Engineering Milestones in Digital's History

Digital Equipment Corporation was founded in 1957. Since then, Digital's engineers have consistently delivered outstanding computer systems, network products, software, peripherals, storage systems, and semiconductor devices. This special section in the tenth anniversary issue of the Digital Technical Journal chronicles the engineering milestones in Digital's history from 1957 to May 1995. Many industry "firsts" can be found in this chronology, beginning with the PDP-1 minicomputer through the record-breaking Alpha microprocessor. The milestones noted here represent a range of products and many years of computer engineering design and development.

Digital opens in Maynard, Mass.,with 3 employees and 8,500 square feet of production space in a converted woolen mill. Engineers begin developing a laboratory module.
August 1957

The company's first product, a system module, goes on the market.
February 1958

The world's first minicomputer is the PDP-5. It is Digital's first 12-bit machine.
December 1963

Digital is issued its first patent, on magnetic core memory. The inventors are Ken Olsen and Dick Best.

The PDP-7 is Digital's third 18-bit computer.
December 1964

The PDP-9 is Digital's fourth 18-bit computer system.
August 1966

The PDP-15 is Digital's last 18-bit computer system and the first implemented with integrated circuits.
May 1968

November 1960
The PDP-1, the world's first small, interactive computer, is delivered to Bolt, Beranek and Newman (BBN).

July 1962
Digital ships the PDP-4, its second 18-bit computer.

June 1964
Digital ships its first 36-bit computer, the PDP-6. It is designed to be a powerful, timeshared machine for scientific use.

April 1965
The PDP-8 is Digital's second 12-bit computer system and is the world's first mass-produced minicomputer.

September 1967
Digital's second 36-bit computer, the PDP-10, ships with TOPS-10, the world's first successful commercial timesharing system.

December 1969
At the close of the decade, Digital had been granted 15 patents.

March 1971
The PDP-8/E, featuring a unified backplane bus (Omnibus), is introduced.

June 1972
New models of the PDP-11 are introduced, the -11/05 and the -11/45. The PDP-11/45 provides extended memory and hardware floating-point operations. These are the first microprogrammed PDP-11 systems.

Digital's first 16-bit computer is the PDP-11/20. It includes the world's first unified memory and I/O bus, the UNIBUS. The 16-bit PDP-11 architecture became the world's most successful family of minicomputers. The RSTS timesharing operating system is developed for the PDP-11.
April 1970

The KI-10, Digital's third 36-bit processor, ships in the DECsystem-10 system.
May 1972

Digital announces the RT-11 real-time operating system designed for applications such as monitoring and control.
May 1973

September 1973
Digital develops the DEC Data Communications Message Protocol (DDCMP) as a standard for its future computer-to-computer communications.

September 1974
Digital announces the LA36 DECWRITER. It is the company's first successful printer, and it becomes the de facto market standard.

RSX-11M, a real-time operating system for on-line control, is introduced for use on the PDP-11. RSX-11M concepts are precursors to those in the VMS operating system.
May 1974

Digital's Network Architecture is developed. This architecture will evolve from one focused on the RSX family of operating systems to an architecture that encompasses large, open, distributed networks.

The VAX architecture committee meets for the first time.
April 1975

The PDP-8/A is the last 12-bit system based on discrete logic to be introduced.
January 1975

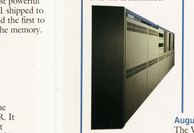
A new software system, the TOPS-20, is based on multiprocess operating system advances. The TOPS-20 operates on the DECSYSTEM-20 system, which was built on the KL-10 processor.
January 1976

Digital announces the F-11, its second 16-bit — and first internally designed — microprocessor. The F-11 ships in the LSI-11/23.
March 1979

Digital ships the DECsystem-2020, its least expensive and last 36-bit computer system.
March 1978

Digital received 74 new patents during the decade.
December 1979

October 1977
The first member of the VAX computer family, the VAX-11/780, is introduced. VAX represents the "virtual address extension" of the PDP-11 system's 16-bit architecture to a 32-bit architecture.



June 1975
The LSI-11 is the world's first 16-bit microprocessor. It ships at the same time as the KL-10, the most powerful 36-bit processor to date.

The "Starlet" engineering team begins work on what will be the VMS (Virtual Memory System) operating system for the VAX computer.

November 1979
The PDP-11/44 system ships; it is the last PDP-11 implemented in discrete logic.

February 1980
The most advanced networking in the computer industry- DECnet Phase III -is introduced. DECnet products made it possible to build networks of over 200 nodes, considered very large in 1980. Phase III was supported on seven operating systems and three hardware families.

August 1978
The VT100 terminal is Digital's first ANSI-compliant video terminal. It becomes the industry's best-selling terminal and the de facto market standard. Earlier in the 1970's, Digital had developed its first terminal, the VT05. A second, the VT52, was the first terminal to be commercially produced.

