Global Market Insight for Information Technology Companies



1995
Publications Schedule

CAD/CAM/CAE/GIS EUROPE

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Perspective	❐	❐	❐	❐	■	❐	❐	❐	■	❐	❐	❐
Newsletters published on an event-driven basis												
Market Analysis	❐	❐	■	❐	■	❐	■	❐	■	❐	■	❐
Newsletters published on an event-driven basis												
User and Distribution Studies	❐	❐	❐	❐	❐	❐	❐	■	❐	❐	❐	❐
Newsletters published on an event-driven basis												
Competitive Dynamics	❐	❐	❐	❐	❐	❐	❐	❐	❐	❐	❐	❐
Newsletters published on an event-driven basis												
Focus Studies	❐	❐	❐	❐	❐	❐	❐	❐	❐	❐	❐	❐
Newsletters published on an event-driven basis												
Electronic Newsletters	■	■	■	■	■	■	■	■	■	■	■	■
Published weekly												
Guides	❐	❐	❐	❐	❐	❐	❐	❐	❐	❐	❐	❐

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Program: CAD/CAM/CAE/GIS Europe
Program Manager: Petra Gartzen

1995 Publications Schedule

CAD/CAM/CAE/GIS Europe

Complete Listing of 1995 Documents

Document Category	Document Type	Document Title	Arrival on Client Desk
Perspective	Dataquest Predicts	TBD	May 1995
	Dataquest Predicts	TBD	September 1995
Market Analysis	Market Statistics	Europe Overview Market Share	March 1995
	Market Statistics	Europe Overview Forecast	May 1995
	Market Statistics	Europe Overview Market Share Update	July 1995
	Market Statistics	France Market Share Update	July 1995
	Market Statistics	Germany Market Share Update	July 1995
	Market Statistics	Italy Market Share Update	July 1995
	Market Statistics	Rest of Europe Market Share Update	July 1995
	Market Statistics	UK Market Share Update	July 1995
	Market Statistics	Europe Overview Forecast Update	September 1995
	Market Statistics	France Forecast Update	September 1995
	Market Statistics	Germany Forecast Update	September 1995
	Market Statistics	Italy Forecast Update	September 1995
	Market Statistics	Rest of Europe Forecast Update	September 1995
	Market Statistics	UK Forecast Update	September 1995
	Market Trends Report	1995 European CAD/CAM/CAE/GIS Market Trends	November 1995
User and Distribution Studies	User Wants and Needs Report	European GIS User Survey	August 1995
Electronic Newsletters	Online Newsletter	QuickTakes	Weekly via Internet
	Fax Alert	DQ Alert	August 1995

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December 1994

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I look forward to working with you in our continuing process to improve the content, quality, and delivery of Dataquest's products and services. If you have questions about our research programs, publications delivery schedule, or on-going services, please call your analyst/account manager, or you may call me directly at (408) 437-8293.

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Global Market Insight for Information Technology Companies



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From semiconductors to systems, software to services, telecommunications to document management, Dataquest's scope of expertise provides clients with a clear view of the relationships between information technology segments – relationships that can have a profound impact on making strategic business decisions.

Computer Systems and Peripherals

Computer Systems
- Client/Server Computing *Worldwide*
- Advanced Desktop, Workstation, and Client/Server Distribution Channels
- Computer and Client/Server Systems *Europe*
- PC and Low-End Computer Servers *Europe*
- UNIX and Open Systems *Europe*
- Computer Systems *Japan*

Workstations
- Advanced Desktop and Workstation Computing *Worldwide*
- Advanced Desktop and Workstation Quarterly Statistics *Worldwide*
- Workstations *Europe*
- Workstation Quarterly Statistics *Europe*

Personal Computing
- Personal Computers *Worldwide*
- *European* PC Strategic Service
- *European* (PC) Market Update
- Personal Computers *Asia/Pacific*
- PCMCIA Systems and Peripherals *Worldwide*
- Mobile Computing *Worldwide*
- PC Quarterly Statistics *United States*
- *European* (PC) Quarterly Statistics
- PC Quarterly Statistics *Japan*
- PC Distribution Channels *Worldwide*
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- Network Distribution Channels *Europe-Upgrade*
- PC Distribution Channels Quarterly Statistics
- PC Tracking Services *Asia/Pacific*

Computer Storage
- Removable Storage *Worldwide*
- Optical Disk Drives *Worldwide*
- Optical Disk Drives *Europe*
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- Tape Drives *Worldwide*
- Tape Drives *Europe*

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Online, Multimedia, and Software

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- Online Strategies *Worldwide*

Business Productivity
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- Personal Computing Software *Worldwide*
- *European* Personal Computing Software
- *European* Personal Operating Systems
- Workgroup Computing *Worldwide*
- *European* Workgroup Computing

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- Electronic Design Automation *Worldwide*
- Mechanical CAD/CAM/CAE *Worldwide*
- CAD/CAM/CAE/GIS *Europe*
- CAD/CAM/CAE/GIS *Asia/Pacific*

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- *European* Customer Services

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  - Systems Integration and Applications Development
  - Consulting and Education
  - Systems Management
- Professional ServiceTrends: Vertical Market Opportunities *North America*
- *European* Professional Services

Sector Programs
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- *European* Desktop Support Services
- Network Integration and Support Services *North America*
- *European* Network Integration & Support Services
- Software Services *North America*
- Strategic Service Partnering *North America*

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1995 RESEARCH PROGRAMS

Document Management

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- Colour Products *Europe*

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- Copiers *Europe*

Facsimile
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Printers
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- Printers *Europe*
- **Printer Distribution Channels** *Europe*
- Printer Tracking Services *Asia/Pacific*

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- • Korea
- • Singapore

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- PC Teardown Analysis
- PC Watch *Europe*
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- • Digital WANs *North America*
- • Modems *North America*
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- • Asynchronous Transfer Mode (ATM) *Europe*
- • ISDN *Europe*
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- • Private Digital WAN *Europe*
- Networking Market Watch – Intelligent Hubs
- Network Distribution Channels *Europe*

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- • Integrated Calls Centers *North America*
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- • Telephones *Europe*
- • PBX/KTS Systems *Europe*

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Dataquest Catalyst Programs

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- Financial Service Providers
- Government Agencies
- IT Business Strategy and Planning Organizations
- Publishing, Media, and Consulting Firms
- IS and Purchasing Organizations
- IT Supporting Organizations

Emerging Markets

Central and Eastern European Markets
- Printers
- Personal Computers

Information Technology Market Opportunities
- China
- Asia/Pacific
- Latin America

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Global Market Insight for Information Technology Companies



CAD/CAM/CAE/GIS EUROPE

Dataquest's CAD/CAM/CAE/GIS Europe program provides the country-by-country data and analysis required to penetrate the markets of Europe effectively, coupled with in-depth reviews of the government, trade, and economic forces that shape the European marketplace. CAD/CAM/CAE/GIS Europe is an invaluable tool to assist strategic planners and tactical product managers to capitalize on opportunities in the European community.

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As a client, you have direct access to experienced analysts who can provide insights and advice on market dynamics, industry events, and competitive issues.

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Dataquest provides detailed European country-level software shipments, market share, revenue, and market forecasts, as follows:

Major Data Points

- Total factory, hardware, and software revenue
- Service revenue
- Computer shipments
- Distribution channels

Applications

- Mechanical
- AEC
- GIS/mapping
- Electronic CAE
- IC layout
- PCB/MCM/hybrid

Platforms

- Personal computer
- Technical workstation
- Host-based

Regions Covered

- Benelux
- Central and Eastern Europe
- France
- Germany
- Italy
- Scandinavia
- Spain
- United Kingdom
- Total European Market

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Worldwide Online, Multimedia, and Software Group

WHAT YOU WILL RECEIVE AS A CLIENT

CAD/CAM/CAE/GIS EUROPE



Market Analysis

European CAD/CAM/CAE/GIS Market Trends: This report includes detailed analysis of the forces driving the European CAD/CAM/CAE/GIS market. Trends and issues, changing end-user requirements, regional differences, and computer industry technology changes are discussed in relation to their impact on European CAD market dynamics. The study presents country-level analysis of CAD/CAM/CAE/GIS markets in Germany, France, Italy, Spain, and the United Kingdom, as well as a total Europe recap.

Available in the fourth quarter of 1995

European CAD/CAM/CAE/GIS Market Statistics: This series of reports provides the most reliable and comprehensive set of market data on European CAD/CAM/CAE/GIS markets, including hardware, software, and service forecasts and market share for European CAD/CAM/CAE/GIS companies and applications. A total of four reports are published each year. Two reports presenting market share and forecasts are published during the first half of the year; these are updated during the second half of the year.



Perspective

Timely newsletters presenting analysis and commentary on key events/issues in the European CAD software market. These documents are published on an event-driven basis throughout the year and include:

- **Dataquest Predicts**—Forward-looking analysis of European CAD/CAM/CAE/GIS software market dynamics that include Dataquest's predictions about future industry and technology directions
- **End-User Analysis**—A series of newsletters issued at regular intervals throughout the year that provide analysis of end-user statistics gathered through Dataquest surveys and detailed analysis of European CAD/CAM/CAE/GIS market data on a country-by-country basis
- **Research Briefs**—Analysis of industry news, mergers, announcements, and shows

QuickTakes

QuickTakes provides weekly summaries of the top news in the software, multimedia, and online information industries, accompanied by the "Dataquest Take." These documents are delivered electronically every Monday morning to European CAD/CAM/CAE/GIS service clients at any e-mail box accessible via the Internet (including AppleLink, cc:Mail, CompuServe, IBM Mail, MCI Mail, AT&T Mail, and so on).

Weekly delivery via the Internet

Dataquest Alerts

News and commentary on late-breaking European CAD/CAM/CAE/GIS industry events delivered by fax and/or email.

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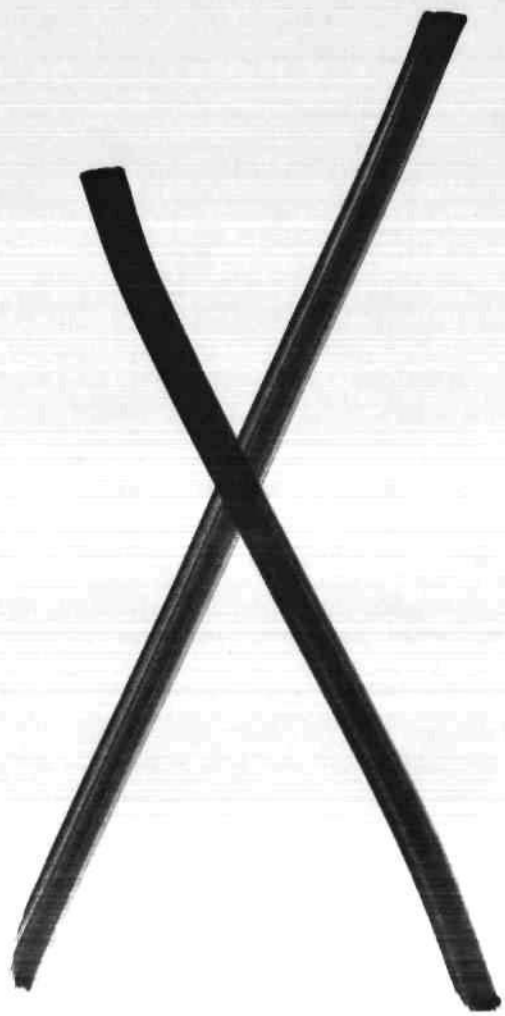
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Perspective



CAD/CAM/CAE/GIS Europe

Dataquest Predicts

European CAD/CAM/CAE and GIS Forecast Update

Abstract: *The outlook for the European markets is brighter than it has been for the last several years. The European economy as a whole continues to emerge slowly from its recession, and many of the European industries have begun a major restructuring of their IT investments. Dataquest expects the growth of the European CAD/CAM/CAE/GIS market to pick up momentum in 1995 with 12 percent in total revenue and 19 percent in software revenue. Until 1999, we anticipate a CAGR of 10 percent for total CAD/CAM/CAE/GIS revenue and a 12 percent CAGR for software revenue.*
By Petra Gartzen

The Continuing Impact of Currency Shift

Currency fluctuations will continue to be felt in all global markets. The dollar has continued to weaken during the early months of 1995, so if we were to assume a stable currency for the remainder of the year, 1995 will end with the dollar depreciating 7.8 percent against the European Currency Unit (ECU). Although Dataquest does not forecast currency exchange rates, we do forecast with the best information available. The exchange rate is calculated as the simple arithmetic mean of the 12 average monthly rates for each country. For the purpose of this forecast, Dataquest assumed the September exchange rate will remain stable in the future.

European CAD/CAM/CAE/GIS Outlook

The broadening and strengthening of recovery in the European economies marks the end of the long and unusually severe downturn in recent years. Much of the improvement comes in a sharp upward revision in growth projections for Europe; the largest economies of Germany, France, and the

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Program: CAD/CAM/CAE/GIS Europe
Product Code: CCAM-EU-PD-9502
Publication Date: December 25, 1995
Filing: Perspective
(For Cross-Industry, file in the Online, Multimedia, and Software binder behind the **CAD/CAM/CAE/GIS Europe** name)

United Kingdom stand at the forefront of the recovery. As the European economy continues to emerge slowly from its recession, many of the European industries have begun a major restructuring of their information technology (IT) investments. Dataquest expects the return to growth of the European CAD/CAM/CAE/GIS market to pick up momentum in 1995 with 12 percent in total revenue and 19 percent in software revenue (when looking at the 1995 U.S. dollar numbers for Europe, the currency fluctuation discussed previously has to be taken into account). Until 1999, we anticipate a compound annual growth rate (CAGR) of 10 percent for total CAD/CAM/CAE/GIS revenue and a 12 percent CAGR for software revenue.

Germany, the biggest consumer nation of CAD/CAM/CAE/GIS technology, started to show improved growth in 1994. This growth should accelerate over the next two years, particularly in the manufacturing industry. France and the United Kingdom are almost equal in terms of market size, and again we are seeing renewed investment in all four application segments. The Italian market is the one market where the economy is still not faring well; however, we are seeing high growth rates with PC-based solutions. This is because the introduction of very strict software copyright laws. It is said that in Italy, it is not the vendors selling CAD/CAM/CAE/GIS software but the carabinieri (the Italian police force). This growth trend will continue also in 1995. After 1995, we expect the Italian economy to improve and growth will happen because of natural causes.

Desktop Dominance

The turf war for desktop dominance is building steam with the introduction of the Pentium chip and Windows NT, which will fight to take market share from the higher-priced, multiple UNIX operating systems with RISC technology. The decline of host-dependent systems is also continuing, with replacements going to networked desktop systems. Vendors whose business models depend on high-priced workstations are threatened by these powerful new PCs. At the same time, the replacement of host systems provides them with opportunity for growth.

Figures 1 to 4 provide a picture of the European CAD/CAM/CAE/GIS market from various angles.

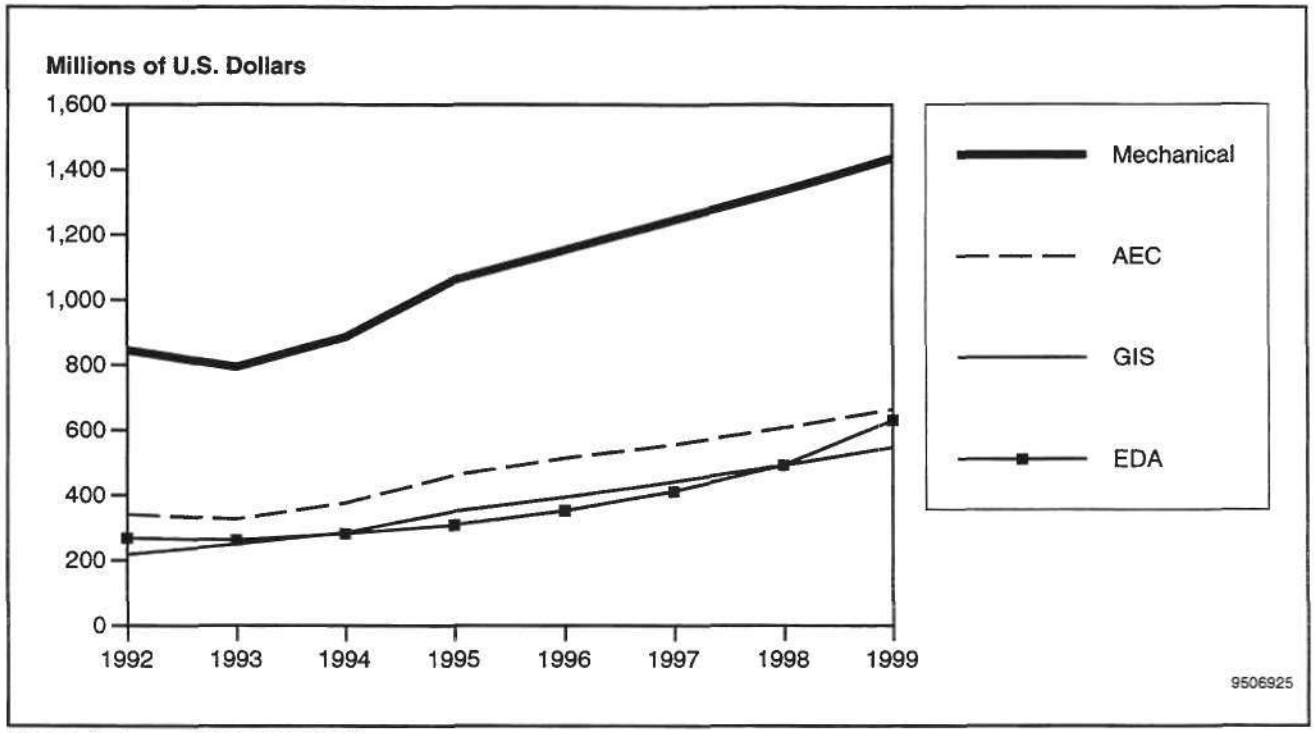
Mechanical

The recovery of the European manufacturing industry that began in 1994 gathered momentum in 1995. This trend should continue in 1996. In 1995, we expect mechanical software revenue to increase 20 percent in terms of dollar revenue (12 percent based on ECU). The CAGR for mechanical CAD/CAM/CAE software revenue until 1999 is expected to be about 10 percent. In terms of revenue, this market remains predominantly UNIX-based. In terms of units, PC-based solutions will continue to play the dominant role.

Figures 5 to 8 offer a snapshot of Dataquest's predictions for the mechanical CAD/CAM/CAE/GIS market by component, major European country, and platform.

