Valid Logic Systems, Inc.

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Date Founded: 1981

CORPORATE STRATEGIC DIRECTION

Valid Logic Systems, Inc., designs, manufactures, markets, and supports hardware and software solutions for electronic design automation (EDA). These systems are used in the development of electronic systems, printed circuit boards (PCBs) and integrated circuits (ICs). Valid provides a broad line of EDA tools addressing both the computer-aided engineering (CAE) tasks of product definition, including design capture and validation, and the computer-aided design (CAD) tasks of physical layout.

Valid's products consist of software, application-specific hardware for IC prototype verification, and hardware and software acquired from third parties. These products are designed to operate on commercially available platforms, such as those of Digital Equipment Corporation, IBM, and Sun Microsystems, Inc. The Company's software is written to run under both UNIX and VMS operating systems.

Valid's products are sold separately as software packages for existing hardware or as turnkey systems combining hardware and software. Valid sells its systems to a variety of customers in the electronic systems manufacturing market, including the computer, semiconductor, telecommunications, instrumentation, automotive, aerospace, and military industries.

Valid markets its products worldwide, primarily through its direct sales force. The Company has direct sales and customer support offices in 28 US cities, 8 European cities, and in Australia, Canada, Japan, South Korea, and Taiwan. Valid is also represented by distributors in various countries. International sales accounted for 48 percent of 1989 revenue, up from 44 percent and 38 percent in 1988 and 1987, respectively. Valid seeks to enhance this global base in order to capitalize on growth surges in specific regions, while reducing the impact from any softening markets.

Revenue for 1989 was $173.9 million,* an increase of 23 percent over 1988 revenue of $141.1 million. Net income for 1989 was $10.0 million, an increase of 29 percent over 1988 income of $7.7 million. The rapid revenue growth over the last two years has elevated Valid to the number two position among worldwide EDA suppliers. Dataquest estimates that Valid Logic Systems captured 6.2 percent of the worldwide EDA market in 1989, up from its 1988 position as the third largest supplier with 6.0 percent of the market. These market share figures are based on Company revenue as a percentage of the total market revenue, which Dataquest estimates at $2.84 billion for 1989.

R&D expenditure totaled $25.4 million in 1989, up from $19.7 million in 1988. These figures represent 14.6 percent and 14.0 percent of total sales, respectively. In 1989, much of this expense was incurred in connection with Valid's efforts to integrate its own product line offerings with those of the companies it acquired. Capital expenditure amounted to $9.3 million in 1989, representing 5.4 percent of total sales.

In June 1990, Valid completed the sale of $11.2 million worth of newly issued voting convertible preferred stock to IBM Corporation. IBM's investment represents an interest of approximately 8 percent in Valid. IBM's stake in Valid may increase over the next four years, up to a maximum of 49.9 percent.

More detailed information is available in Tables 1 and 2, which appear after "Business Segment Strategic Direction" and present corporate highlights and revenue by region. Information on revenue by distribution channel is not available. Table 3, a comprehensive financial statement, is at the end of this backgrounder.

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*All dollar amounts are in US dollars.

BUSINESS SEGMENT STRATEGIC DIRECTION

Valid offers a full line of integrated EDA solutions for both digital and analog CAE, as well as both IC CAD and PCB CAD processes. Valid's new products originate through internal development and occasionally through acquisitions of other companies or product lines. Valid's stated goal is to provide complete design solutions that integrate with the customer's existing engineering, design, and manufacturing environments. To help achieve this goal, Valid provides EDA framework technology supporting its own products and integration of third-party commercial or customer tools.

EDA Framework

Valid's Design Process Framework (also called Valid-Frame) uses a switchboard methodology to provide the tool integration and design management capabilities demanded by users without the limitations in performance and extendability inherent in single database approaches. Four framework "managers"—the Communications Manager, Design Manager, User Interface Manager, and Process Manager—can be "plugged into" by applications using documented programming interfaces. This allows Valid applications or other tools to incorporate framework functionality without database modifications.

CAE Digital Software

ValidGED Graphics Editor is a menu-driven tool used to accelerate design capture. With ValidGED, engineers can create and modify schematic drawings using parts from existing component libraries or from libraries created with ValidGED. ValidGED supports both analog and digital design and allows engineers to create designs at any level, including block diagrams, hierarchical schematics, and flat schematics. Valid's digital and analog libraries each include more than 4,000 commonly used parts. In addition, Valid is supported by over 100 application-specific IC (ASIC) design kits supplied by ASIC vendors and used in the design and simulation of ASICs.