VAX/VMS version 2.0 is released with the industry's widest offering of languages on one system, including VAX-11 FORTRAN, BASIC, PASCAL, COBOL-74, and PL/1; DSM; and PDP-11 CORAL 66/VAX.
April 1980

The VAX-11/750 is introduced — the second member of the VAX family and the industry's first gate-array-based 32-bit system.

The RM80 disk is announced and is Digital's first product based on Winchester technology.
October 1980

June 1980
Digital, Intel, and Xerox cooperate in the Ethernet local network project. The Digital LAN products that built on Ethernet technology allowed minicomputer, terminal servers, and network devices to be connected with ease.

April 1982
The VAX-11/730 is the third and—at the time announced—the lowest cost member of the VAX family.

Digital announces the ALL-IN-1 integrated office software. It runs on a network and combines applications such as word processing, mail, calendars, and databases.

Digital introduces a range of personal computers—the Professional 300 series based on the PDP-11, the Rainbow 100 based on the Intel 8086, and the DECmate II based on the PDP-8.
May 1982

DECnet Phase IV is introduced, significantly increasing the number of nodes possible in a network from hundreds to many thousands. DECnet Phase IV began the migration from old point-to-point networks to the new multipoint Ethernet. Concepts in the DECnet architecture were incorporated in international standards.
October 1983

June 1982
RA60 and RA81 disks and Digital Storage Architecture advance Digital to the forefront of storage technology.

Digital ships the HSC50 controller, its first intelligent disk subsystem.
May 1983

DECtalk, a text-to-speech system that allows computers to talk, is announced.
December 1983

August 1983
The J-11, Digital's last 16-bit microprocessor, and the first in CMOS technology, ships in the LSI-11/73.

April 1983
Digital announces VAXclusters, a closely coupled structure of VAX computers that operate as a single system.

April 1984
Digital announces the Rdb relational database management system.

October 1984
The VAX 8600 system is the first VAX implementation in ECL technology and the first to include macropipelining.

Digital introduces the VAXstation I, the company's first true 32-bit single-user workstation, and the DECmate III, the last 12-bit computer system.

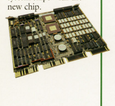
ULTRIX version 1.0 is introduced—Digital's implementation of the UNIX operating system.
July 1984

Digital introduces the VAX ACMS (Application, Control and Management System), which is its first transaction processing product.
January 1985

Digital becomes the first company to register a new semiconductor chip under the Semiconductor Protection Act of 1984 (the MicroVAX II chip).
July 1985

Announcement of the DECconnect wiring strategy and related products and services extends Digital's networking leadership.
February 1986

May 1985
The MicroVAX chip is Digital's first 32-bit microprocessor and the first manufactured with internally developed semiconductor technology. The MicroVAX II system ships with the new chip.



January 1986
The VAXstation II /GPX is Digital's first technical workstation with accelerated graphics.

The VAX 8200 and 8800 systems ship. These are the first VAX systems to support dual processors. Both incorporate a new high-performance I/O bus, the VAXBI.

September 1986
The VAXmate is Digital's second-generation personal computer and pioneers the concept of a diskless, network-connected PC.

September 1987
The CVAX chip, Digital's second 32-bit microprocessor design and the first manufactured with internally developed 2.0-micrometer CMOS technology, ships in the MicroVAX 3500/3600.

January 1988
Digital extends its Network Applications Support (NAS) facilities to integrate MS-DOS, OS/2, and UNIX systems into the open DECnet/OSI network environment.

Digital introduces Local Area VAXcluster systems, extending distributed computing to the work group.
November 1986

Digital introduces the VAX 6000 system, based on the CVAX chip. VMS version 5.0 is released in September; with symmetric multiprocessing, this version provides a high degree of parallelism and effective use of multiprocessors. The VAX 6000 becomes the most successful mid-range computer family in Digital's history.
April 1988

The VAXstation 2000 is Digital's first workstation with a cost of less than $5,000. It becomes the highest volume workstation in the industry.
February 1987

The CVAX+ chip, manufactured in 1.5-micrometer CMOS technology, ships in the MicroVAX 3800/3900 and VAX 6300 systems.
January 1989

Digital begins shipment of its second-generation LAN products, which are based on the ANSI/FDDI 100-megabit per second token-ring standard. Digital is among the first companies to ship products based on FDDI.

The 20th anniversary of the introduction of the first PDP-11 computer is marked by the introduction of two new PDP-11 systems: MicroPDP-11/93 and PDP-11/94. The longest-lived family of general-purpose computers has included over 20 members. More than 600,000 have been installed.
May 1990

The VAX 9000 mainframe is introduced. It incorporates numerous technological advances, including high-density ECL macrocells, multichip module packaging, and heavily macropipelined architecture. The VAX 9000 is Digital's last system not based on microprocessor technology.
October 1989

Adding fault-tolerant technology to the VAX family, Digital introduces the VAXft 3000 system.
February 1990

December 1989
Digital was granted 305 patents during the decade, a 240% increase over the previous ten-year period.