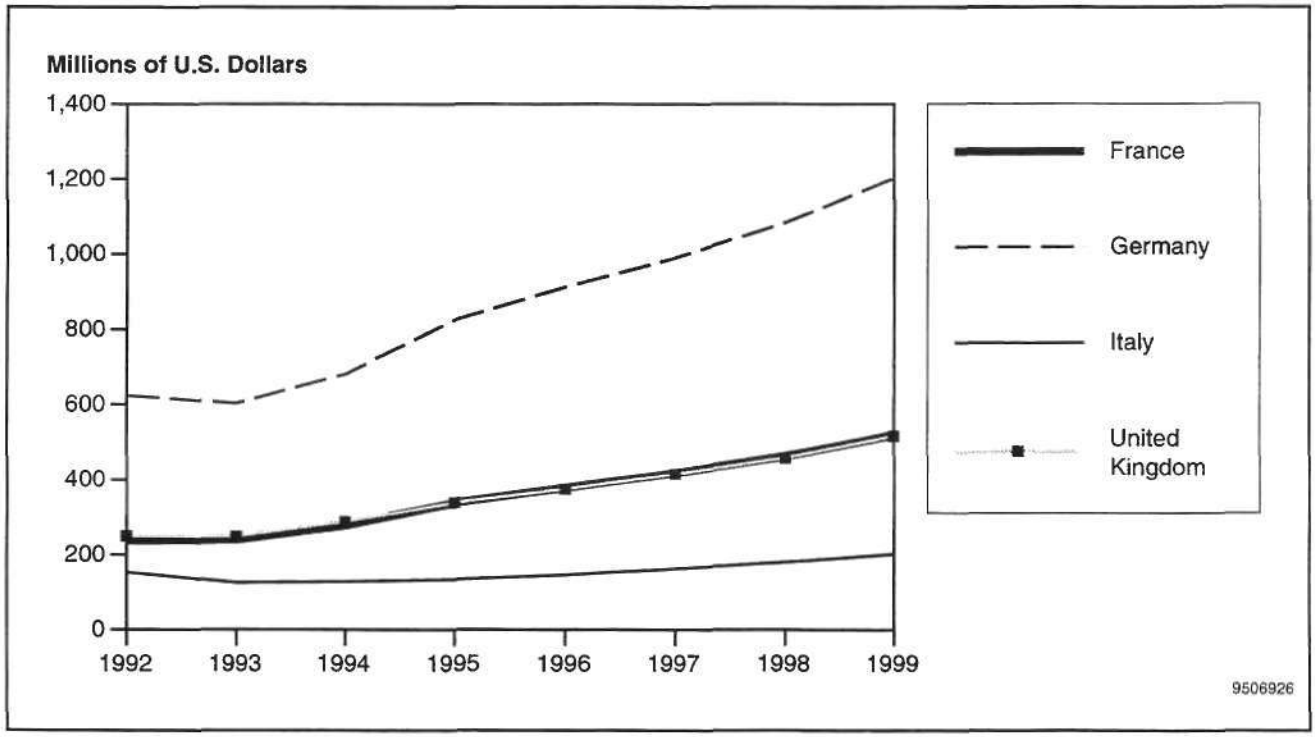
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Figure 1
European CAD/CAM/CAE/GIS Software Revenue Forecast by Application (Millions of U.S. Dollars)



Source: Dataquest (December 1995)

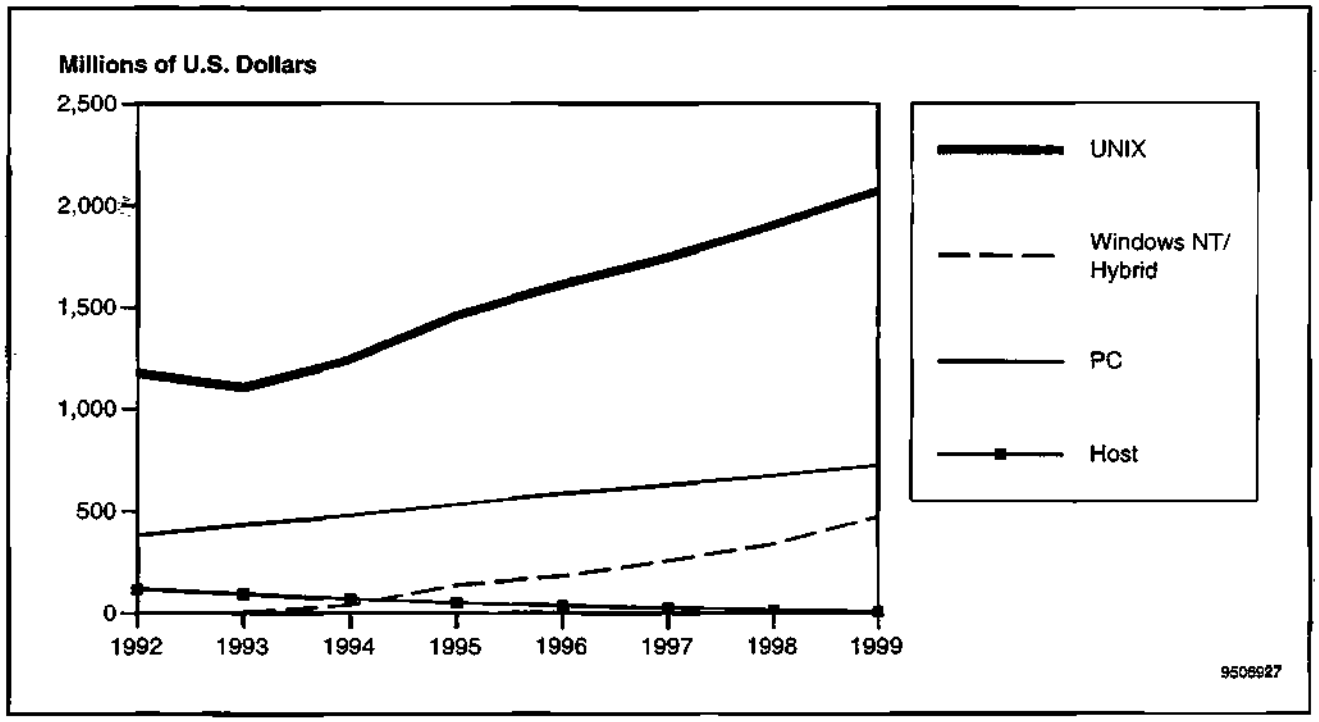
Figure 2
European CAD/CAM/CAE/GIS Software Revenue Forecast by Country (Millions of U.S. Dollars)



Source: Dataquest (December 1995)

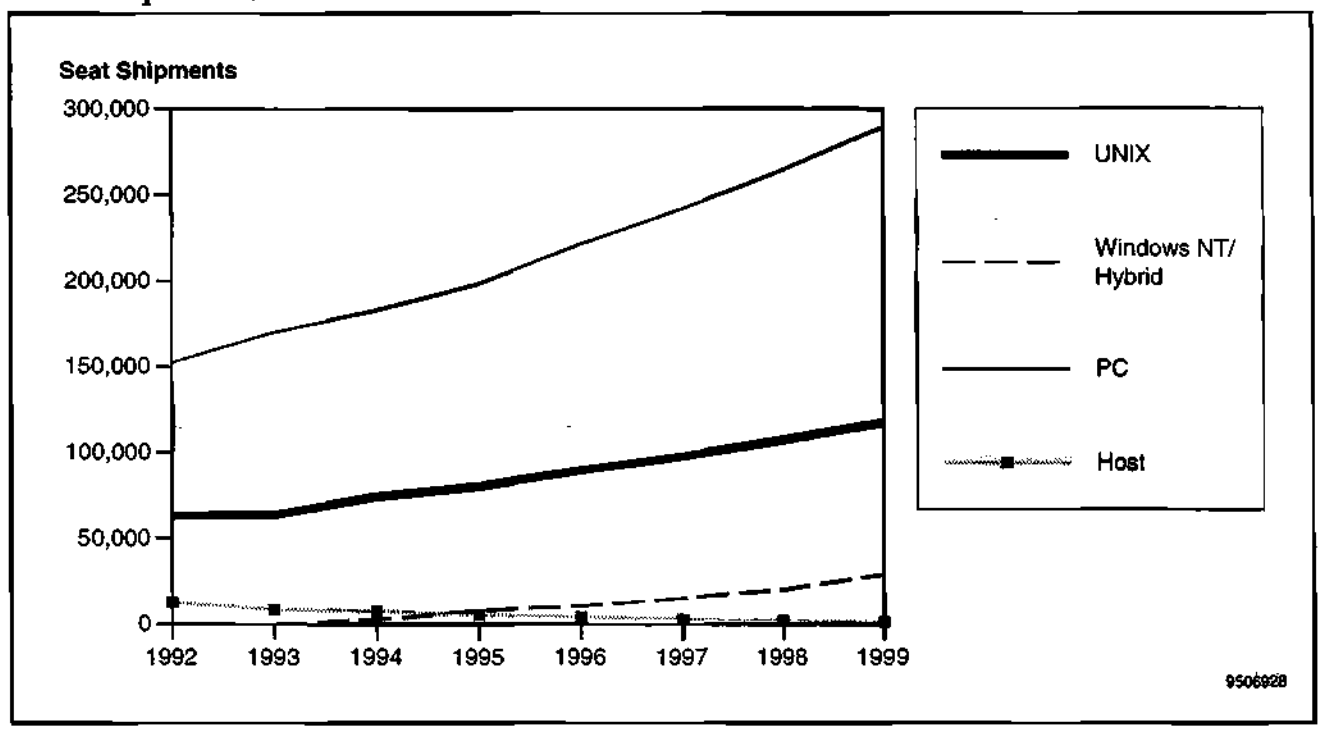
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Figure 3
European CAD/CAM/CAE/GIS Software Revenue Forecast by Platform (Millions of U.S. Dollars)



Source: Dataquest (December 1995)

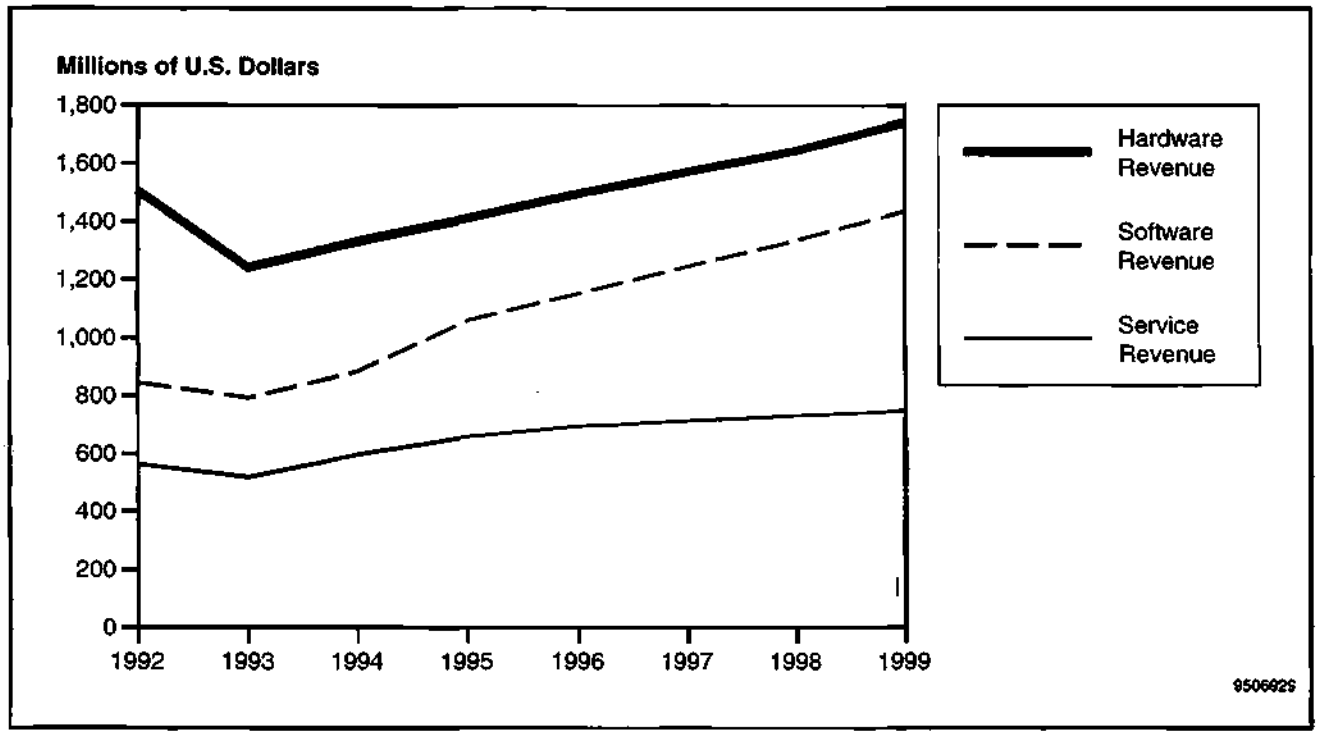
Figure 4
European CAD/CAM/CAE/GIS Hardware Seat Shipment Forecast by Platform (Seat Shipments)



Source: Dataquest (December 1995)

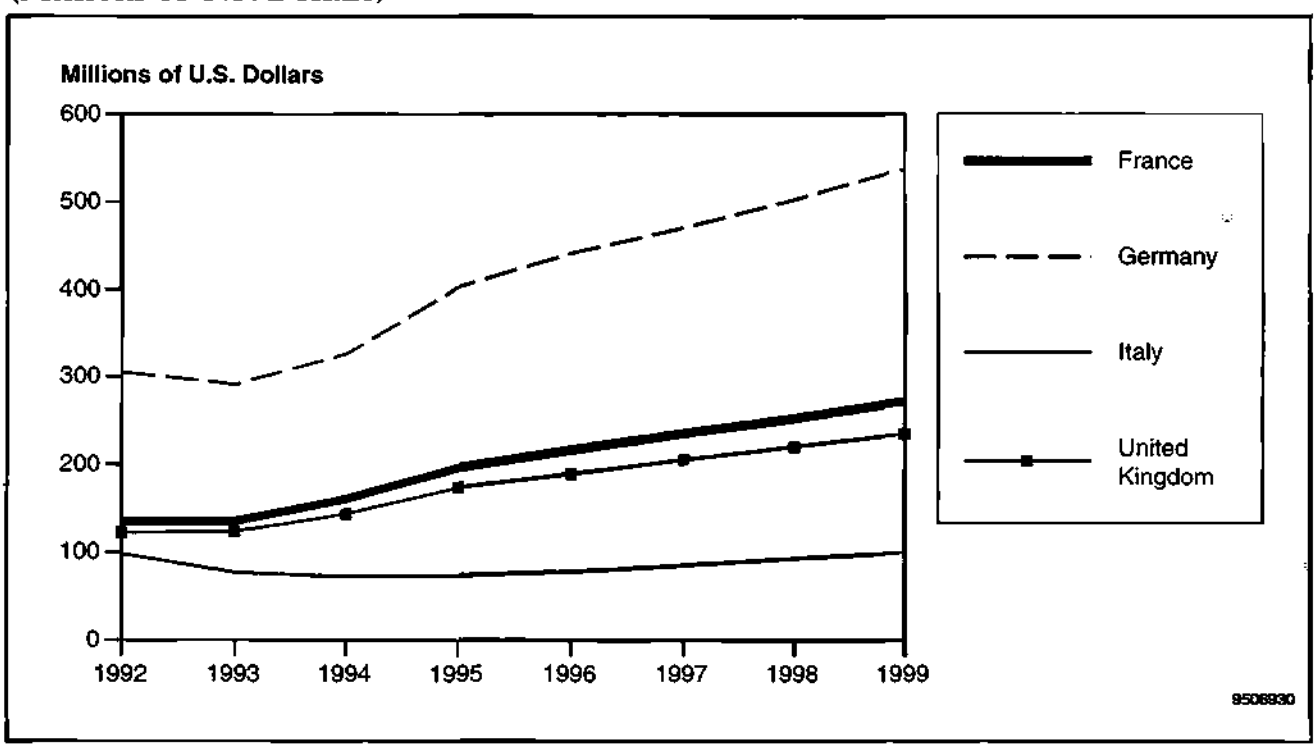
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Figure 5
European Mechanical CAD/CAM/CAE/GIS Revenue Forecast by Component (Millions of U.S. Dollars)



Source: Dataquest (December 1995)

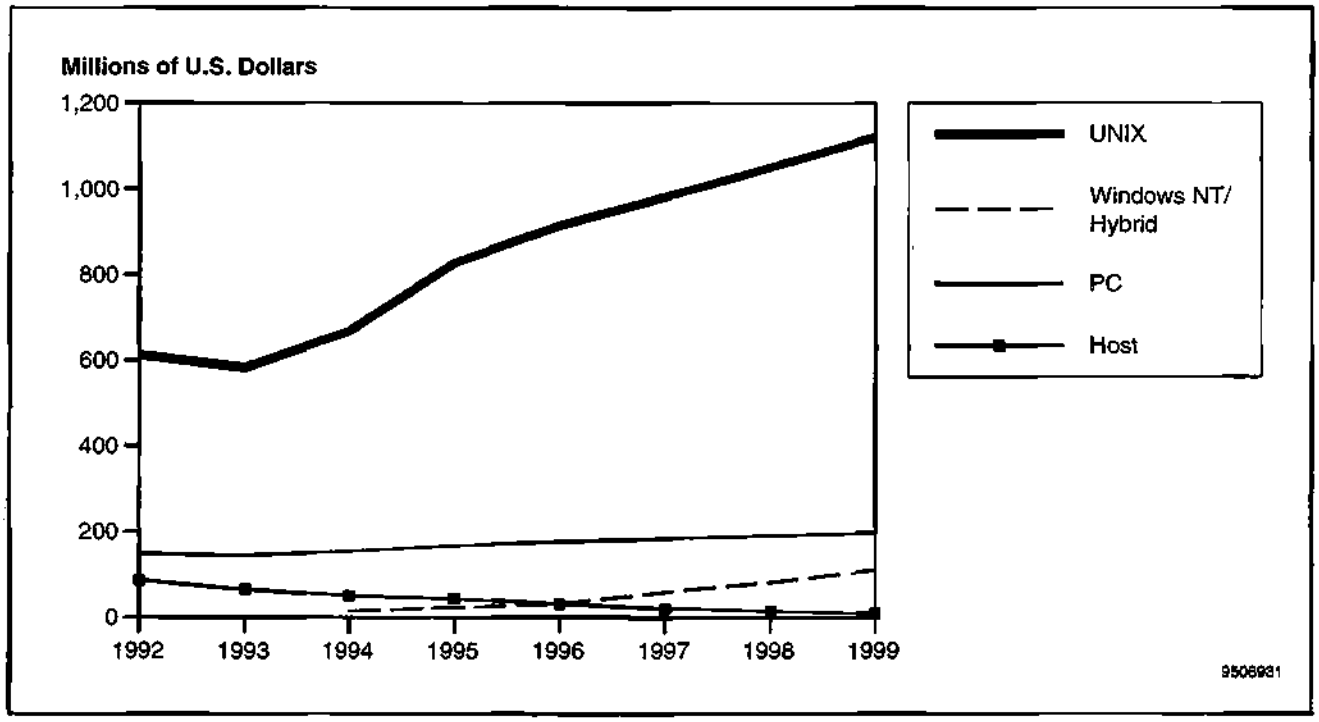
Figure 6
European Mechanical CAD/CAM/CAE/GIS Software Revenue Forecast by Country (Millions of U.S. Dollars)



Source: Dataquest (December 1995)

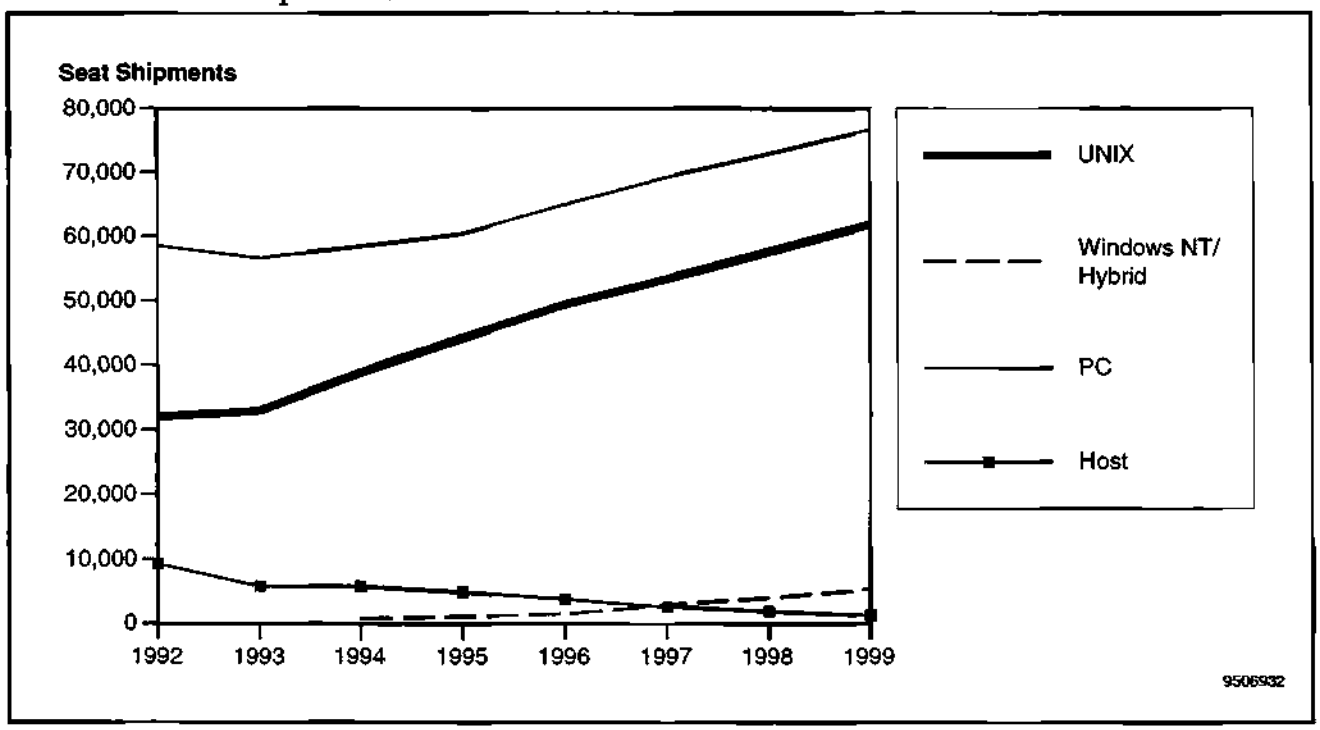
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Figure 7
European Mechanical CAD/CAM/CAE/GIS Software Revenue Forecast by Platform (Millions of U.S. Dollars)



Source: Dataquest (December 1995)

Figure 8
European Mechanical CAD/CAM/CAE/GIS Hardware Seat Shipment Forecast by Platform (Seat Shipments)



Source: Dataquest (December 1995)

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AEC

As most European economies emerge from the recession, Dataquest expects growth for AEC software to continue. Until 1999, we expect a CAGR of 12 percent in software revenue.