The Logic Workbench is a simulation framework that enables users to analyze and debug their digital designs. It includes a multiwindow display environment, advanced stimulus creation capabilities, and integration features such as cross-probing between schematics and simulation input patterns or output waveforms. RapidSIM, part of the Logic Workbench, is a mixed-level simulation and timing analysis tool that has replaced the Company's original ValidSIM simulator. RapidSIM features a new vendor-definable algorithms capability that enables it to simulate submicron ASICs and high-speed board designs. It also utilizes optimized data structures to provide improvements over ValidSIM in the areas of speed and circuit capacity.

CAE Analog Software

Valid's analog products were obtained through the acquisition of ADT in February 1989. Valid has integrated those products within its EDA product line, linking them with both design capture tools and physical design tools.

The Analog Workbench II was introduced in March 1990 as a continuation of the Analog Workbench developed by ADT. It provides an environment for the simulation and analysis of analog circuits. The Analog Workbench II can be used for both IC and board-level analog designs.

Optional Analysis Modules enable analog designers to evaluate and optimize their circuits with respect to quality, manufacturability, and reliability. Included is the Smoke Alarm stress analysis package; Statistical Analysis, containing statistical, sensitivity, and worst case analysis programs; and the Parametric Plotting analysis package.

Application-Specific Hardware

Valid has discontinued manufacturing of application-specific hardware products for simulation acceleration and hardware modeling.

Valid's two patents for hardware modeling systems have been licensed to Logic Modeling Systems, Inc., of San Jose. Valid resells the Logic Modeling products under the name of Realchip-LM.

PCB CAD Software

Valid offers a broad set of tools for the physical design and analysis of PCB designs. Allegro is a rules-driven system for PCB layout that addresses the needs of high-speed and double-sided board surface-mount design technologies. Thermostats analyzes board designs for component temperature and calculates a board's reliability and susceptibility to noise interference.

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Valid's Signal Noise Analysis is an integrated analysis package that examines the electrical characteristics of high-frequency board designs to help engineering teams achieve proper circuit performance.

IC CAD Software

For full-custom ICs, Valid has a broad line of tools spanning the physical design process. Included are tools for traditional polygon-level editing, as well as higher-level design tools for automated chip assembly and post-layout analysis.

The Construct IC Layout Editor features full GDS II compatibility at both the database and command levels, plus a variety of advanced automation features such as multiple view ports, cut-and-paste editing, and programmable cells. Valid's Compose Hierarchical Chip Assembly Environment is a rules- and netlist-driven design tool for complex chip layout. Compose is integrated with Construct so that ICs can be hand-tailored without database conversion.

Valid also offers the Confirm Physical Verification Tools that provide design and electrical rule checking for both hierarchical and flat layouts. Confirm can be used to extract capacitance and parameters from the physical design for use in post-layout simulations.

Other products include the TIMEMILL+ Digital Timing Simulator, which provides timing simulation of full-custom ICs at the functional, logic, or transistor levels from the design's layout, and the PATHMILL Critical Path Analyzer, which lets users perform critical path analysis on their IC designs either before or after physical layout. The Fast Mask CAM Output Tools deliver CAM output for both optical and electron-beam pattern generation.

TestBRIDGE Software

As electronic designs become more complex, need to link the design environment with the production test environment increases. CAE and CAD tools provide significant amounts of information that may be used in the test process. Valid has developed certain products designed to facilitate the design-to-test transition.

The RapidTEST Concurrent Fault Simulator is a high-speed fault simulator for measuring the effectiveness of test programs in detecting potential manufacturing defects. The Test Prep Automatic Test Point Generator is an automated tool that helps designers avoid the "physical" testability problems associated with tester access requirements.

ASIC Verification

With the acquisition of Integrated Measurement Systems (IMS) in February 1989, Valid is able to offer the series of design verification systems offered by IMS. Each system integrates the functions of individual test instruments into a single unit that offers increased verification performance at a significant cost savings over traditional automated test equipment and instrument clusters.

