Mentor Graphics

Mentor Graphics

Type	Subsidiary of Siemens
Industry	EDA, Embedded Software
Founded	1981
Founder	Tom Bruggere
Headquarters	Wilsonville, Oregon, United States 45°19′10″N 122°45′46″WCoordinates: 45°19′10″N 122°45′46″W
Products	Nucleus OS, Sourcery CodeBench, ModelSim/QuestaSim, Calibre, Veloce
Revenue	▲$1.28B USD (2017)[1]
Net income	▲$155 million USD (2017)[1]
Total assets	• ▲US$ 1.745284 billion (2013) [2] • ▲US$ 1.550675 billion (2012) [3]
Number of employees	5,968 (2017)[4]
Parent	Siemens
Website	mentor.com

Mentor, a Siemens Business is a US-based electronic design automation (EDA) multinational corporation for electrical engineering and electronics.

The company was founded in 1981 and sold to Siemens in 2017.

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History

Mentor Graphics was founded in 1981 by Tom Bruggere, Gerry Langeler and Dave Moffenbeier. The first round of money, worth $1 million, came from Sutter Hill, Greylock, and Venrock Associates. The next round was $2 million from five venture capital firms, and in April 1983 a third round raised an additional $7 million. Mentor Graphics was one of the first companies to attract venture capital to Oregon.[*citation needed*]

Apollo Computer workstations were chosen as the initial hardware platform. Based in Chelmsford, Apollo was less than a year old and had only announced itself to the public a few weeks prior to when the founders of Mentor Graphics began their initial meetings.

When Mentor entered the CAE market the company had two technical differentiators: the first was the software - Mentor, Valid, and Daisy each had software with different strengths and weaknesses. The second, was the hardware - Mentor ran all programs on the Apollo workstation, while Daisy and Valid each built their own hardware. By the late 1980s, all EDA companies abandoned proprietary hardware in favor of workstations manufactured by companies such as Apollo and Sun Microsystems.

After a frenzied development, the IDEA 1000 product was introduced at the 1982 Design Automation Conference, though in a suite and not on the floor.[5]

In 1999 Mentor acquired the VeriBest subsidiary from Intergraph Corp., which included a development office in Huntsville, AL and eliminated one of their direct competitors.[6][7]

In 2002 Mentor made another acquisition by purchasing Marlboro, MA based Innoveda. The acquisition added to the printed circuit board and wire harness design tools that Mentor already had.[8]

In June 2008, Cadence Design Systems offered to acquire Mentor Graphics in a leveraged buyout. On 15 August 2008, Cadence withdrew this offer quoting an inability to raise the necessary capital and the unwillingness of Mentor Graphics' Board and management to discuss the offer.[9] Mentor acquired Flomerics Group plc for $60 million in cash in October 2008, and in August 2009, Mentor completed the acquisition of silicon manufacturing testing company

LogicVision for $13 million in an all-stock deal.[10] Mentor completed the acquisition of Valor Computerized Systems in March 2010 in a cash and stock deal valued at $50 million.[11]

On 22 February 2011, Carl Icahn, an activist investor, made an offer to buy the company for about $1.86 billion in cash.[*citation needed*]

As of 2012, Mentor's major competitors are: Cadence Design Systems, Synopsys, Altium, and Zuken.

On March 3, 2015 Mentor Graphics announced it had acquired the business assets of Tanner EDA.[12]

On 14 November 2016, Mentor Graphics announced that it was to be acquired by Siemens for $4.5 billion, at $37.25 per share, a 21% premium on Mentor's closing price on the previous Friday.[13] The acquisition was completed in March 2017.[14] And then Mentor Graphics became styled as "Mentor, a Siemens Business".[15]

Locations

Mentor product development takes place in the US, Taiwan, Egypt, Poland, Hungary, Japan, France, Canada, Pakistan, UK, Armenia, and India.

Notable persons

James "Jim" Ready, left Mentor in 1999 to form the embedded Linux company MontaVista. Neil Henderson joined Mentor Graphics in 2002 with the acquisition of Accelerated Technology Inc. Stephen Mellor, a leader in the UML space and co-originator of the Shlaer-Mellor design methodology, joined Mentor Graphics in 2004 following the acquisition of Project Technology.

Management

Walden C. Rhines was the company's chief executive officer and president[16] following the acquisition by Siemens, until November 2018 when he became CEO Emeritus. Tony Hemmelgarn is now the president and CEO of Siemens Digital Industries Software, which includes the Mentor product line.