The largest regional market for AEC software is Germany, which absolutely dominates with a 47 percent share of total European AEC software revenue. The German market is still driven by the construction boom following reunification. However, this boom is expected to end next year. At the same time, AEC market growth in the other European regions should improve.

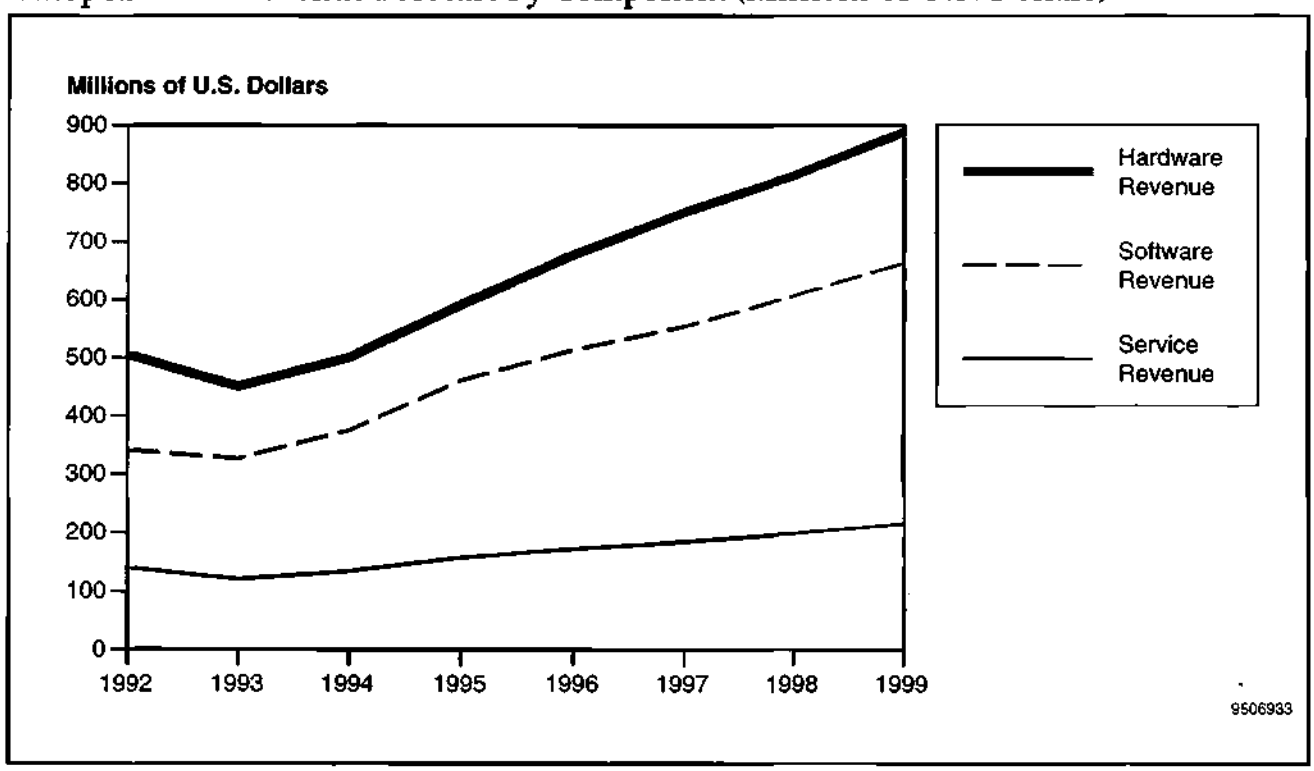
The AEC market segment is dominated by PC-based solutions, not only in terms of unit shipments, but also in terms of software revenue.

Figures 9 to 12 offer a snapshot of Dataquest's predictions for the AEC market by component, major European country, and platform.

GIS

There is a tendency in Europe to make the public sector smaller. In countries where, for example, the utility sector was privatized, we have seen a surge in GIS spending almost as a direct result. Also, the telecommunications sector is becoming increasingly deregulated, and in order for telecommunications companies to have a competitive edge, they have had to become more efficient in managing territories.

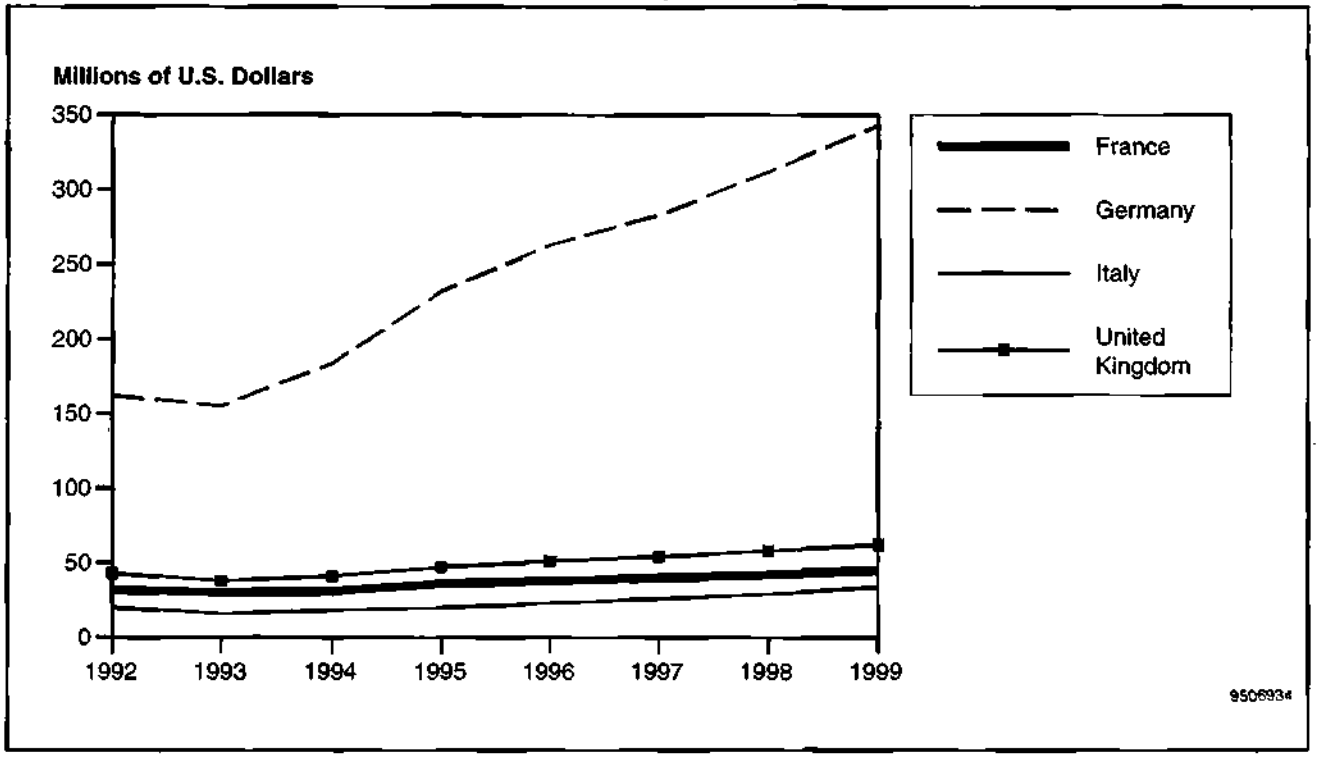
Figure 9
European AEC Revenue Forecast by Component (Millions of U.S. Dollars)



Source: Dataquest (December 1995)

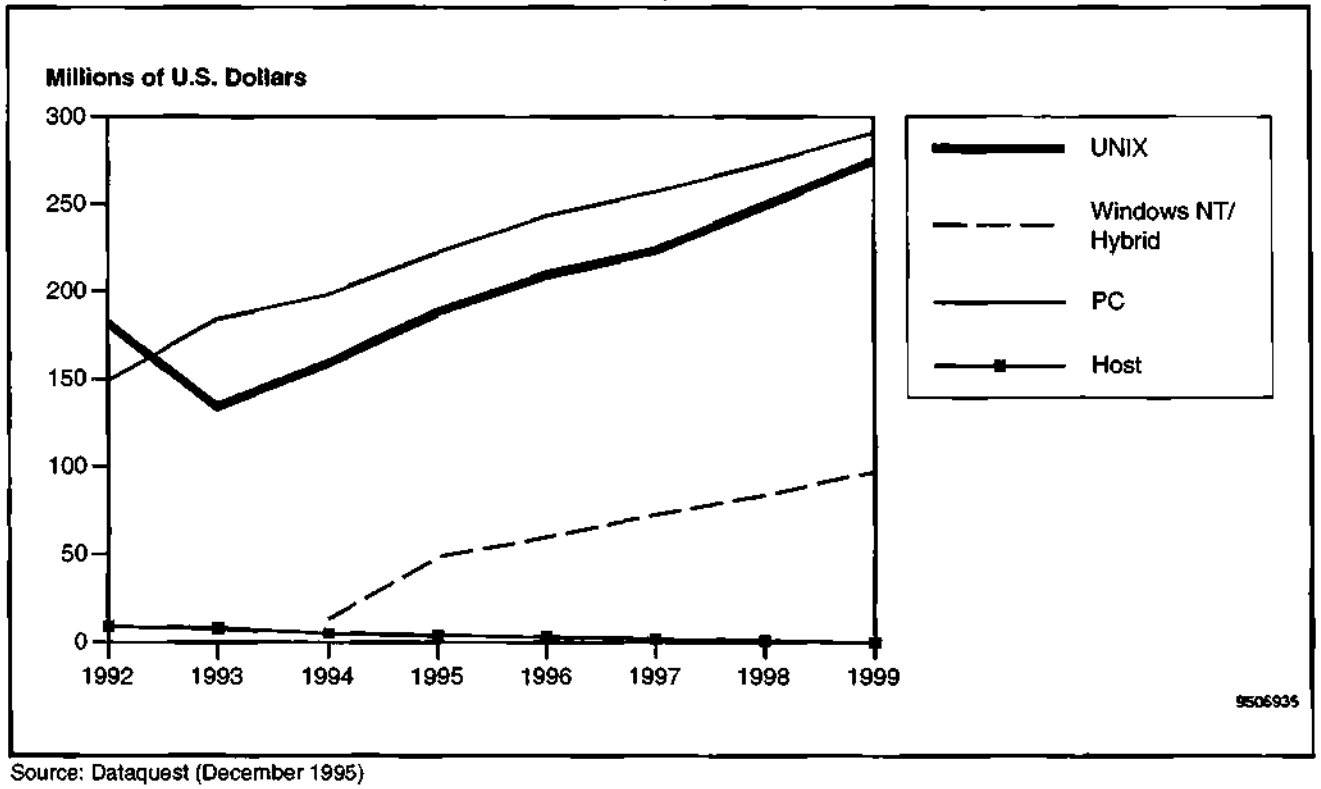
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Figure 10
European AEC Software Revenue Forecast by Country (Millions of U.S. Dollars)



Source: Dataquest (December 1995)

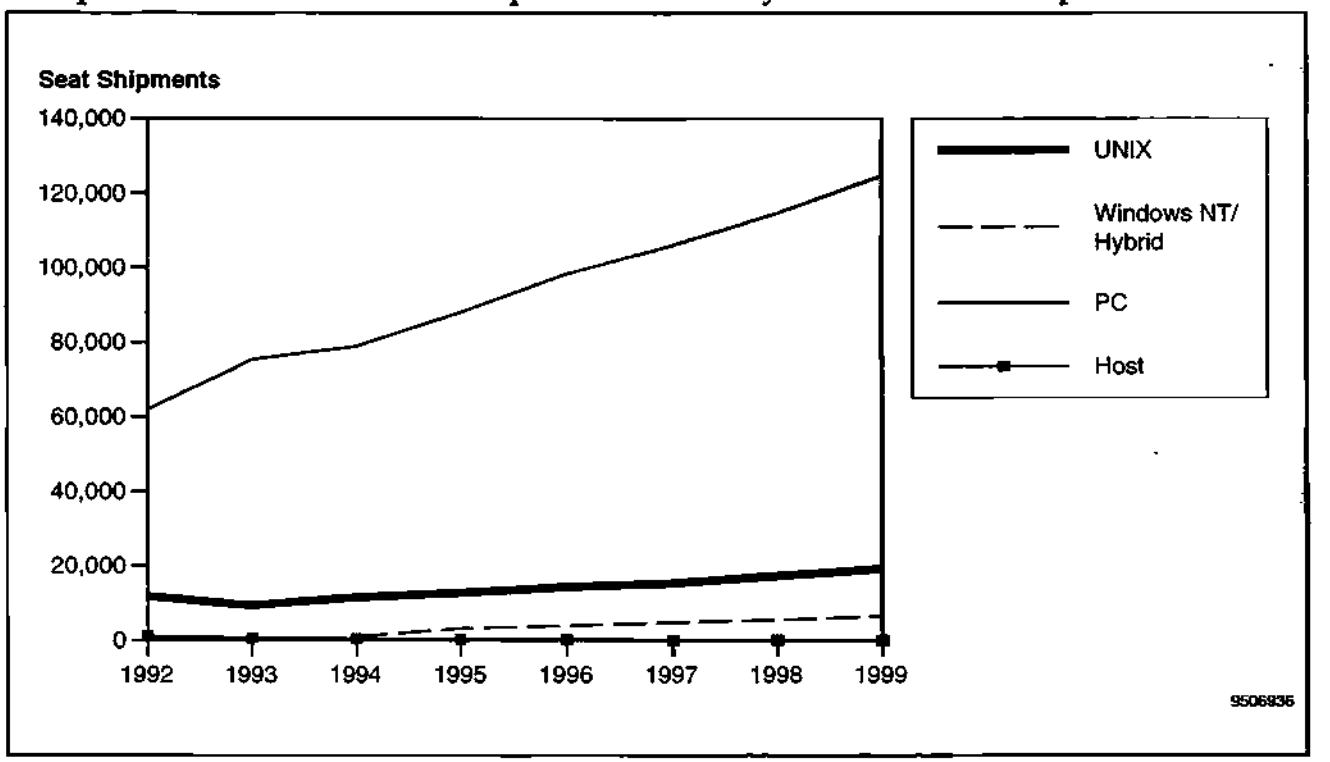
Figure 11
European AEC Software Revenue Forecast by Platform (Millions of U.S. Dollars)



Source: Dataquest (December 1995)

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Figure 12
European AEC Hardware Seat Shipment Forecast by Platform (Seat Shipments)



Source: Dataquest (December 1995)

In terms of software revenue, the European GIS market is very much dominated by technical workstation-based solutions. PC-based and Windows NT-based solutions are constantly gaining ground, and host-based solutions will likely become extinct. In terms of actual GIS seats, PC-based solutions will dominate this sector.

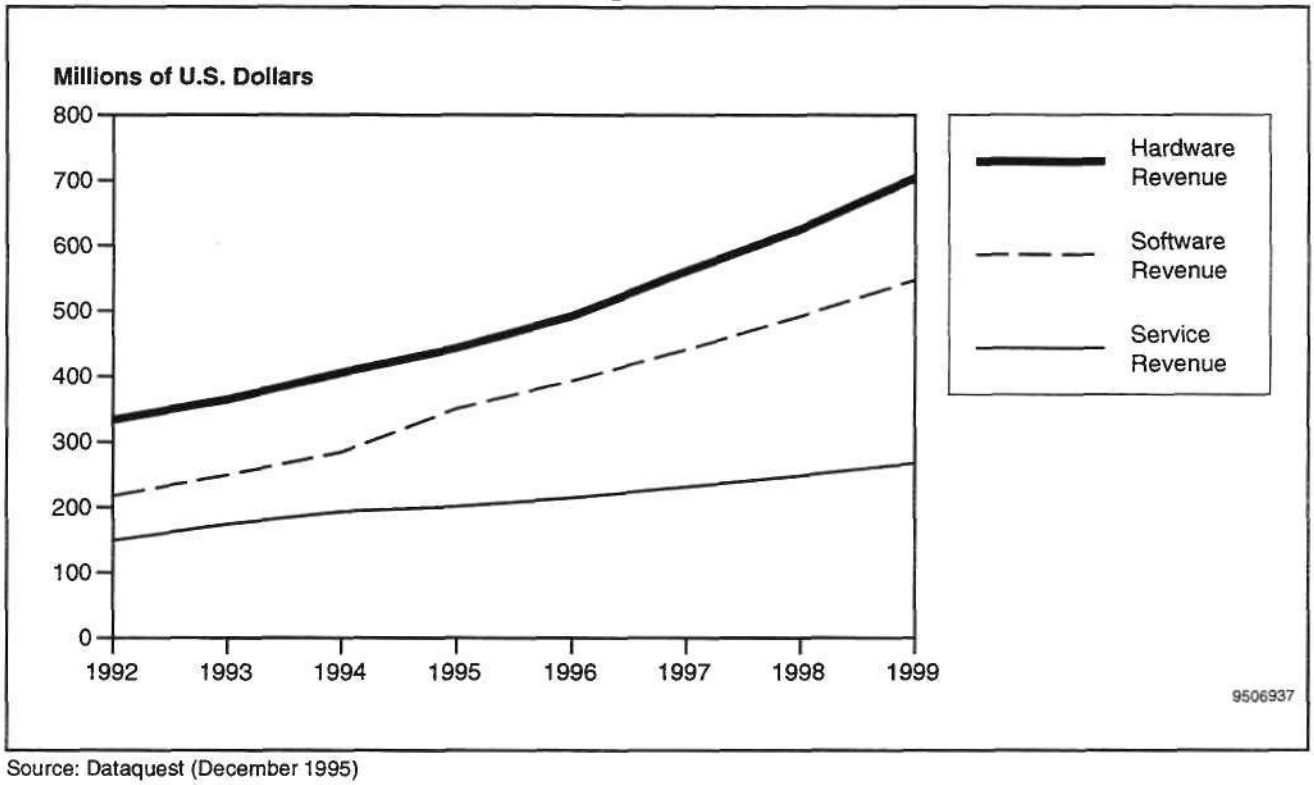
In 1995, the European GIS software market is expected to increase 23 percent in terms of dollar revenue and about 15 percent based on ECU. The CAGR until 1999 is expected to be approximately 14 percent.

The European end-user market is fragmented and differs by country depending on the level of government privatization and the structuring of various sectors. In several countries (Belgium for example), the public authority is responsible for roads and wastewater but not for utilities such as gas, electricity, and drinking water. Because there is usually no coordination between the public authority and the utility sector in countries where these sectors are independent of each other, it is impossible to create a single good database. In most cases, these two sectors do not share costs for political reasons.

Figures 13 to 16 offer a snapshot of Dataquest's predictions for the GIS market by component, major European country, and platform.