The IMS product line consists of the Logic Master XL series, which includes the Logic Master XL, Logic Master XL2, the Logic Master Mixed-Signal System, and the XL SCAN module. Logic Master is designed to work with computer systems or terminals to receive and execute test commands and report the results of test procedures. Logic Master may be used with mainframes, minicomputers, or microcomputers, and also may be linked to most CAE workstations.

Further Information

For more information about the Company's business segments, please contact the appropriate Dataquest industry service.

Table 1
Corporate Highlights (Thousands of US Dollars)

	1988*	1989*
Two-Year Revenue	$141,117.0	$173,856.0
Percent Change	60.06	23.20
Capital Expenditure	$9,798.0	$9,308.0
Percent of Revenue	6.94	5.35
R&D Expenditure	$19,733.0	$25,446.0
Percent of Revenue	13.98	14.64
Number of Employees	498	973
Revenue ($K)/Employee	$283,367	$178,680
Net Income	$7,744.0	$10,002.0
Percent Change	(128.79)	29.16

1989 Calendar Year	Q1	Q2	Q3	Q4
Quarterly Revenue	NA	NA	NA	NA
Quarterly Profit	NA	NA	NA	NA

*Financial data for 1988 and 1989 include revenue and assets acquired through the purchase of ADT, IMS, Telesis, and the IC CAD product line from Calma. NA = Not available

Source: Valid Logic Systems, Inc. Annual Reports and Forms 10-K Dataquest (1990)

Table 2
Revenue by Geographic Region (Percent)

Region	1988	1989
North America	56.44	52.00
International	43.56	48.00
Europe	25.00	NA
Asia/Pacific	23.00	NA

Source: Valid Logic Systems, Inc. Annual Reports and Forms 10-K Dataquest (1990)

1989 SALES OFFICE LOCATIONS

The Company has a total of 46 offices.

MANUFACTURING LOCATIONS

North America

San Jose, California; Beaverton, Oregon
  Design verification products

SUBSIDIARIES

Information is not available.

ALLIANCES, JOINT VENTURES, AND LICENSING AGREEMENTS

1990

ExperTest, Inc.
  Valid and ExperTest signed a joint marketing agreement that calls for ExperTest to develop and market a software interface between ExperTest's Test Design Expert (TDX) software and Valid's Design Process Framework.

Minc, Inc.
  Valid and Minc signed an agreement that provides for the integration of Minc's advanced programmable logic device (PLD) and field-programmable gate array (FPGA) design and synthesis technology into Valid's design framework.

Logic Automation, Inc.
  Valid and Logic Automation introduced an expansion of the two companies' software marketing relationship whereby Valid will supply a six-month subscription to the SmartModel library with all new-customer shipments of RapidSIM on the Sun-3 and Sun-4 platforms.

Intermetrics, Inc.
  Valid made an unspecified initial payment to Intermetrics for its VHDL source code after having sold Intermetrics' VHDL tools on an OEM basis for a year. The deal gives Valid an important asset for the military market.

Seattle Silicon, Inc.
  Valid entered into an OEM/Distribution agreement with Seattle Silicon to market the SS ChipCrafter ASIC CAE software package alongside its own products in Taiwan, South Korea, and Japan.

1989

Sun Microsystems
  Valid bundles Sun's workstations with its EDA products. The agreement with Sun, worth $120 million, includes the RISC-based SPARCstation 1 and the SPARCstation 330 and 370 deskside systems. The agreement is valid through November 1990.

IBM
  IBM and Valid agreed to market Valid's CAE software ported to the IBM PC RT. The joint marketing agreement involves Valid's entire range of CAE software, which IBM's Professional Services Group (Dallas, Texas) will integrate, install, and support as turnkey CAE systems.

Apex Microtechnology
  Valid and Apex Microtechnology signed a technology exchange agreement that gives Valid customers analog simulation models for Apex's leading line of analog ICs and gives Apex access to Valid's large analog customer base.

1988

Logic Automation, Inc.
  Logic Automation and Valid agreed to offer Logic Automation's SmartModels on Valid's EDA systems. The agreement resulted from a cooperative marketing arrangement calling for joint development to make all SmartModels compatible with Valid's ValidSIM logic simulator.