Products

Entrance to company headquarters

Mentor distributes the following tools:

- Electronic design automation for:
  - Integrated circuit layout full-custom and SDL tools such as *IC Station*
  - IC place and route tool: *Olympus-SoC*
  - IC Verification tools such as *Calibre nmDRC*, *Calibre nmLVS*, *Calibre xRC, Calibre xACT 3D*
  - IC Design for Manufacturing tools such as *Calibre LFD, Calibre YieldEnhancer and Calibre YieldAnalyzer*
  - Schematic editors for electronic schematics such as *Design Architect IC* or *DxDesigner*
  - Layout and design tools for printed circuit boards with programs such as *PADS*, *Xpedition Enterprise*, *HyperLynx* and *Valor NPI*
  - Component library management tools
  - IP cores for ASIC and FPGA designs
- Embedded systems Development:
  - Mentor Embedded Linux[17] for ARM, MIPS, Power, and x86 architecture processors
  - Real-time operating systems:
    - Nucleus OS (acquired in 2002 when Mentor acquired Accelerated Technology, Inc.)
    - VRTX (acquired in 1995 when Mentor bought Microtec Research)
  - AUTOSAR implementation:
    - Embedded implementation VSTAR in part acquired from Mecel in 2013[18]
    - Configuration tooling Volcano Vehicle Systems Builder (VSB)
  - Development Tools:
    - Sourcery CodeBench and Sourcery GNU toolchains (acquired in 2010 when Mentor acquired CodeSourcery)
    - Inflexion UI - (Next Device was acquired by Mentor in 2006)
    - xtUML Design Tools: BridgePoint (acquired in 2004 when Mentor acquired Project Technology)
  - VPN Solutions:
    - Nucleus Point-to-Point Tunneling Protocol (PPTP) software
    - Nucleus NET networking stack

        - Nucleus implementation of the Microsoft Point-to-Point Encryption (MPPE) protocol
        - Nucleus PPP software
- FPGA synthesis tools:
    - Precision synthesis - Advanced RTL & physical synthesis for FPGAs
- Electrical Systems, Cabling and Harness design:
    - Capital - a suite of integrated tools for the design, validation and manufacture of electrical systems and harnesses
    - VeSys - a mid-market toolset for vehicle electrical system and harness design
- Simulation tools for analog mixed-signal design:
    - ModelSim is a hardware simulation and debug environment primarily targeted at smaller ASIC and FPGA design
    - QuestaSim is a Simulator with additional Debug capabilities targeted at complex FPGA's and SoC's. QuestaSim can be used by users who have experience with ModelSim as it shares most of the common debug features and capabilities. One of the main differences between QuestaSim and Modelsim (besides performance/capacity) is that QuestaSim is the simulation engine for the Questa Platform which includes integration of Verification Management, Formal based technologies, Questa Verification IP, Low Power Simulation and Accelerated Coverage Closure technologies. QuestaSim natively supports SystemVerilog for Testbench, UPF, UCIS, OVM/UVM where ModelSim does not.
    - Eldo is a SPICE simulator
    - SystemVision is a virtual lab for mechatronic system design and analysis
    - ADiT is a Fast-SPICE simulator
    - Questa ADMS is a mixed-signal verification tool
- Mechanical Analysis Division (formed from the acquisition of Flomerics in 2008):
    - Fluid Dynamics and Heat Transfer tools:
        - Simcenter Flotherm is a Computational Fluid Dynamics tool dedicated to electronics cooling using parameterized 'SmartParts' for common electronic components such as fans, heatsinks, and IC packages
        - Simcenter Flotherm XT is an electronics cooling CFD tool incorporating a solid modeler for manipulating MCAD parts.
        - Simcenter FLOEFD is a 'design concurrent' CFD tool for use in early-stage product design and is embedded within MCAD systems such as Solidworks, Creo Elements/Pro, CATIA V5 and Siemens NX
    - Thermal Characterization and Thermal Interface Material (TIM) Measurement equipment:
        - Simcenter T3STER is a hardware product that embodies an implementation of the JEDEC JESD51-1 standard for IC package thermal characterization and is compliant with JESD51-14 for Rth-JC measurement
        - Simcenter TERALED provides automation of the CIE 127:2007 standard providing total flux, chromaticity and correlated color temperature (CCT) for power LEDs. With T3Ster it provides thermal resistance metrics for LEDs based on the real dissipated heating power.

        - Simcenter DYNTIM extends T3Ster, providing a dynamic thermal test station for thermal conductivity measurements of thermal interface materials (TIMs), thermal greases and gap pads.
    - Simcenter Flomaster is a 1D or system-level CFD solution for analyzing fluid mechanics in complex pipe flow systems (from the acquisition of Flowmaster Ltd in 2012).
    - CADRA Design Drafting is a 2-1/2D mechanical drafting and documentation package specifically designed for drafting professionals. It provides the tools needed to develop complex drawings quickly and easily (from the acquisition of the CADRA product in 2013).

The Veloce product family enables SoC emulation and transaction-based acceleration.

See also

- List of companies based in Oregon