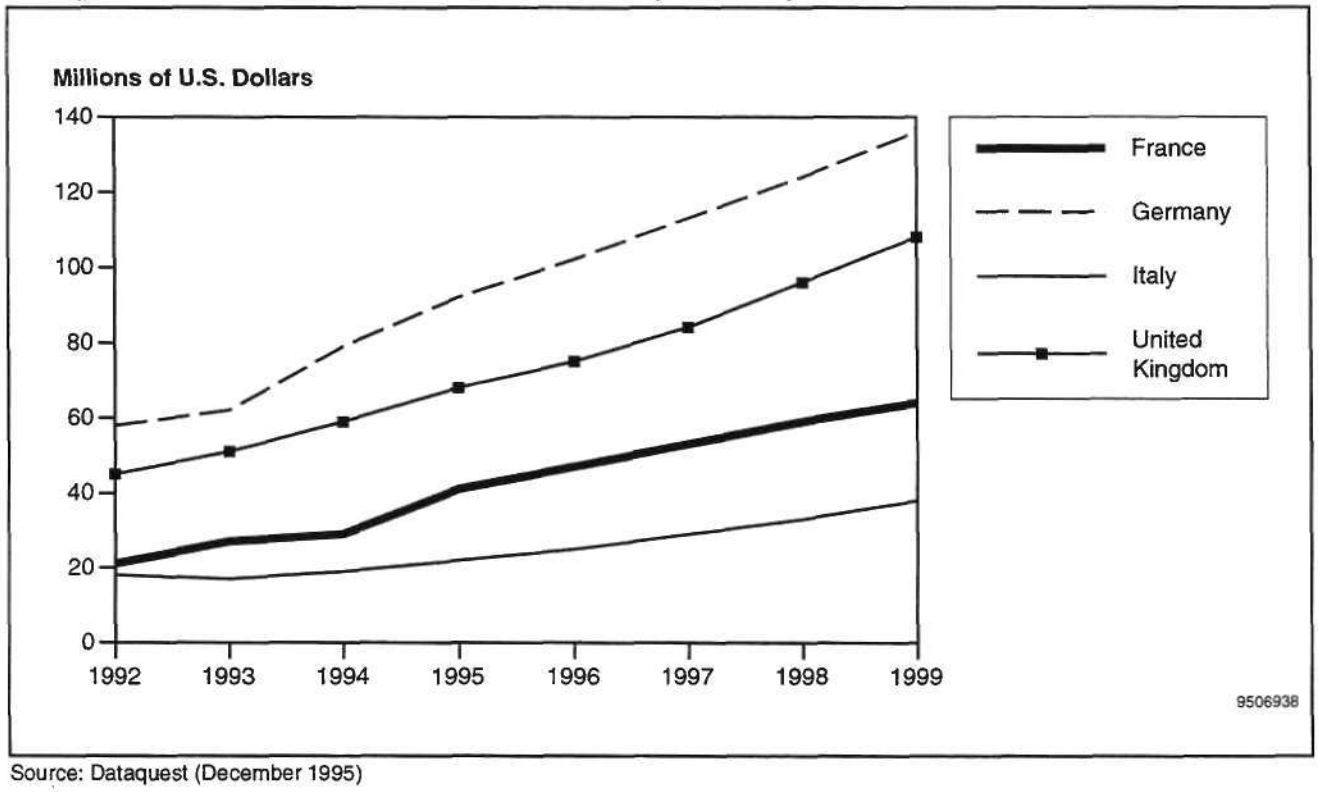
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Figure 13
European GIS Revenue Forecast by Component (Millions of U.S. Dollars)



Source: Dataquest (December 1995)

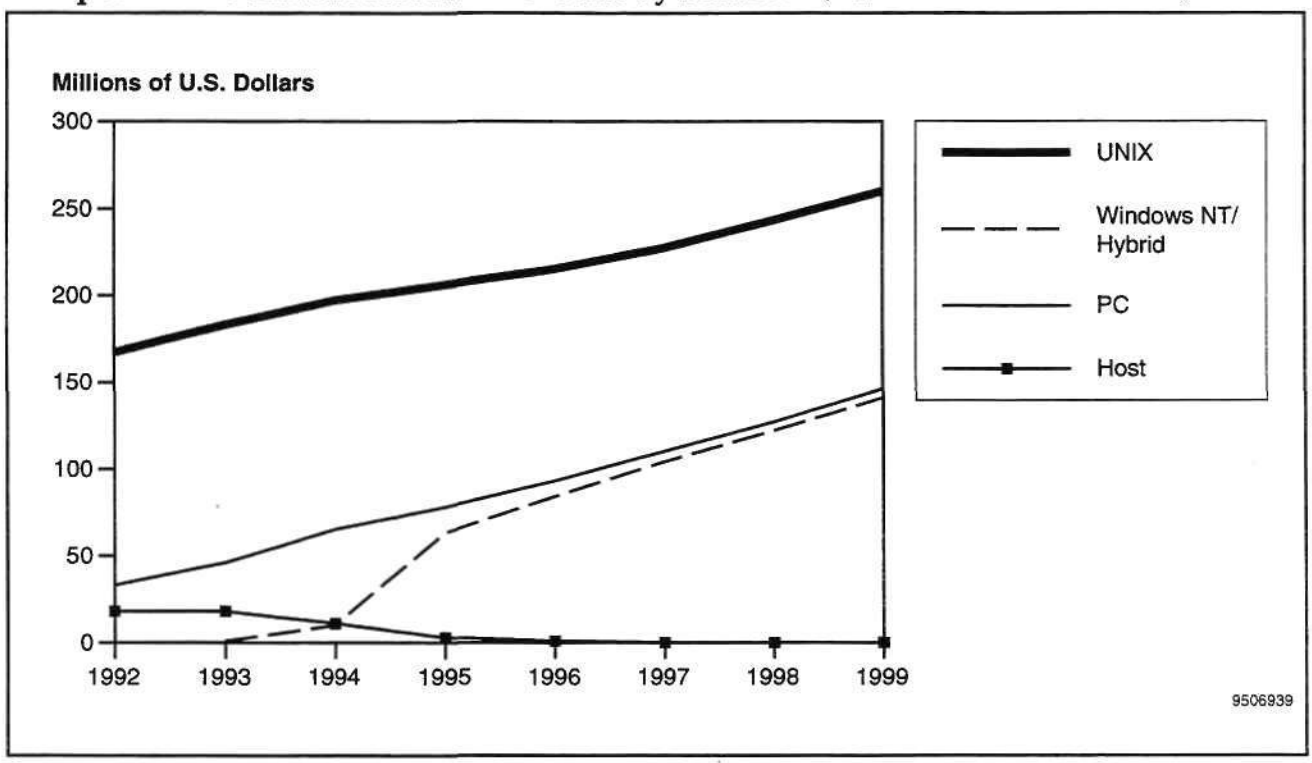
Figure 14
European GIS Software Revenue Forecast by Country (Millions of U.S. Dollars)



Source: Dataquest (December 1995)

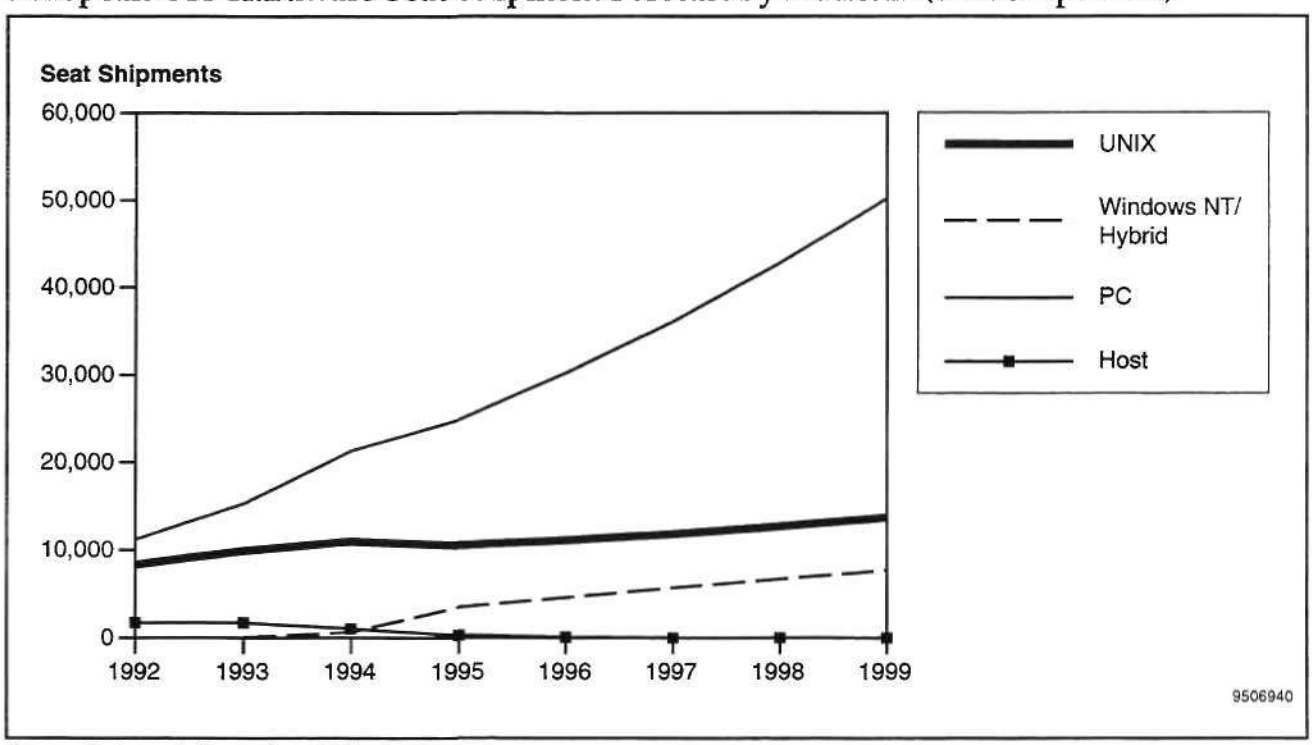
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Figure 15
European GIS Software Revenue Forecast by Platform (Millions of U.S. Dollars)



Source: Dataquest (December 1995)

Figure 16
European GIS Hardware Seat Shipment Forecast by Platform (Seat Shipments)



Source: Dataquest (December 1995)

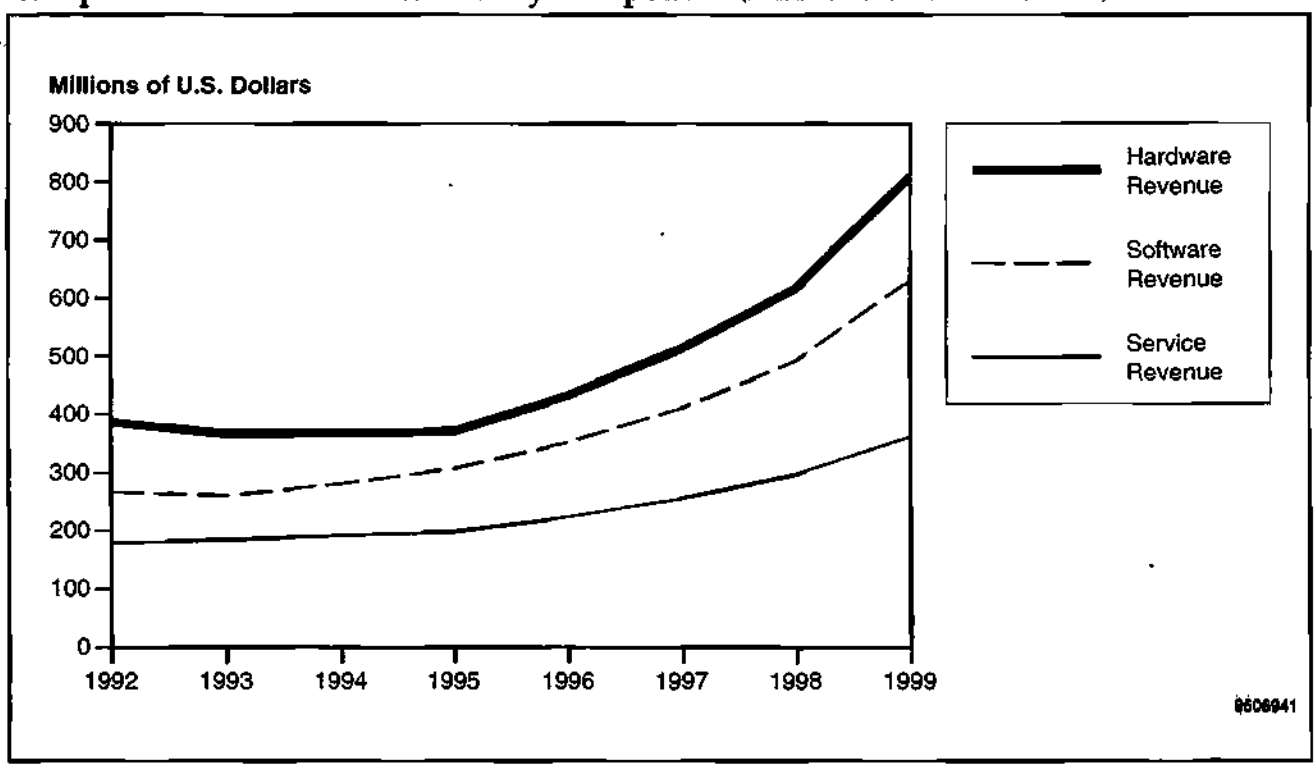
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EDA

Based on an overall improvement in the European economy and the fact that many user companies that deferred investments during the recession years are going to replace outdated systems, we anticipate the European EDA software market will increase 9 percent in 1995, and growth will accelerate starting in 1996. Growth is fueled by the continual increase of design complexity and ever-higher speeds. This sector is absolutely dominated by UNIX-based tools, however, toward the end of our forecast cycle in 1999 we should see a shift toward the Windows NT platform.

Figures 17 to 20 offer a snapshot of Dataquest's predictions for the European EDA software revenue forecast by component, region, and platform.

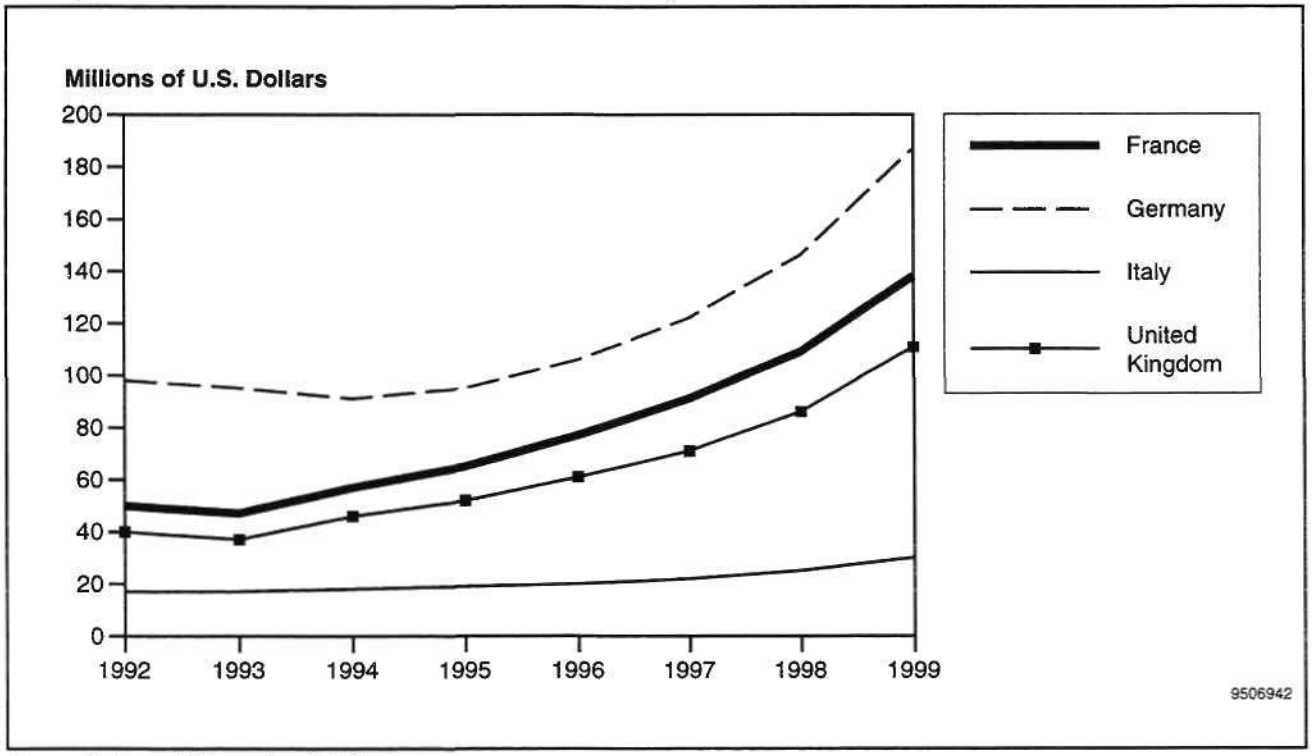
Figure 17
European EDA Revenue Forecast by Component (Millions of U.S. Dollars)



Source: Dataquest (December 1995)

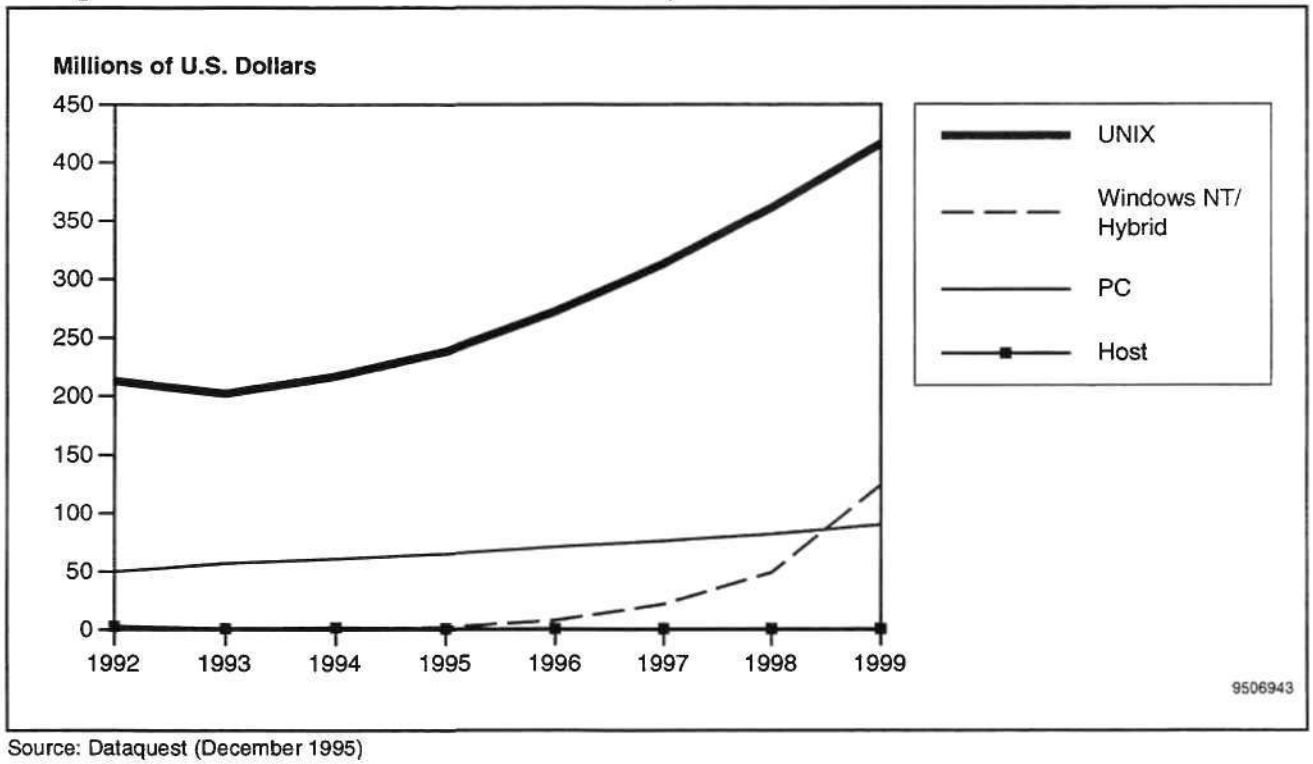
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Figure 18
European EDA Software Revenue Forecast by Country (Millions of U.S. Dollars)



Source: Dataquest (December 1995)

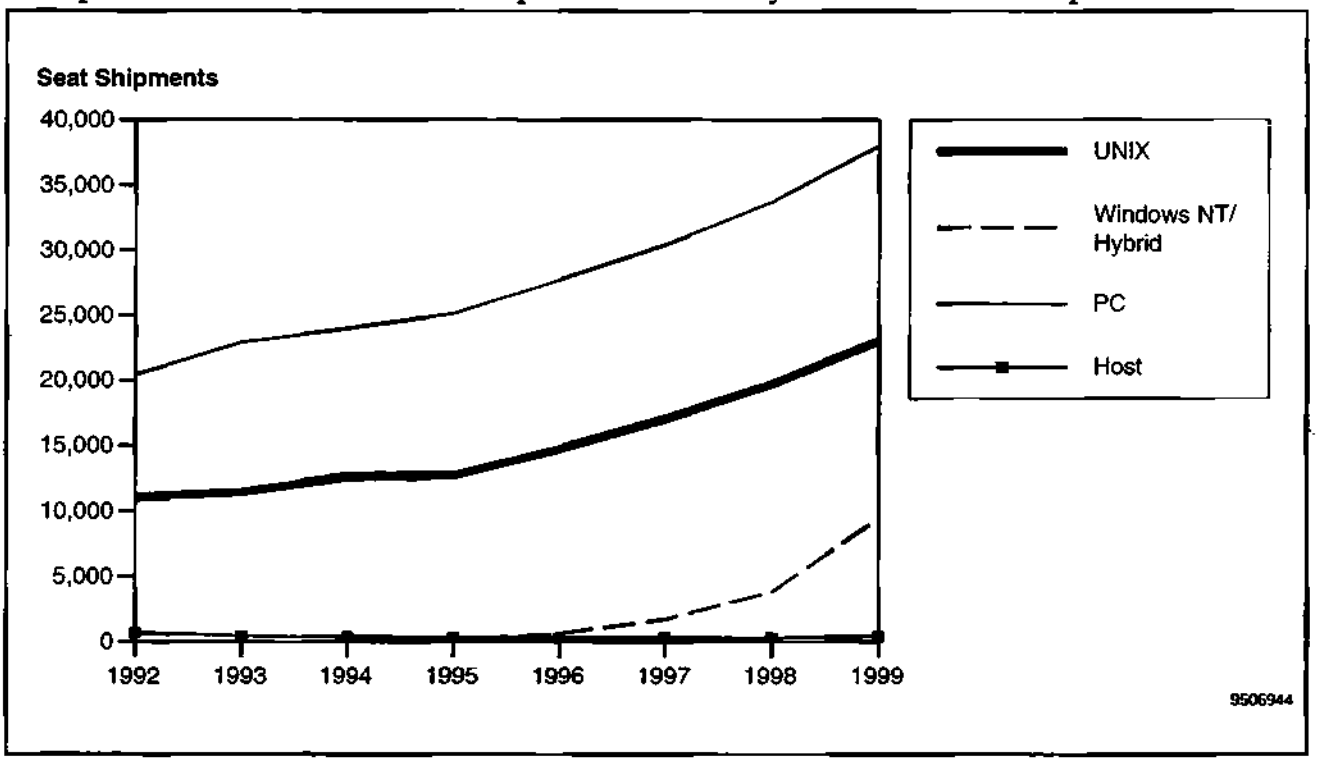
Figure 19
European EDA Software Revenue Forecast by Platform (Millions of U.S. Dollars)



Source: Dataquest (December 1995)

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Figure 20
European EDA Hardware Seat Shipment Forecast by Platform (Seat Shipments)



Source: Dataquest (December 1995)

For More Information...
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Internet address ..... pgartzen@dataquest.com
Via fax 44-1494-422742

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Perspective



CAD/CAM/CAE/GIS Europe

Dataquest Predicts

Europe is on the Move Again

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Looking ahead, currency fluctuations will continue to be felt. The dollar has continued to weaken during early months of this year, so if we were to assume a stable currency for the remainder of the year, 1995 will end with the dollar depreciating a further 9 percent against the ECU. Although Dataquest does not forecast currency exchange rates, we do forecast with the best information available. The exchange rate is calculated as the simple arithmetic mean of the 12 average monthly rates for each country. For the purpose of this forecast, Dataquest assumes that the April exchange rate will remain stable in the future.