MERGERS AND ACQUISITIONS

1989

Analog Design Tools (ADT)
  ADT was acquired by Valid for $35 million in stock. The acquisition helps position Valid in the CAD market, since ADT is a leading supplier of CAE systems for analog circuit design.

Integrated Measurement Systems (IMS)
  IMS was acquired by Valid for approximately $18 million in stock. IMS will enable Valid to provide a full line of design-to-test solutions and

ASIC verification products. The unit will operate as the IMS division of Valid and will remain in Beaverton, Oregon.

1988

Calma

Calma sold its computer-aided chip design business to Valid. Calma is a unit of General Electric USA.

1987

Telesis Systems Corporation

Valid acquired all the outstanding common stock of Telesis and subsidiaries in exchange for 4 million shares of Valid's common stock. Telesis sold EDA workstations and software, and its main product was its PCB layout system. The merger was accounted for as a pooling of interests.

KEY OFFICERS

W. Douglas Hajjar

Chairman of the board, chief executive officer, and director

L. George Klaus

President and chief operating officer

Thomas F. Kelly

Vice president, Finance and Administration, and chief financial officer

Alain Labat

Vice president, International Operations

Robert J. Moore

Vice president, US Sales

Joseph Prang

Vice president, Marketing

Franklin D. White, Sr.

Vice president, Operations

PRINCIPAL INVESTORS

Information is not available.

FOUNDERS

Information is not available.

**Table 3
Comprehensive Financial Statement
Fiscal Year Ending January 1
(Thousands of US Dollars, except Per Share Data)**

Balance Sheet	1988*	1989*
Total Current Assets	$81,749.0	$87,792.0
Cash	13,455.0	9,206.0
Receivables	45,016.0	56,034.0
Marketable Securities	0	0
Inventory	19,718.0	17,669.0
Other Current Assets	3,560.0	4,883.0
Net Property, Plants	$19,319.0	$25,032.0
Other Assets	$11,130.0	$26,822.0
Total Assets	$112,198.0	$139,646.0
Total Current Liabilities	$33,775.0	$38,226.0
Long-Term Debt	$7,279.0	$17,858.0
Other Liabilities	$41.0	$746.0
Total Liabilities	$41,095.0	$56,830.0
Total Shareholders' Equity	$71,103.0	$82,816.0
Common Stock	31.0	32.0
Other Equity	116,676.0	118,820.0
Retained Earnings	(50,100.0)	(40,098.0)
Total Liabilities and Shareholders' Equity	$112,198.0	$139,646.0

Income Statement	1988*	1989*
Revenue	$141,117.0	$173,856.0
US Revenue	79,646.0	91,249.0
Non-US Revenue	61,471.0	82,607.0
Cost of Sales	$85,308.0	$96,803.0
R&D Expense	$19,733.0	$25,446.0
SG&A Expense	$60,828.0	$70,902.0
Capital Expense	$9,798.0	$9,308.0
Pretax Income	$8,475.0	$11,078.0
Pretax Margin (%)	6.01	6.37
Effective Tax Rate (%)	NA	NA
Net Income	$7,744.0	$10,002.0
Shares Outstanding, Millions	30.3	32.6
Per Share Data		
Earnings	$0.26	$0.31
Dividend	0	0
Book Value	$2.35	$2.54

Table 3 (Continued)
Comprehensive Financial Statement
Fiscal Year Ending January 1
(Thousands of US Dollars, except Per Share Data)

Key Financial Ratios	1988*	1989*
Liquidity		
Current (Times)	2.42	2.30
Quick (Times)	1.84	1.83
Fixed Assets/Equity (%)	27.17	30.23
Current Liabilities/Equity (%)	47.50	46.16
Total Liabilities/Equity (%)	57.80	68.62
Profitability (%)		
Return on Assets	8.12	7.94
Return on Equity	14.70	13.00
Profit Margin	5.49	5.75
Other Key Ratios		
R&D Spending % of Revenue	13.98	14.64
Capital Spending % of Revenue	6.94	5.35
Employees	498	973
Revenue ($K)/Employee	$283,367	$178,680
Capital Spending % of Assets	8.73	6.67

*Financial data for 1988 and 1989 include revenue and assets acquired through the purchase of ADT, IMS, Telesis, and the IC CAD product line from Calma. NA = Not available

Source: Valid Logic Systems, Inc. Annual Reports and Forms 10-K Dataquest (1990)

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