July 1989
The Rigel chip set, Digital's third 32-bit microprocessor design, is manufactured in 1.5-micrometer CMOS technology. The chip set ships in the VAX 6400 system and, somewhat later, in the VAX 4000 system. Rigel is the first implementation of the vector extensions of the VAX architecture.

July 1988
Digital introduces the DECtp systems environment which integrates the capabilities necessary to build large-scale transaction processing applications.

October 1990
The Mariah chip set, an improvement on the Rigel chip set, is manufactured in 1.0-micrometer CMOS technology and introduced in the VAX 6500 system.

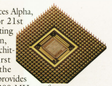
Digital announces its intention to "open VMS" — to add to the VMS operating system support for the widely accepted POSIX standards of the IEEE.

March 1990
Easynet, Digital's internal computer network, adds its 50,000th node and is the largest private data network in the world.

Digital introduces DECnet Phase V which supports OSI standards and networks of essentially unlimited size.
June 1991

The NVAX chip, Digital's fourth VAX microprocessor, is implemented in 0.75-micrometer CMOS technology and ships in the VAX 6000. NVAX incorporates the pipelined performance of the VAX 9000 and is the fastest CISC chip of its time.
October 1991

Digital announces Alpha, its program for 21st century computing and a new, open, 64-bit RISC architecture. The first Alpha chip is the 21064, which provides record-setting 200-MHz performance.



February 1992

November 1991
Digital and Microsoft announce an alliance allowing Microsoft Windows to retrieve and exchange data with local area network servers running Digital PATHWORKS software.

September 1991
The industry's first implementation of an object request broker is shipped, under the name Application Control Architecture (ACA) Services (now called ObjecBroker). Digital subsequently made significant contributions to the Object Management Group's Common Object Request Broker Architecture (CORBA).

September 1992
Digital introduces the DECpc LP series, its first internally designed, industry-compatible PCs.

Digital introduces 64-bit computing with five new Alpha computer systems, the OpenVMS operating system, multiple compilers and networks, and new open business practices.
November 1992

July 1992
The VAX 7000, Digital's most powerful VAX system, is introduced. It is field-upgradable to the Alpha 64-bit processor.

Digital ships OSF/1 UNIX for Alpha systems.
March 1993

Digital delivers its first video-on-demand system for an early broadband communications trial.
October 1993

September 1993
Digital and Microsoft ship the Windows NT operating system for Alpha systems.

Digital introduces GIGAswitch/FDDI, the world's first LAN backplane switch for FDDI, with more than 3 gigabits per second of bandwidth.

November 1993
Digital announces more than 150 client-server products and services, including the second generation of Alpha systems and LinkWorks software, a new framework for work groups.

Digital ships the DECpc XL, the world's most expandable PC at the time and the first to be upgradable to an Alpha processor.

July 1994
The 21064A chip, an improved 21064 in 0.5-micrometer CMOS technology, sets new performance records with its 275-MHz operations.

Digital introduces the AlphaServer 2100 system. Supporting up to four processors, the industry-standard PCI bus, and three operating systems, it met engineers' goal of price/performance leadership.
April 1994

OSF/1 version 3.0 ships with symmetric multiprocessing support and the first wave of cluster capability.

Digital describes the 21164, its newest Alpha microprocessor, which provides peak processing power of more than one billion instructions per second. The chip is the industry's first to operate at 300 MHz.
August 1994

Digital introduces its Venturis family of desktop PCs for general business use.
October 1994

September 1994
Digital introduces its CelebrisTM family of performance-oriented desktop PCs.

November 1994
With the introduction of the GIGAswitch/ATM system and the ATMworks 750 adapter, Digital has the highest performance ATM products in the industry.

March 1995
Digital ships the industry's first commercial high-performance Fortran compiler in DEC Fortran 90.

May 1995
Patents issued to Digital now number 1521; 1127 patents were granted in the last five years.

Digital introduces the HiNote Ultra. Only 1-inch thick and weighing less than four pounds, the Ultra is the first portable computer to combine light weight with desktop functionality.
December 1994

Digital introduces the AlphaServer 8400, its most powerful computer system. Supporting up to twelve 21164 processors and 14 gigabytes of memory, the 8400 creates breakthroughs in large-database performance.

Digital outlines its plan for virtual networking and the integration of LANs, WANs, and ATM.
April 1995

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This chronology is based on the list of milestones in Digital At Work *published by Digital Press, 1992. The list has been updated and considerably expanded with information from Digital's Corporate Archives. Photos are courtesy of Digital's Corporate Photo Library.*