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The broadening and strengthening of recovery in the European economies mark the end of the long and unusually severe downturn of recent years. Much of the improvement comes in a sharp upward revision in growth

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Product Code: CCAM-EU-PD-9501
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EDA	272	275	285	313	343	391	451	528	638	9.9	9.5	15.3
All Applications	1,577	1,670	1,634	1,776	2,026	2,231	2,442	2,694	3,003	8.7	14.0	11.1
Exchange Rate, ECU/U.S.$	0.8079	0.7686	0.8566	0.8436	0.7709	0.7629	0.7629	0.7629	0.7629	-1.5	-8.6	-2.0
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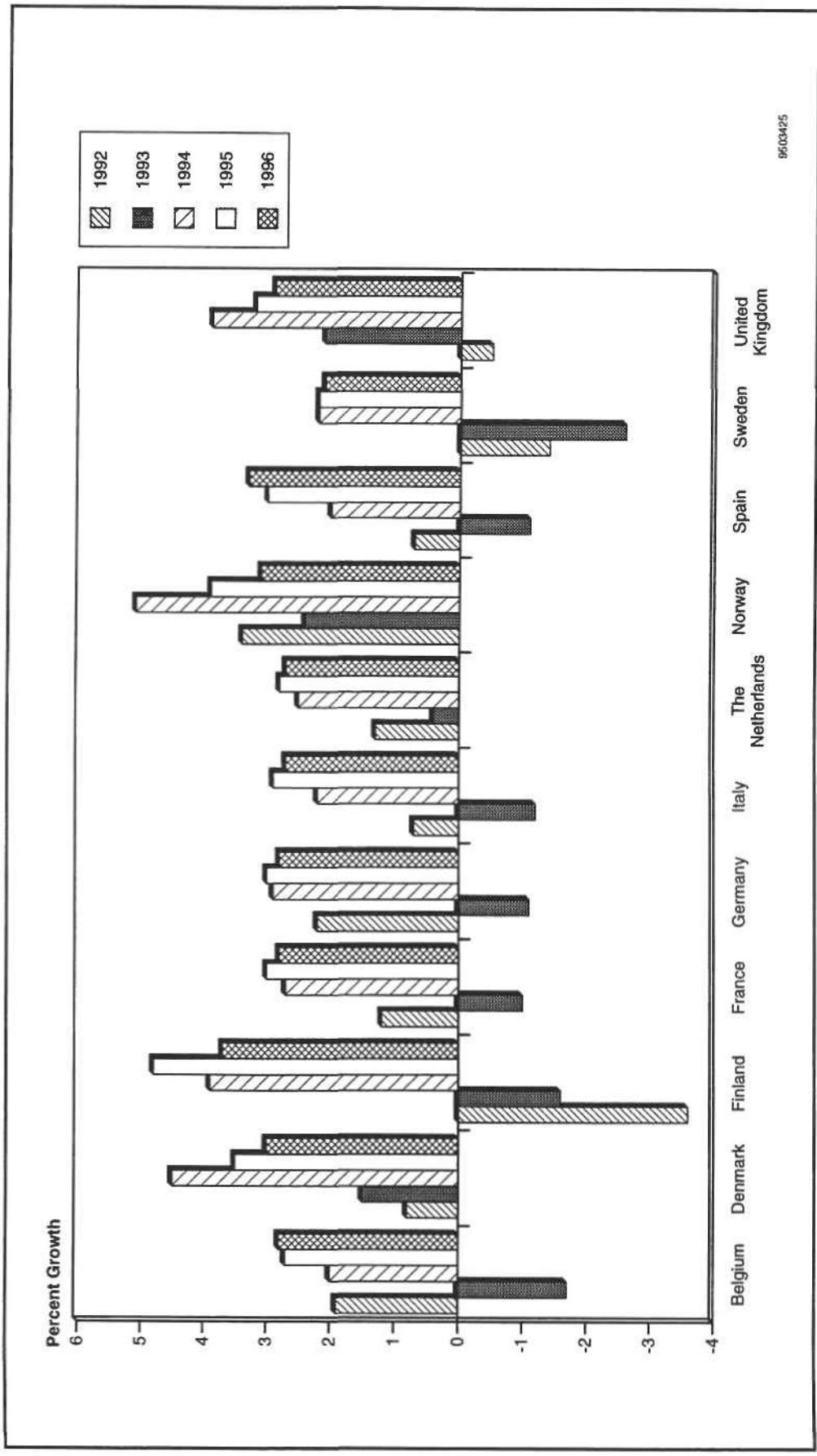
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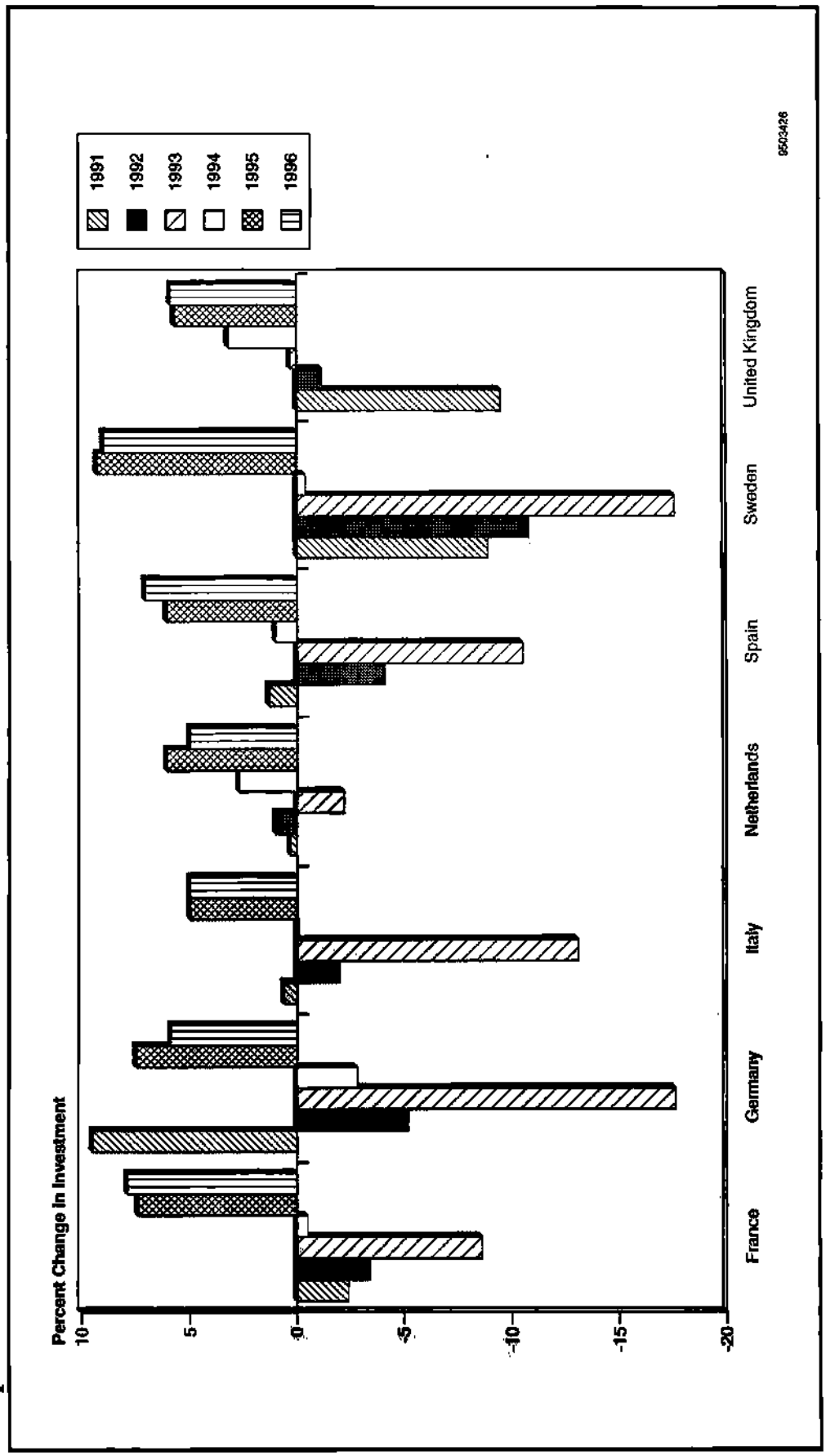
Figure 1
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Source: Consensus Forecasts

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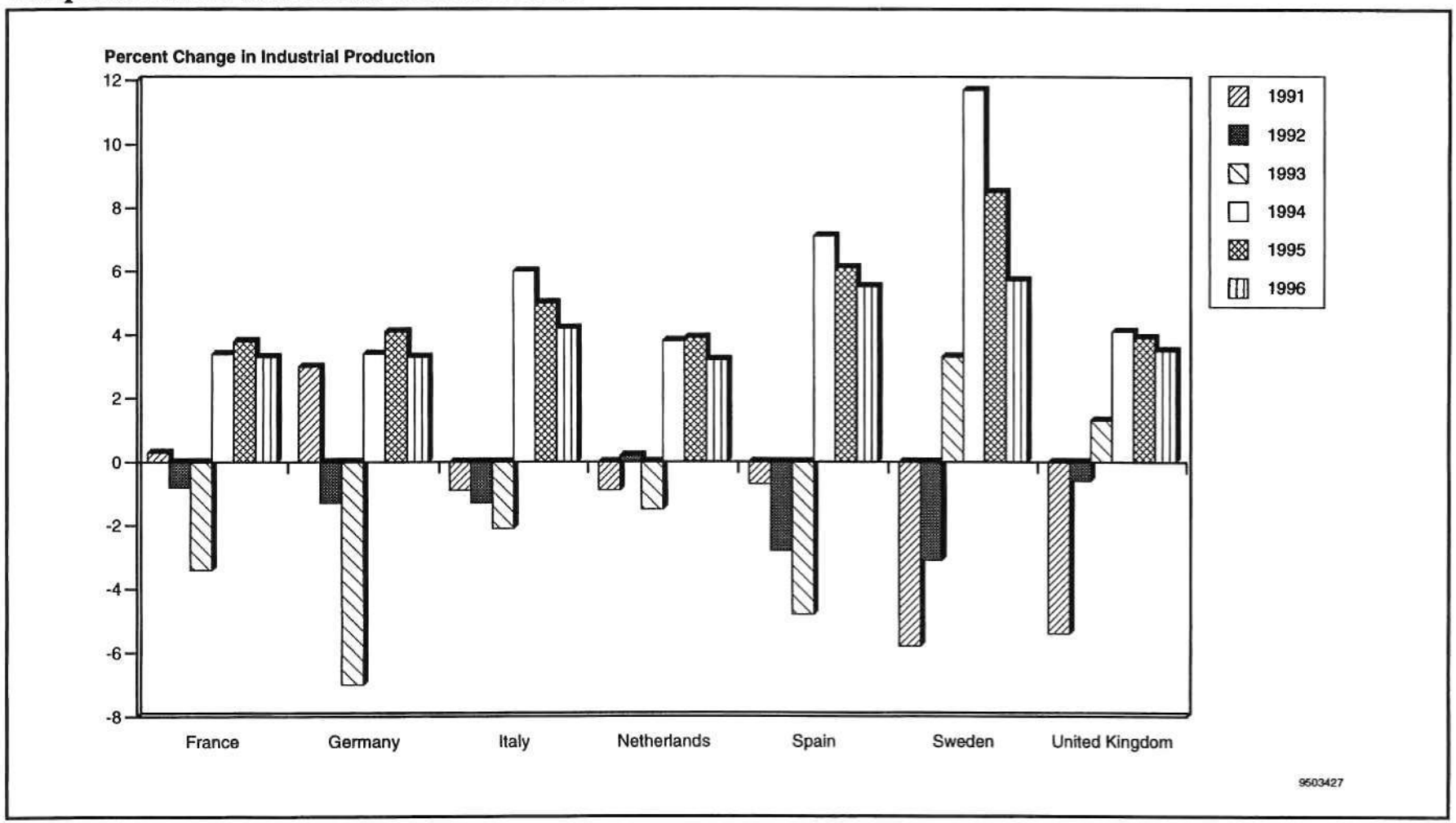
Figure 2
European Industrial Production Growth Forecast



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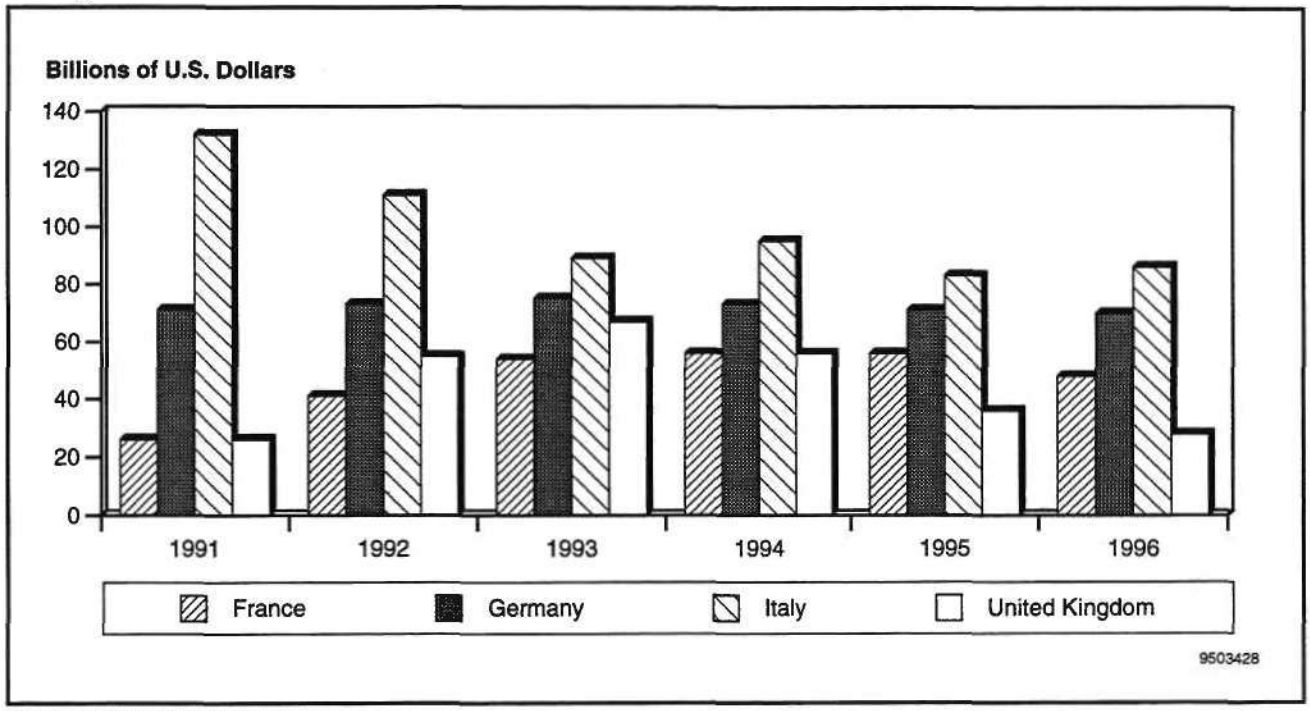
Figure 3
European Business Investment Growth Forecast



Source: Consensus Forecasts

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Figure 4
European Public-Sector Deficit Forecast



Source: Consensus Forecasts

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For More Information...

