethernet, but DEC is the company that made Ethernet commercially successful. Initially, Ethernet-based DECnet and LAT protocols interconnected VAXes with DECserver terminal servers. Starting with the Unibus to Ethernet adapter, multiple generations of Ethernet hardware from DEC were the de facto standard. The CI "computer interconnect" adapter was the industry's first network interface controller to use separate transmit and receive "rings".
- DEC also invented clustering, an operating system technology that treated multiple machines as one logical entity. Clustering permitted sharing of pooled disk and tape storage via the HSC50/70/90 and later series of Hierarchical Storage Controllers (HSC). The HSCs delivered the first hardware RAID 0 and RAID 1 capabilities and the first serial interconnects of multiple storage technologies. This technology was the forerunner to architectures such as Network of Workstations which are used for massively cooperative tasks such as web-searches and drug research.
- The X Window System is the network transparent window system used on Unix and Linux and available on other operating systems such as MacOS. It was developed at MIT jointly between Project Athena and the Laboratory for Computer Science. DEC was the primary sponsor for the project, which was a contemporary of the GNU Project but not associated with it.
- In the period 1994–99 Linus Torvalds developed versions of Linux on early AlphaServer systems provided by the engineering department.[disputed – discuss] Compaq software engineers developed special Linux kernel modules.[10] A well-known Linux distribution that ran on AlphaServer systems was Red Hat 7.2.[11] Another distribution that ran on Alpha was Gentoo Linux.
- DEC was one of the first businesses connected to the Internet, with *dec.com*, registered in 1985,[12] being one of the first of the now ubiquitous *.com* domains. DEC's *gatekeeper.dec.com* was a well-known software repository during the pre-World Wide Web days, and DEC was also the first computer vendor to open a public website, on 1 October 1993.[13] The popular AltaVista, created by DEC, was one of the first comprehensive Internet search engines. (Although Lycos was earlier, it was much more limited.)
- DEC once held the Class A IP address block 16.0.0.0/8.[14]

Corporate[edit]

- Digital Federal Credit Union (DCU) is a credit union which was chartered in 1979 for employees of DEC. Today its field of membership is open to existing family members, over 900 different sponsors, several communities in Massachusetts and several organizations. Many of the sponsors are companies that had acquired pieces of DEC.[citation needed]
- Matrix management

User organizations[edit]
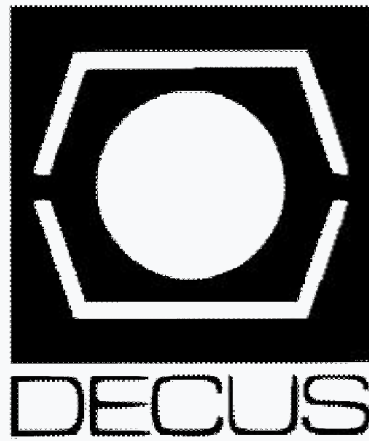
DECUS - Logo

Digital Equipment Corporation

Users Society

Originally the users' group was called DECUS (Digital Equipment Computer User Society) during the 1960s to 1990s. When Compaq acquired DEC in 1998, the users group was renamed CUO, the Compaq Users' Organisation. When HP acquired Compaq in 2002, CUO became HP-Interex, although there are still DECUS groups in several countries. In the United States, the organization is represented by the Encompass organization; currently Connect.

Small Computer Handbook[edit]

Several editions of the **Small Computer Handbook** were published by DEC, giving information about their PDP line of computers. The editions were:

- Small Computer Handbook (1973)[15]
- PDP8/e, PDP8/m & PDP8/f, Small Computer Handbook[16]
- SMALL COMPUTER HANDBOOK (1970 EDITION)[17]

Web sites with photos of their covers include:

- 1967 edition (PDP 8/i)
- SMALL COMPUTER HANDBOOK
- pdp-8/e
- 1973 edition
- Apple Woz SMALLCOMPUTER HANDBOOK snapshot