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Internet address .....pgartzen@dataquest.com
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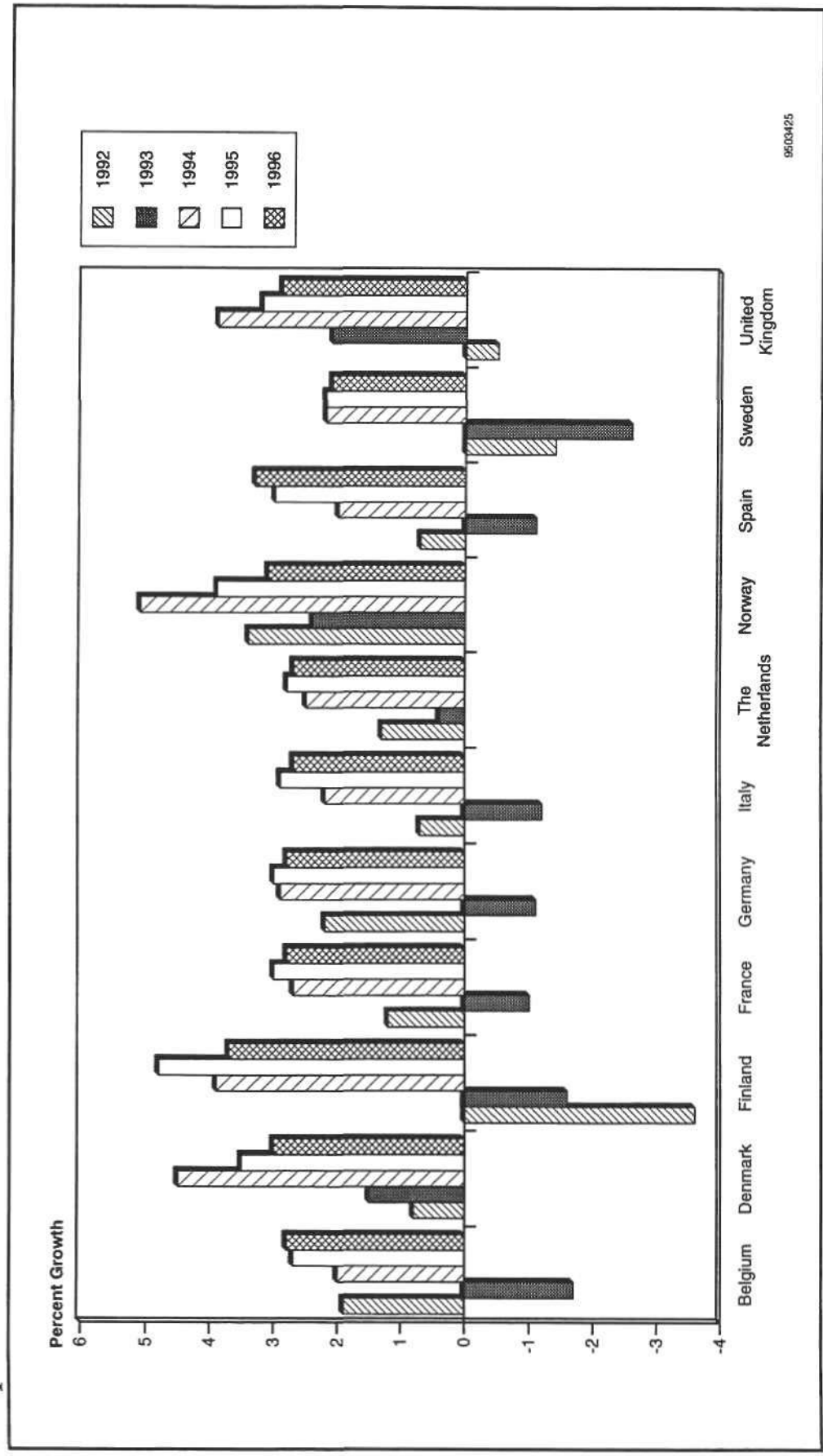
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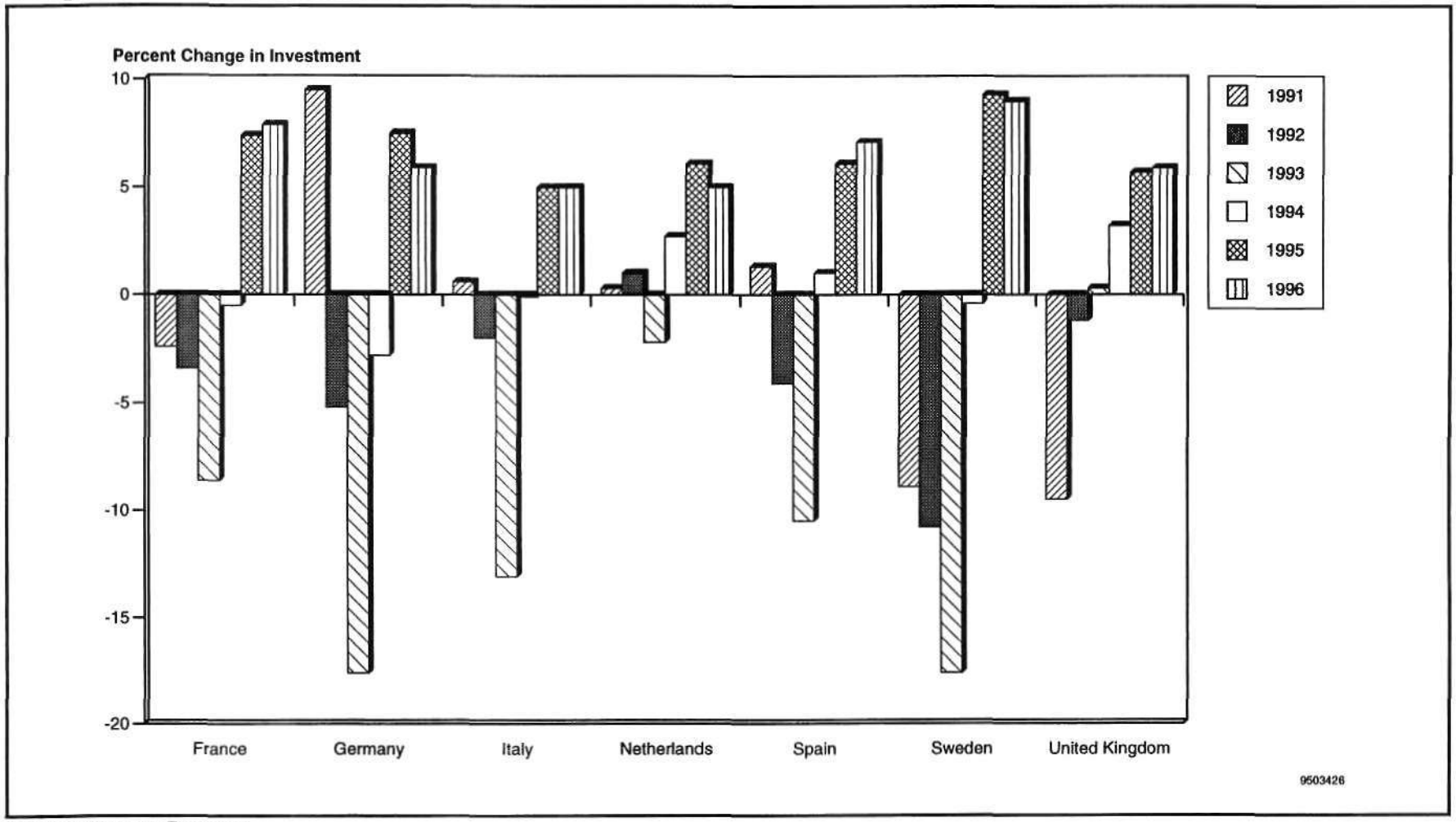
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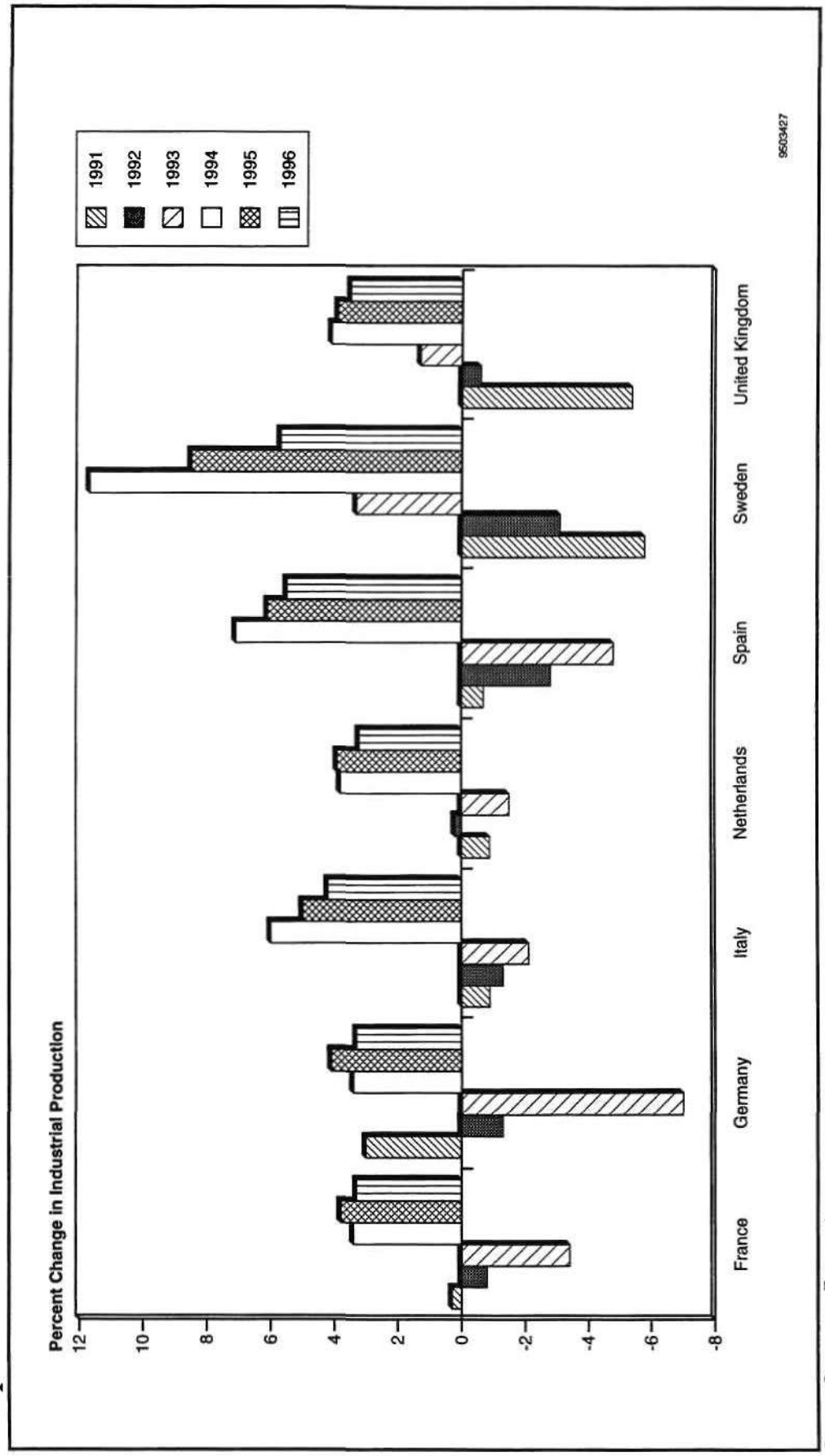
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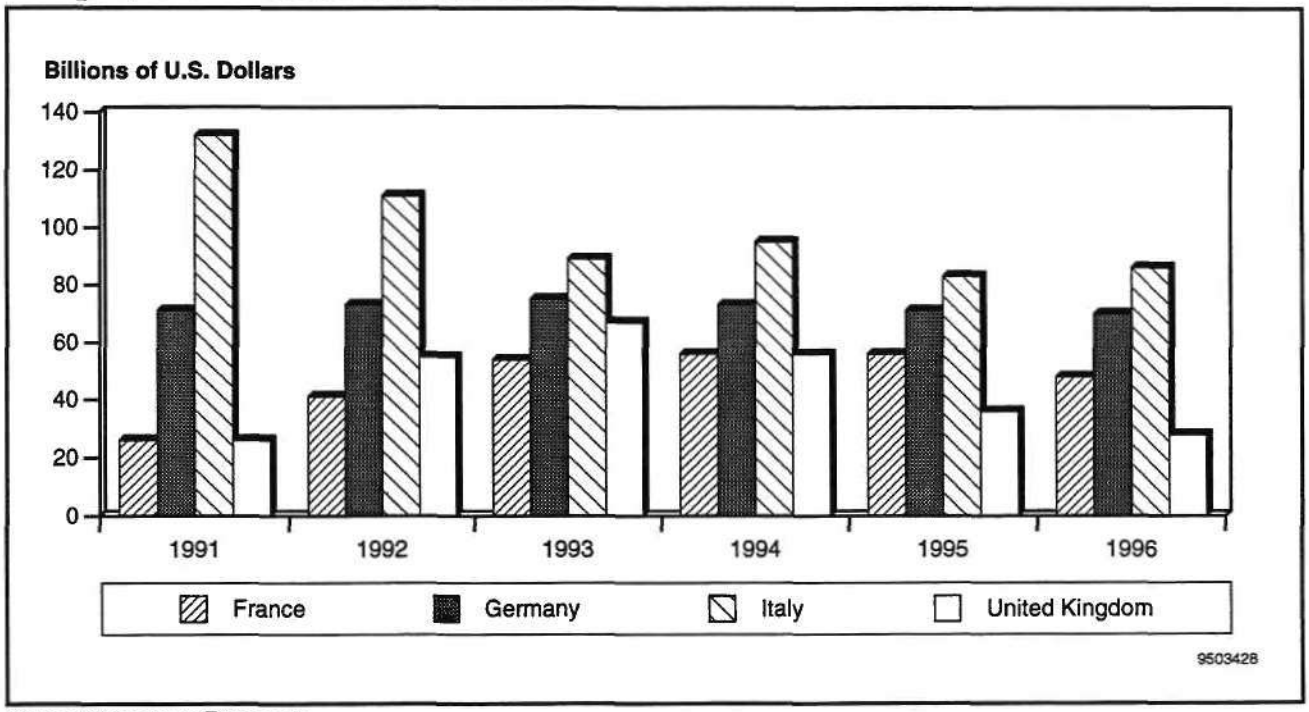
Figure 3
European Business Investment Growth Forecast



Source: Consensus Forecasts

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Figure 4
European Public-Sector Deficit Forecast



Source: Consensus Forecasts

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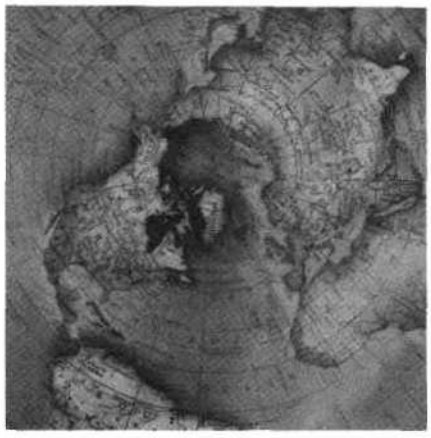
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Market Analysis



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CAD/CAM/CAE and GIS Europe Forecast Update

Market Statistics

Program: CAD/CAM/CAE/GIS Europe
Product Code: CCAM-EU-MS-9513
Publication Date: December 4, 1995
Filing: Market Analysis

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Note: All tables show estimated data.

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Chapter 1
CAD/CAM/CAE and GIS Europe Forecast Update

Fluctuating exchange rates once again masked the true market performance in the 1994 CAD/CAM/CAE and GIS market. Japanese CAD/CAM/CAE and GIS total factory revenue grew 4.8 percent from 1993 to 1994 when measured in U.S. dollars, contrary to what would be expected given the country's prolonged recession. However, the dollar depreciated against the yen at a rate of 8.2 percent so that when measured in yen, Japanese CAD/CAM/CAE and GIS total factory revenue declined 3.8 percent from 1993 to 1994.

Less dramatically, European CAD/CAM/CAE and GIS total factory revenue grew 9.9 percent from 1993 to 1994 when measured in U.S. dollars. With the dollar depreciating 1.5 percent, European CAD/CAM/CAE and GIS total factory revenue grew a lower 8.2 percent from 1993 to 1994 when measured in ECU. Table 1 shows the impact of currency fluctuation on the CAD/CAM/CAE and GIS software market.

Looking ahead, currency fluctuations will continue to be felt in all global markets. The dollar has continued to weaken during the early months of this year so that if we were to assume a stable currency for the remainder of the year, 1995 would end with the dollar depreciating 4.2 percent against the yen and 7.8 percent against the ECU (see Table 2). Although Dataquest does not forecast currency exchange rates, we do forecast with the best information available. The exchange rate is calculated as the simple arithmetic mean of the 12 average monthly rates for each country. For the purpose of this forecast, Dataquest assumes the September exchange rate will remain stable in the future.

This document contains Dataquest's detailed forecast information for the CAD/CAM/CAE and GIS industry. Included are the following:

- Five-year historical data
- Five-year forecast data

More detailed data is available through Dataquest's Client Inquiry service, which can provide custom analysis of the multidimensional database.

Changes to Our Forecast Structure

Dataquest's CAD/CAM/CAE and GIS forecast is based upon the updated market share data gathered before the end of 1994 and updated throughout 1995. In order to better serve you, the new CAD/CAM/CAE and GIS database has been restructured as follows:

- Japan is now tracked as a region separate from Asia/Pacific.
- Asia/Pacific now includes China, Hong Kong, Korea, Singapore, Taiwan, and Rest of Asia (Australia, New Zealand, India, and Southeast Asia).

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Table 1
CAD/CAM/CAE and GIS Revenue Growth Comparison
(U.S. Dollars versus Local Currency for Both Europe and Japan)

Revenue by Region	1993	1994	Forecast 1999	Growth (%) 1993-1994	CAGR (%) 1994-1999
Europe ($M)					
Software Revenue	1,628.29	1,824.12	3,276.03	12.0	12.4
Hardware Revenue	2,421.88	2,604.55	5,022.05	7.5	14.0
Service Revenue	996.57	1,115.23	1,976.19	11.9	12.1
Total Factory Revenue	5,046.74	5,543.91	10,274.27	9.9	13.1
ECU/U.S.$ Exchange Rate*	0.86	0.84	0.77	-1.5	-1.8
Europe (ECU Millions)					
Software Revenue	1,394.80	1,538.83	2,522.54	10.3	10.4
Hardware Revenue	2,074.58	2,197.20	3,866.98	5.9	12.0
Service Revenue	853.67	940.81	1,521.67	10.2	10.1
Total Factory Revenue	4,323.04	4,676.84	7,911.19	8.2	11.1
Japan ($M)					
Software Revenue	1,203.33	1,315.70	2,013.89	9.3	8.9
Hardware Revenue	2,148.02	2,174.59	2,893.95	1.2	5.9
Service Revenue	756.90	813.74	1,074.17	7.5	5.7
Total Factory Revenue	4,108.24	4,304.03	5,982.01	4.8	6.8
Japan/U.S.$ Exchange Rate*	110.85	101.81	99.73	-8.2	-0.4
Japan (Yen Millions)					
Software Revenue	133,388.69	133,951.14	200,845.20	0.4	8.4
Hardware Revenue	238,107.55	221,394.71	288,613.32	-7.0	5.4
Service Revenue	83,902.25	82,847.36	107,126.86	-1.3	5.3
Total Factory Revenue	455,398.49	438,193.21	596,585.38	-3.8	6.4
North America ($M)					
Software Revenue	1,758.41	1,929.06	3,711.42	9.7	14.0
Hardware Revenue	2,345.76	2,512.99	4,526.12	7.1	12.5
Service Revenue	1,036.93	1,176.56	1,916.85	13.5	10.3
Total Factory Revenue	5,141.36	5,618.72	10,154.40	9.3	12.6
Worldwide ($M)					
Software Revenue	4,890.91	5,418.96	9,776.21	10.8	12.5
Hardware Revenue	7,351.48	7,798.97	13,510.08	6.1	11.6
Service Revenue	2,968.24	3,313.93	5,319.26	11.6	9.9
Total Factory Revenue	15,210.89	16,531.96	28,605.55	8.7	11.6

*Assuming a stable currency, the 1999 exchange rate is the September 1995 exchange rate.
Source: Dataquest (October 1995)

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Table 2
Foreign Currency versus the U.S. Dollar

		Actual					Current		Year-to-Year Change (%)					
Country	Currency	1990	1991	1992	1993	1994	1995	1996	1990-1991	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996
Austria	Schilling	11.36	11.67	10.95	11.65	11.40	10.32	10.05	2.73	-6.2	6.4	-2.1	-9.5	-2.6
Belgium	Franc	33.41	34.13	32.02	34.67	33.66	30.16	29.38	2.16	-6.2	8.3	-2.9	-10.4	-2.6
Denmark	Krone	6.18	6.39	6.02	6.49	6.35	5.70	5.54	3.40	-5.8	7.8	-2.2	-10.2	-2.8
Finland	Markka	3.82	4.04	4.45	5.73	5.21	4.39	4.27	5.76	10.1	28.8	-9.1	-15.7	-2.7
France	Franc	5.44	5.64	5.27	5.67	5.54	5.04	4.92	3.68	-6.6	7.6	-2.3	-9.0	-2.4
Germany	D-Mark	1.62	1.66	1.56	1.66	1.62	1.45	1.43	2.47	-6.0	6.4	-2.4	-10.8	-1.0
Italy	Lira	1,197.22	1,238.93	1,227.75	1,577.85	1,609.34	1,625.01	1,616.00	3.48	-0.9	28.5	2.0	1.0	-0.6
Netherlands	Guilder	1.82	1.87	1.75	1.86	1.82	1.64	1.64	2.75	-6.4	6.3	-2.2	-9.9	0.2
Norway	Krone	6.25	6.49	6.18	7.11	7.04	6.42	6.25	3.84	-4.8	15.0	-1.0	-8.8	-2.6
Spain	Peseta	102.03	103.81	101.90	127.87	133.48	125.35	123.48	1.74	-1.8	25.5	4.4	-6.1	-1.5
Sweden	Krona	5.92	6.04	5.81	7.82	7.70	7.30	6.95	2.03	-3.8	34.6	-1.5	-5.2	-4.8
Switzerland	Franc	1.39	1.43	1.40	1.48	1.37	1.20	1.16	2.88	-2.1	5.7	-7.4	-12.7	-3.0
United Kingdom	Pound	0.56	0.57	0.57	0.67	0.65	0.64	0.63	1.79	0	17.5	-3.0	-1.5	-1.6
Europe Average	ECU	0.79	0.81	0.77	0.86	0.84	0.78	0.77	2.27	-4.9	11.4	-1.5	-7.8	-1.0
China	Renminbi	4.79	5.33	5.51	5.76	8.54	8.32	8.32	11.27	3.4	4.5	48.3	-2.6	0
Hong Kong	Dollar	7.79	7.77	7.74	7.74	7.73	7.74	7.73	-0.26	-0.4	0	-0.1	0.1	-0.1
Japan	Yen	144.05	134.59	126.34	110.85	101.56	97.34	99.73	-6.57	-6.1	-12.3	-8.4	-4.2	2.5
Korea	Won	242.70	730.67	782.41	799.42	805.80	773.20	768.20	201.06	7.1	2.2	0.8	-4.0	-0.6
Singapore	Dollar	1.81	1.73	1.63	1.62	1.53	1.42	1.42	-4.42	-5.8	-0.9	-5.3	-7.2	0
Taiwan	Dollar	26.64	26.49	24.93	26.15	26.45	27.50	27.06	-0.56	-5.9	4.9	1.1	4.0	-1.6

Source: Dataquest (October 1995)

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- Service is divided into hardware service and software service.
- Platforms have been replaced by operating systems, to include UNIX, host, Windows NT and PC.

This restructuring is reflected in the forecast. The net result is a better history from which to forecast. Unfortunately, because of this restructuring, the data will not match the data in Dataquest's previously published market share documents. In addition to some shifting of revenue to allow for the restructuring, several company changes were made as follows:

- Work in the new database resulted in the loss of some companies' European and Asian revenue, most notably Altera. The revenue for these companies has been corrected and is available through your inquiry privilege.
- UniCAD had inadvertently been excluded from our market share database and was therefore not included in previously published market share documents. It has been added.
- Mentor Graphics restated its revenue for 1992 and 1993, correcting an error in its reporting by shifting revenue from the year of order to the year of sale and realigning its sales to our changed subapplication definitions.

Worldwide Forecast Assumptions

The following paragraphs describe the main forces driving the CAD/CAM/CAE and GIS worldwide software forecast.

Mechanical Forecast Assumptions

The mechanical CAD/CAM/CAE market, which grew 9.7 percent in 1994, is expected to reach a market size of $3.9 million in five years. The market will be fueled by a complex and rich blend of emerging technologies, regional growth, and new applications for CAD technology.

Emerging Technologies

Topping the list of emerging technologies is product data management. This market has clearly begun to take off, not only in Europe and the United States but in Japan and Korea as well. Within the past year, we have seen pilot programs begin to move to full-scale production, support for new client platforms (Windows NT, Windows), integration with materials resource planning (MRP) systems, and an emergence of a "lite" product data management (PDM) category. PDM will be one of the significant drivers of the mechanical CAD market through 1999. Farther down the road, we expect growth in the industry to come from other emerging technologies, including generative numerical control (NC) software, analysis, conceptual design, and simulation/optimization software.

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Regional Growth

The outlook for the European markets is brighter than it has been for the last few years. The European economy as a whole continues to emerge slowly from its recession, and many of the European industries have begun a major restructuring of their information technology (IT) investment. Tool purchases by automotive companies and their supplier bases will lead to higher growth for both software and hardware revenue in the mechanical CAD/CAM/CAE sector in Europe.

Mechanical CAD/CAM/CAE growth in Japan is expected to undergo a significant shift in platform usage over our forecast period. Currently, the UNIX platform dominates the mechanical sector in Japan, despite the fact the Japanese mechanical market still places a heavy emphasis on 2-D drafting instead of 3-D/solid modeling. We expect this drafting orientation to persist, and in the next five years we anticipate a significant shift to more Windows NT and PC-based operating systems, at the expense of UNIX. This shift will not begin in earnest until late 1996, when Japan-specific versions of mechanical software on Windows NT are more widely available.

New Applications for CAD Technology

In 1994, we saw the beginning of new applications for mechanical CAD technology. Growth is picking up in nontraditional industries (those industries outside of aerospace and automotive). We expect this trend to continue as mechanical modeling, analysis, design, and simulation software become more user-friendly. Closely linked to the use of mechanical CAD in new arenas is the availability of such software on lower-cost platforms like Windows NT and the use of object technology to create customized industry- or application-specific solutions.

AEC Forecast Assumptions

The Impact of Windows NT

Intergraph dominates the UNIX market in North America, and the company's shift to Windows NT will cause both the collapse of UNIX sales in North America and the gradual erosion of UNIX in Europe. Windows NT will get a boost in 1995, driven by frustrated PC users who demand high performance and who cannot wait for Windows 95 to solve their requirements.

Factors that should contribute to the long-term expansion of the AEC CAD market are as follows:

CAD Is Becoming a Business Requirement

Large design firms are growing at the expense of smaller firms. These large end users increasingly require their employees and suppliers to adopt automation tools in the design and construction process. Smaller design firms must increasingly buy CAD systems or risk being dropped from consideration as a partner.

CAD purchases are increasingly justified as a competitive advantage in both sales and design reviews. Electronic design data is also required

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downstream by the designer's client, from the federal government down to the small commercial developer. Also, a significant pool of untapped users still exists. The current relatively low market penetration of AEC CAD systems should allow steady worldwide growth during the next five years, despite constant volatility in demand for the buildings and infrastructure to be designed.

New Features in AEC CAD Products Are Achievable

Better, lower-cost visualization tools will be in increasing demand as sales and communication tools. Data and database functions (versus graphics functions) are increasing in importance in AEC design systems, creating opportunities to sell users significant new functionality. Some vendors will create products that foster communication in the entire design, construction, and maintenance process, products that will increase the payoff in CAD investments.

The following trends will inhibit growth in the AEC CAD industry:

Design Is Only Part of the Problem

AEC's one-design-one-build structure means CAD provides fewer economic benefits to these users than does the one-design-build-many structure of manufacturing. Construction, which is essentially a prototype build, is fraught with uncertainties and delays that are not well addressed by existing AEC systems. Design tools can only thrive in the AEC structure when they support more of the entire business problem.

Poor Cooperation among Users

Users are poorly organized to take advantage of improved products, partly because of competition between engineering constructors and partly because designs are often split among several different companies representing different and competing aspects of the design process. New approaches to the design and construction process are needed to allow users to take full advantage of CAD tools.

GIS/Mapping Forecast Assumptions

The Impact of Windows NT

Intergraph's move to Windows NT at the expense of UNIX will quickly make PC-based operating systems the dominant revenue stream in North America. In the long term, the GIS UNIX market is highly subject to erosion by Windows NT because of the appeal of better integration of GIS and Windows-based productivity tools.

Factors that should contribute to the long-term expansion of the GIS market are as follows:

There Exists an Abundant Supply of Prospective Buyers

Penetration is still moderately low among core users. Bread-and-butter prospects in government and utilities are charged with maintaining information on land and assets in perpetuity. Many of these prospective buyers are still using paper maps that will degrade over time. This creates a certain inevitability to moving from paper maps to computer-based systems.

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New Technologies Will Drive Growth

Faster, cheaper computers will be continually leveraged to support new software products. Widespread computer-industry developments in open, distributed systems supporting high-speed networking will make it possible for GIS technology to broadly expand its user base. Lower-cost, higher-resolution satellite imagery holds the potential to drive another explosion in GIS market growth among users who cannot afford aerial photography. Advances in aerial photography, global positioning systems (GPSs), and laser range finders are making it possible to create GISs significantly cheaper, more accurate, and more complete than existing paper maps, giving experienced users some compelling reasons to reinvest. Portable and pen-based computers are bringing GIS to new users in field operations.

Data Will Drive Growth

The GIS business market is driving high growth on PCs. However, we see a wide band of uncertainty surrounding the clearly growing revenue opportunity from new applications. Several new applications in GIS are destined to become relatively low-revenue producing features in other software programs (and market), rather than standalone products in the GIS market. At the same time, data is increasing in value relative to software in this low-end market.

GIS has attained a certain indispensability, particularly among federal users and in utilities. As a result, users are beginning to expect to share the data in their various GIS systems. Within three years, we expect data to be readily exchangeable across different systems. At that point, shareable data will help drive market growth.

Several factors seriously constrain the long-term expansion of the GIS market, as follows:

High Cost of Entry Remains a Barrier

There will remain an uncertain, but certainly high, cost of creating a working GIS system in traditional environments. No magic will emerge to create a low-cost, meaningful data set for mainstream customers in government and utilities. Data conversion will remain costly because the significant cost of correcting prior errors and omissions on paper maps is inevitably bundled into the cost of "conversion."

Price Pressures Inhibit Growth

Price pressure will hold down total revenue. Innovation is the only way to maintain prices in any software industry, and GIS vendors will struggle in their attempt to create compelling new applications and improved investment payoff for customers.

Electronic Design Automation

The EDA software market grew 16.8 percent in 1994. Over the next five years, growth will continue to be fueled by continually increasing design complexity and ever-higher speeds.

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Electronic CAE

The demands today's tools place on CPU processing speed and memory size are reversing the process of equalization and driving the sales of UNIX-class tools. Equalization (PC-based tools becoming more expensive as UNIX-based tools fall in price) was either caused by the stagnation of the design challenge or, more likely, the stagnation in tool development. Design complexity is forcing a large-scale swap: gate-level users are swapping up to registered transfer (RT)-level while RT-level users are swapping up to electronic system (ES)-level tools. RT-level tools will begin to appear on Windows NT, competing with the UNIX-based tools while the ES-level tools will remain UNIX-based. Meanwhile, low-end design—still manageable by PC-based tools—is shifting to Asia/Pacific and driving PC growth in that region. The main inhibitor to growth in CAE tools is the engineering learning curve.

IC Layout

The IC-layout market grew as expected, 20 percent from 1993 to 1994, after several very sleepy years. Design complexity and high speed is forcing replacement of obsolete tools, driving this high growth. This is primarily a replacement market of very high-cost tools and very few players. The ensuing frenzy for market share is the result. The few PC-based tools in this market are being replaced by UNIX-class tools in North America and Japan. Growth in the very few PC-based tools is in Europe (including eastern Europe) and Asia/Pacific. It is yet unclear whether Windows NT will be able to penetrate the IC Layout market.

PCB/MCM/Hybrid

The 3.3 percent growth in the printed circuit board (PCB) market comes as a surprise, given the forecast negative 2 percent growth from 1993 to 1994. The strong yen masked a decline in PCB growth (in yen) in Japan, where half of PCB sales are.

Organizational manufacturing models are driving changes in the PCB market. As manufacturing organizations are moving to Asia/Pacific (from both North America and Japan), the low-speed designing is following, driving PC sales in that region. In North America, Europe, and Japan, high-speed board design is moving from manufacturing into engineering departments that are traditionally UNIX-based. Where new engineering environments are being created for RT-level designs, the opportunity for Windows NT to take over both the CAE environment and the PCB environment exists.

Forecast Methodology

Fundamental to the way Dataquest conducts its research is the underlying philosophy that the best data and analyses come from a well-balanced program. This program includes the following: balance between primary and secondary collection techniques; balance between supply-side and demand-side analysis; balance between focused, industry-specific research and coordinated, "big-picture" analysis aided by integration of data from the more than 25 separate high-technology industries Dataquest covers; and balance between the perspectives of

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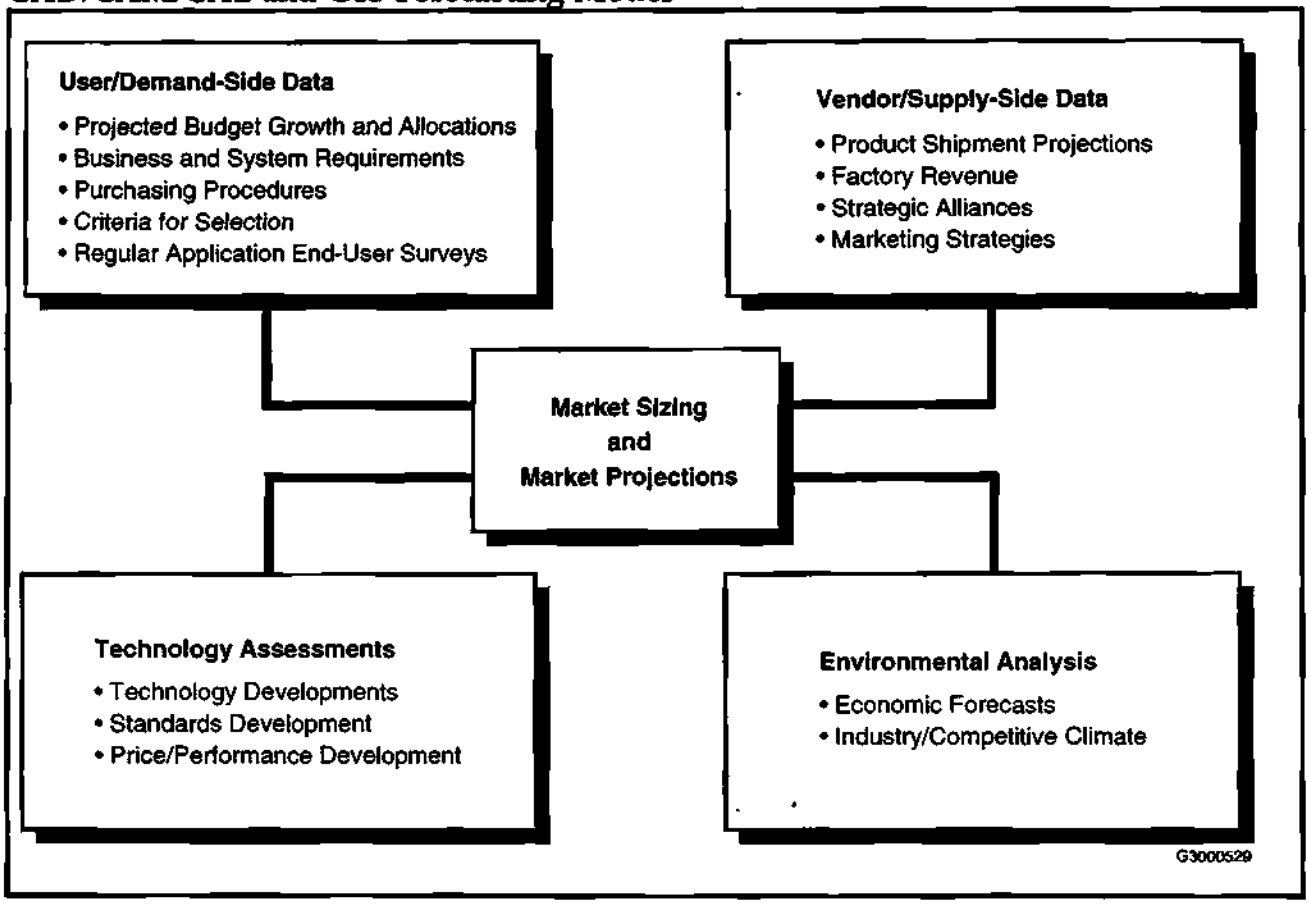
experienced industry professionals and rigorous, disciplined techniques of seasoned market researchers.

Dataquest also analyzes trends in the macro environment, which can have major influences on both supply-side and demand-side forecasting. In addition to demographics, analysts look at gross national product (GNP) growth, interest rate fluctuation, business expectations, and capital spending plans. In the geopolitical arena, the group looks at trade issues, political stability or lack thereof, tariffs, nontariff barriers, and such factors as the effect on Europe of the events of 1994.

Figure 1 shows the CAD/CAM/CAE and GIS forecasting model. The overall forecasting process uses a combination of techniques such as time series and technological modeling. Market estimates and forecasts are derived using the following research techniques:

- Segment forecasting—Individual forecasts are derived for each application segment tracked by the CAD/CAM/CAE and GIS group. Specifically, each application, segmented by region and platform, is forecast and rolled up. In this way, each application segment incorporates its own set of unique assumptions.

Figure 1
CAD/CAM/CAE and GIS Forecasting Model



Source: Dataquest (May 1995)

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- Demand-based analysis—Market growth is tracked and forecast in terms of the present and anticipated demand of current and future users. This requires the development of a total available market model and a satisfied available market figure to assess the levels of penetration accurately. Dataquest analysts also factor in the acceptance or ability for users to consume new technology.
- Capacity-based analysis—This method involves identifying future shipment volume constraints. These constraints, or "ceilings," can be the result of component availability, manufacturing capacity, or distribution capacity. In any case, capacity limitations are capable of keeping shipments below the demand level.

Segmentation Definitions

This section lists the definitions specific to this document. The following paragraphs define the segments.

Applications

- Mechanical—The mechanical segment refers to computer-aided tools used by engineers, designers, analysts, technicians, and draftspeople working predominantly in the discrete manufacturing industries, but includes government and education. Users of mechanical CAD/CAM/CAE tools work in all departments across the typical organization, with a majority found in product design, advanced engineering, and manufacturing engineering. Common design applications include conceptual design, industrial design, structural or thermal analysis, detail design, and electromechanical design (the mechanical part of design with electrical or electronic components and mechanisms). Common manufacturing applications include tool and fixture design, numerical control part programming, offline robotics programming, and interface to quality-control systems. Management tools for database control and distribution are included in this segment, as well as user-defined application programming.
- Architecture, Engineering, and Construction (AEC)—The AEC segment covers the use of computer-aided tools by architects, contractors, plant engineers, civil engineers, and other people associated with these disciplines to aid in designing and managing buildings, industrial plants, ships, and other types of nondiscrete entities.
- Geographic Information Systems (GIS)/Mapping—GIS is computer-based technology, and the segment is composed of hardware, software, and data used to capture, edit, display, and analyze spatial (tagged by location) information.
- Electronic Design Automation (EDA)—The EDA segment covers computer-based tools used to automate the process of designing an electronic product, including printed circuit boards, ICs, and systems. EDA includes ECAE, IC layout, and PCB/hybrid/MCM, as follows:
  - Electronic computer-aided engineering (ECAE)—These are computer-aided tools used in the engineering or design phase of electronic products (as opposed to the physical layout phase of the

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product). Examples of ECAE applications are schematic capture and simulation.

- IC layout—This is a software application tool used to create and validate the physical implementation of an IC. The IC layout category comprises polygon editors, symbolic editors, placement and routing (gate array, cell, and block), design verification tools (DRC/ERC/logic-to-layout), compilers, and module development tools.
- PCB/hybrid/MCM—This segment covers products used to create the placement and routing of the traces and components laid out on a printed circuit board. Also included in this category are thermal analysis tools.

Regions

The following bullets define the regions.

- North America—North America includes United States, Mexico, and Canada.
- Europe—Europe includes the United Kingdom, Scandinavia, Benelux, France, Germany, Italy, Spain, Austria/Switzerland, Russia, central Europe, and the rest of Europe.
- Japan
- Asia—Asia includes Singapore, Taiwan, Korea, China, Hong Kong, and the rest of Asia (Australia, India, and Southeast Asia).
- Rest of World—Rest of World includes all other countries and regions, including Africa, the Middle East, Central America, and South America.

Operating Systems

The following paragraphs define the operating systems.

UNIX. UNIX includes all UNIX variants and older workstation operating systems.

Host. Host includes minicomputer and mainframe operating systems in which external workstations' functions are dependent on a host computer.

Windows NT. Windows NT is the Microsoft operating system.

PC. PC includes DOS, Windows, Windows 95, OS/2, and Apple operating systems.

Line Items

Line item definitions are as follows:

- Average selling price (ASP) is defined as the average price of a product, inclusive of any discounts.
- CPU revenue is the portion of revenue derived from a system sale that is related to the value of the CPU.

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- CPU shipment is defined as the number of CPUs delivered.
- CPU installed base is defined as the total number of CPUs in active, day-to-day use.
- Unit shipment is defined as the number of products delivered (that is, seats).
- Seats are defined as the number of possible simultaneous users.
- Installed seats are defined as the total number of seats in active, day-to-day use.
- Hardware revenue is defined as the sum of the revenue from the hardware system components: CPU revenue, terminal revenue, and peripherals revenue.
- Peripherals revenue is defined as the value of all the peripherals from turnkey sale. (Peripherals in this category typically are input and output devices.)
- Terminal revenue is defined as revenue derived from the sale of terminals used to graphically create, analyze, or manipulate designs. The term is applicable only to the host systems.
- Software revenue is revenue derived from the sale of application software.
- Service revenue is defined as revenue derived from the service and support of CAD/CAM/CAE or GIS systems. Service is followed as software service and hardware service.
- Total factory revenue is defined as the amount of money received for goods measured in U.S. dollars and is the sum of hardware, software, and service revenue.

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Table A-1
CAD/CAM/CAE/GIS Software History and Forecast
Top Level Worldwide Forecast, All Applications, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
Software Revenue ($M)									
Worldwide, All Operating Systems	4,583	4,891	5,419	6,224	6,942	7,763	8,691	9,776	12.5
Worldwide									
UNIX	3,163	3,401	3,796	4,249	4,630	5,007	5,439	5,913	9.3
Windows NT	-	5	106	356	568	872	1,201	1,621	72.4
Personal Computer	1,066	1,190	1,327	1,484	1,652	1,827	2,012	2,214	10.8
Host/Proprietary	354	295	190	136	92	58	39	27	-32.1
All Operating Systems									
North America	1,599	1,759	1,929	2,170	2,480	2,863	3,279	3,711	14.0
Europe	1,668	1,628	1,824	2,178	2,410	2,650	2,926	3,276	12.4
Japan	1,117	1,203	1,316	1,445	1,563	1,694	1,840	2,014	8.9
Asia/Pacific	137	207	255	320	364	415	484	587	18.2
Rest of World	61	94	95	112	125	141	161	187	14.5
Year-to-Year Software Revenue Growth Rate (%)									
Worldwide, All Operating Systems		6.7	10.8	14.9	11.5	11.8	11.9	12.5	
Worldwide									
UNIX		7.5	11.6	11.9	9.0	8.1	8.6	8.7	
Windows NT		NA	1,950.4	234.2	59.8	53.4	37.8	35.0	
Personal Computer		11.6	11.5	11.8	11.3	10.6	10.1	10.1	
Host/Proprietary		-16.7	-35.6	-28.3	-32.5	-36.6	-32.2	-30.4	
All Operating Systems									
North America		10.0	9.7	12.5	14.3	15.5	14.5	13.2	
Europe		-2.4	12.0	19.4	10.7	10.0	10.4	12.0	
Japan		7.7	9.3	9.8	8.2	8.4	8.6	9.4	
Asia/Pacific		51.3	22.9	25.4	13.8	14.1	16.5	21.5	
Rest of World		53.2	1.7	17.7	11.5	12.6	14.6	16.3	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-1
CAD/CAM/CAE/GIS Software History and Forecast
Detail Europe Forecast, All Applications, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	217,863	236,421	260,981	287,900	322,400	355,200	392,000	436,400	11
Seats	227,789	242,550	266,309	292,200	325,600	357,500	393,700	437,700	10
Year-to-Year Increase (%)	12	6	10	10	11	10	10	11	
Installed Base									
CPUs	805,524	935,400	1,075,840	1,206,100	1,331,400	1,449,100	1,542,900	1,619,500	9
Seats	858,576	984,052	1,119,483	1,243,800	1,363,900	1,478,200	1,570,200	1,645,400	8
Year-to-Year Increase (%)	20	15	14	11	10	8	6	5	
REVENUE DATA ($M)									
CPU Revenue	2,331	2,156	2,367	2,602	2,900	3,212	3,526	3,969	11
Terminal Revenue	159	115	104	73	56	41	32	25	-25
Peripheral Revenue	242	152	134	141	141	143	142	146	2
Hardware Revenue	2,732	2,422	2,605	2,816	3,098	3,396	3,700	4,140	10
Year-to-Year Increase (%)	-3	-11	8	8	10	10	9	12	
Software Revenue	1,668	1,628	1,824	2,178	2,410	2,650	2,926	3,276	12
Year-to-Year Increase (%)	8	-2	12	19	11	10	10	12	
Software Service	506	515	634	703	764	808	859	917	8
Hardware Service	523	482	481	510	540	576	616	675	7
Service Revenue	1,029	997	1,115	1,213	1,304	1,384	1,475	1,592	7
Year-to-Year Increase (%)	8	-3	12	9	7	6	7	8	
Total Factory Revenue	5,429	5,047	5,544	6,207	6,811	7,430	8,102	9,008	10
Year-to-Year Increase (%)	2	-7	10	12	10	9	9	11	

NA = Not applicable
Source: Dataquest (October 1995)

Table B-2
CAD/CAM/CAE/GIS Software History and Forecast
Detail Europe Forecast, Mechanical, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	92,200	91,091	99,479	106,900	116,900	126,300	135,000	144,400	8
Seats	99,777	95,480	103,808	110,600	119,800	128,200	136,400	145,400	7
Year-to-Year Increase (%)	7	-4	9	7	8	7	6	7	
Installed Base									
CPUs	343,281	390,942	440,954	483,700	521,100	557,800	586,400	600,400	6
Seats	382,505	426,802	473,658	512,600	546,600	581,000	608,300	621,300	6
Year-to-Year Increase (%)	19	12	11	8	7	6	5	2	
REVENUE DATA ($M)									
CPU Revenue	1,230	1,068	1,170	1,276	1,379	1,472	1,558	1,662	7
Terminal Revenue	118	88	86	63	48	34	25	18	-27
Peripheral Revenue	159	85	74	72	69	66	63	60	-4
Hardware Revenue	1,507	1,241	1,330	1,411	1,496	1,572	1,645	1,740	6
Year-to-Year Increase (%)	-6	-18	7	6	6	5	5	6	
Software Revenue	844	793	884	1,059	1,152	1,244	1,335	1,435	10
Year-to-Year Increase (%)	4	-6	12	20	9	8	7	7	
Software Service	256	259	346	389	417	430	442	449	5
Hardware Service	307	259	251	269	277	283	290	299	4
Service Revenue	563	518	596	658	695	713	732	748	5
Year-to-Year Increase (%)	-2	-8	15	10	6	3	3	2	
Total Factory Revenue	2,914	2,552	2,811	3,128	3,343	3,529	3,712	3,923	7
Year-to-Year Increase (%)	-3	-12	10	11	7	6	5	6	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-3
CAD/CAM/CAE/GIS Software History and Forecast
Detail Europe Forecast, AEC, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	73,869	84,822	91,393	104,000	116,400	126,100	137,500	150,100	10
Seats	74,708	85,383	91,642	104,100	116,500	126,200	137,500	150,100	10
Year-to-Year Increase (%)	24	14	7	14	12	8	9	9	
Installed Base									
CPUs	244,130	296,698	349,777	400,600	448,800	487,300	512,800	529,900	9
Seats	249,562	301,553	353,738	403,600	451,200	489,200	514,500	531,300	8
Year-to-Year Increase (%)	26	21	17	14	12	8	5	3	
REVENUE DATA ($M)									
CPU Revenue	445	410	468	556	641	712	776	850	13
Terminal Revenue	15	9	3	2	1	1	1	0	-37
Peripheral Revenue	45	30	28	34	35	36	37	38	6
Hardware Revenue	505	450	500	591	677	750	813	888	12
Year-to-Year Increase (%)	8	-11	11	18	14	11	8	9	
Software Revenue	340	326	375	461	513	554	606	663	12
Year-to-Year Increase (%)	19	-4	15	23	11	8	9	9	
Software Service	68	58	61	74	81	86	93	99	10
Hardware Service	72	62	73	83	90	97	106	115	10
Service Revenue	140	120	134	157	172	184	199	215	10
Year-to-Year Increase (%)	19	-14	12	17	10	7	8	8	
Total Factory Revenue	985	896	1,009	1,209	1,361	1,487	1,618	1,766	12
Year-to-Year Increase (%)	13	-9	13	20	13	9	9	9	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-4
CAD/CAM/CAE/GIS Software History and Forecast
Detail Europe Forecast, GIS/Mapping, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	19,989	25,814	33,270	38,900	46,000	53,600	62,200	71,500	17
Seats	21,205	26,959	33,860	39,100	46,000	53,600	62,200	71,500	16
Year-to-Year Increase (%)	35	27	26	15	18	17	16	15	
Installed Base									
CPUs	63,920	82,868	107,879	134,500	163,700	192,500	216,000	240,000	17
Seats	69,211	88,381	112,955	138,600	167,100	195,200	218,400	242,000	16
Year-to-Year Increase (%)	30	28	28	23	21	17	12	11	
REVENUE DATA ($M)									
CPU Revenue	288	321	369	407	457	525	588	665	12
Terminal Revenue	13	8	7	2	1	0	0	0	-70
Peripheral Revenue	33	36	29	34	34	36	37	38	6
Hardware Revenue	333	364	405	443	492	561	625	704	12
Year-to-Year Increase (%)	5	9	11	9	11	14	11	12	
Software Revenue	217	249	284	350	393	441	492	547	14
Year-to-Year Increase (%)	27	14	14	23	12	12	12	11	
Software Service	83	95	106	113	120	127	135	143	6
Hardware Service	66	79	87	88	94	104	113	124	7
Service Revenue	149	174	193	201	214	231	248	267	7
Year-to-Year Increase (%)	50	17	11	4	6	8	8	8	
Total Factory Revenue	700	787	882	993	1,099	1,233	1,366	1,518	11
Year-to-Year Increase (%)	19	13	12	13	11	12	11	11	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-5
CAD/CAM/CAE/GIS Software History and Forecast
Detail Europe Forecast, Electronic Design Automation, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	31,805	34,694	36,839	38,100	43,100	49,200	57,300	70,400	14
Seats	32,100	34,728	36,998	38,300	43,300	49,400	57,500	70,700	14
Year-to-Year Increase (%)	-5	8	7	4	13	14	16	23	
Installed Base									
CPUs	154,192	164,893	177,230	187,400	197,700	211,600	227,600	249,200	7
Seats	157,298	167,317	179,132	188,900	199,100	212,800	229,000	250,800	7
Year-to-Year Increase (%)	8	6	7	5	5	7	8	10	
REVENUE DATA ($M)									
CPU Revenue	368	357	359	363	424	503	605	791	17
Terminal Revenue	15	9	8	6	6	6	7	7	-2
Peripheral Revenue	5	1	2	2	3	4	6	10	38
Hardware Revenue	387	367	369	371	432	513	617	809	17
Year-to-Year Increase (%)	-11	-5	1	0	16	19	20	31	
Software Revenue	267	261	281	307	352	411	492	630	18
Year-to-Year Increase (%)	-2	-2	8	9	14	17	20	28	
Software Service	99	103	122	128	145	164	189	225	13
Hardware Service	78	81	70	70	79	92	108	137	14
Service Revenue	178	184	192	198	224	256	297	362	14
Year-to-Year Increase (%)	10	4	4	3	13	14	16	22	
Total Factory Revenue	831	812	842	876	1,008	1,180	1,406	1,801	16
Year-to-Year Increase (%)	-4	-2	4	4	15	17	19	28	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-6
CAD/CAM/CAE/GIS Software History and Forecast
Detail Europe Forecast, Electronic CAE, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	21,152	24,881	27,824	28,600	31,900	35,500	40,700	49,900	12
Seats	21,207	24,844	27,935	28,700	31,900	35,600	40,800	49,900	12
Year-to-Year Increase (%)	-8	17	12	3	11	11	15	22	
Installed Base									
CPUs	93,905	105,926	119,363	130,400	140,600	150,900	161,200	175,800	8
Seats	94,740	106,491	119,841	130,800	141,000	151,300	161,700	176,300	8
Year-to-Year Increase (%)	14	12	13	9	8	7	7	9	
REVENUE DATA ($M)									
CPU Revenue	240	254	256	260	303	353	419	553	17
Terminal Revenue	6	4	3	2	2	2	2	2	-12
Peripheral Revenue	4	1	1	1	1	2	2	5	35
Hardware Revenue	249	259	260	264	306	356	424	560	17
Year-to-Year Increase (%)	-5	4	1	1	16	16	19	32	
Software Revenue	175	185	202	217	248	285	339	441	17
Year-to-Year Increase (%)	3	6	9	7	14	15	19	30	
Software Service	62	67	80	83	94	104	118	140	12
Hardware Service	51	57	49	49	55	63	73	92	14
Service Revenue	114	125	129	132	149	167	191	232	13
Year-to-Year Increase (%)	21	10	3	3	13	12	14	21	
Total Factory Revenue	538	568	591	613	703	808	954	1,234	16
Year-to-Year Increase (%)	3	6	4	4	15	15	18	29	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-7
CAD/CAM/CAE/GIS Software History and Forecast
Detail Europe Forecast, IC Layout, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	1,449	1,358	1,606	1,700	2,000	2,300	2,700	3,200	15
Seats	1,479	1,296	1,520	1,700	2,000	2,300	2,700	3,200	16
Year-to-Year Increase (%)	4	-12	17	9	18	19	18	18	
Installed Base									
CPUs	8,152	8,476	9,173	9,700	10,500	11,600	12,900	14,300	9
Seats	8,150	8,403	9,017	9,600	10,400	11,500	12,700	14,100	9
Year-to-Year Increase (%)	6	3	7	6	8	11	11	11	
REVENUE DATA ($M)									
CPU Revenue	56	47	51	49	58	69	81	95	13
Terminal Revenue	2	0	-	-	-	-	-	-	NA
Peripheral Revenue	0	-	0	0	0	0	0	0	1
Hardware Revenue	58	47	51	49	58	69	81	95	13
Year-to-Year Increase (%)	1	-19	9	-5	18	18	18	17	
Software Revenue	38	31	35	41	48	57	67	79	18
Year-to-Year Increase (%)	9	-19	13	18	18	18	18	17	
Software Service	13	15	21	23	27	31	34	38	13
Hardware Service	14	13	12	12	13	15	17	20	10
Service Revenue	27	28	33	35	40	46	52	57	12
Year-to-Year Increase (%)	-2	2	20	5	15	14	13	11	
Total Factory Revenue	123	105	119	125	147	172	200	231	14
Year-to-Year Increase (%)	2	-14	13	5	17	17	17	16	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-8
CAD/CAM/CAE/GIS Software History and Forecast
Detail Europe Forecast, PCB/MCM/Hybrid, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	9,204	8,455	7,409	7,900	9,300	11,300	13,800	17,300	19
Seats	9,414	8,588	7,543	8,000	9,400	11,500	14,000	17,500	18
Year-to-Year Increase (%)	4	-9	-12	6	18	22	22	25	
Installed Base									
CPUs	52,135	50,491	48,693	47,300	46,600	49,100	53,500	59,100	4
Seats	54,408	52,424	50,274	48,600	47,700	50,100	54,600	60,400	4
Year-to-Year Increase (%)	0	-4	-4	-3	-2	5	9	10	
REVENUE DATA ($M)									
CPU Revenue	72	57	52	53	63	82	104	143	22
Terminal Revenue	7	4	4	4	4	4	5	5	4
Peripheral Revenue	1	0	1	1	1	2	4	5	41
Hardware Revenue	80	61	57	58	68	89	113	153	22
Year-to-Year Increase (%)	-31	-23	-6	1	17	30	27	36	
Software Revenue	54	45	44	49	56	69	85	110	20
Year-to-Year Increase (%)	-18	-17	-2	12	13	24	23	29	
Software Service	23	21	21	22	24	29	36	47	18
Hardware Service	13	11	9	9	10	14	18	25	22
Service Revenue	37	32	30	31	34	43	54	73	19
Year-to-Year Increase (%)	-7	-13	-5	3	10	25	25	35	
Total Factory Revenue	171	138	132	138	158	201	252	336	21
Year-to-Year Increase (%)	-23	-19	-5	5	14	27	25	33	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-9
CAD/CAM/CAE/GIS Software History and Forecast
Detail Europe Forecast, All Applications, UNIX

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	63,001	63,623	73,805	80,200	89,400	97,500	107,200	117,600	10
Seats	63,001	63,623	73,805	80,200	89,400	97,500	107,200	117,600	10
Year-to-Year Increase (%)	-1	1	16	9	11	9	10	10	
Installed Base									
CPUs	243,574	289,022	340,043	386,100	433,000	481,400	527,100	565,000	11
Seats	243,574	289,022	340,043	386,100	433,000	481,400	527,100	565,000	11
Year-to-Year Increase (%)	26	19	18	14	12	11	10	7	
REVENUE DATA ($M)									
CPU Revenue	1,451	1,405	1,546	1,712	1,892	2,050	2,236	2,435	10
Terminal Revenue	-	-	-	-	-	-	-	-	NA
Peripheral Revenue	191	117	93	90	84	77	71	65	-7
Hardware Revenue	1,643	1,522	1,639	1,802	1,976	2,128	2,307	2,500	9
Year-to-Year Increase (%)	2	-7	8	10	10	8	8	8	
Software Revenue	1,173	1,103	1,240	1,459	1,610	1,745	1,903	2,072	11
Year-to-Year Increase (%)	10	-6	12	18	10	8	9	9	
Software Service	447	444	544	606	654	676	700	713	6
Hardware Service	363	379	363	407	435	456	480	505	7
Service Revenue	811	823	908	1,013	1,089	1,132	1,181	1,217	6
Year-to-Year Increase (%)	24	2	10	12	8	4	4	3	
Total Factory Revenue	3,626	3,448	3,787	4,274	4,676	5,005	5,390	5,789	9
Year-to-Year Increase (%)	9	-5	10	13	9	7	8	7	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-10
CAD/CAM/CAE/GIS Software History and Forecast
Detail Europe Forecast, All Applications, NT/Hybrid

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	-	52	2,414	8,000	10,700	15,100	20,000	28,900	64
Seats	-	52	2,414	8,000	10,700	15,100	20,000	28,900	64
Year-to-Year Increase (%)	NA	NA	4,522	233	33	41	33	44	
Installed Base									
CPUs	-	52	2,435	10,500	21,200	31,900	41,900	58,400	89
Seats	-	52	2,435	10,500	21,200	31,900	41,900	58,400	89
Year-to-Year Increase (%)	NA	NA	4,563	330	102	51	31	39	
REVENUE DATA ($M)									
CPU Revenue	-	1	31	126	166	259	360	565	79
Terminal Revenue	-	-	-	-	-	-	-	-	NA
Peripheral Revenue	-	0	5	18	20	26	29	37	52
Hardware Revenue	-	1	35	144	186	285	389	601	76
Year-to-Year Increase (%)	NA	NA	3,606	310	29	53	37	55	
Software Revenue	-	1	38	136	181	255	336	471	66
Year-to-Year Increase (%)	NA	NA	2,511	259	33	41	31	40	
Software Service	-	0	10	31	44	68	94	137	70
Hardware Service	-	0	16	31	40	59	78	113	47
Service Revenue	-	1	26	63	84	127	172	249	57
Year-to-Year Increase (%)	NA	NA	4,587	143	34	51	35	45	
Total Factory Revenue	-	3	99	343	451	667	896	1,322	68
Year-to-Year Increase (%)	NA	NA	3,251	247	32	48	34	47	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-11
CAD/CAM/CAE/GIS Software History and Forecast
Detail Europe Forecast, All Applications, Personal Computer

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	152,054	170,135	182,560	198,200	221,200	241,700	264,200	289,400	10
Seats	152,054	170,135	182,562	198,200	221,200	241,700	264,200	289,400	10
Year-to-Year Increase (%)	22	12	7	9	12	9	9	10	
Installed Base									
CPUs	545,984	630,894	718,963	796,800	866,000	925,400	963,900	986,500	7
Seats	545,984	630,894	718,963	796,800	866,000	925,400	963,900	986,500	7
Year-to-Year Increase (%)	20	16	14	11	9	7	4	2	
REVENUE DATA ($M)									
CPU Revenue	473	501	562	611	731	826	875	929	11
Terminal Revenue	-	-	-	-	-	-	-	-	NA
Peripheral Revenue	27	23	27	29	35	39	42	44	10
Hardware Revenue	500	524	588	639	766	865	917	973	11
Year-to-Year Increase (%)	11	5	12	9	20	13	6	6	
Software Revenue	379	432	478	532	583	626	672	723	9
Year-to-Year Increase (%)	25	14	11	11	10	7	7	8	
Software Service	28	38	39	41	46	50	55	60	9
Hardware Service	15	23	30	28	34	40	44	49	10
Service Revenue	43	61	69	68	80	91	99	109	9
Year-to-Year Increase (%)	12	41	14	-1	18	13	10	10	
Total Factory Revenue	922	1,017	1,136	1,240	1,429	1,582	1,689	1,805	10
Year-to-Year Increase (%)	17	10	12	9	15	11	7	7	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-12
CAD/CAM/CAE/GIS Software History and Forecast
Detail Europe Forecast, All Applications, Host/Proprietary

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	2,808	2,611	2,202	1,500	1,100	800	600	400	-28
Seats	12,734	8,740	7,527	5,700	4,400	3,100	2,300	1,700	-25
Year-to-Year Increase (%)	-12	-31	-14	-24	-24	-29	-26	-25	
Installed Base									
CPUs	15,966	15,432	14,398	12,700	11,300	10,400	10,000	9,500	-8
Seats	69,018	64,085	58,042	50,400	43,800	39,600	37,300	35,500	-9
Year-to-Year Increase (%)	-1	-7	-9	-13	-13	-10	-6	-5	
REVENUE DATA ($M)									
CPU Revenue	406	249	229	153	111	77	55	40	-29
Terminal Revenue	159	115	104	73	56	41	32	25	-25
Peripheral Revenue	23	12	9	4	2	1	0	0	-54
Hardware Revenue	589	375	342	230	169	119	88	66	-28
Year-to-Year Increase (%)	-24	-36	-9	-33	-26	-30	-26	-25	
Software Revenue	116	92	68	51	36	23	15	10	-32
Year-to-Year Increase (%)	-31	-21	-26	-25	-30	-35	-33	-34	
Software Service	31	33	41	25	19	14	10	7	-30
Hardware Service	145	79	72	44	31	20	14	10	-33
Service Revenue	176	112	113	69	50	34	24	16	-32
Year-to-Year Increase (%)	-32	-36	0	-38	-28	-32	-30	-30	
Total Factory Revenue	881	580	522	351	255	176	127	92	-29
Year-to-Year Increase (%)	-27	-34	-10	-33	-27	-31	-28	-27	

NA = Not applicable

Source: Dataquest (October 1995)

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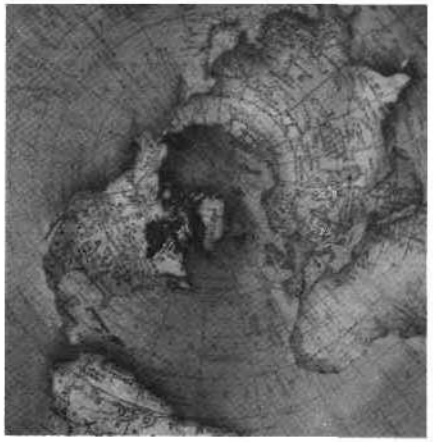
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CAD/CAM/CAE and GIS United Kingdom Forecast Update

Market Statistics

Program: CAD/CAM/CAE/GIS Europe
Product Code: CCAM-EU-MS-9512
Publication Date: December 4, 1995
Filing: Market Analysis

CAD/CAM/CAE and GIS United Kingdom Forecast Update



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Note: All tables show estimated data.

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CAD/CAM/CAE and GIS United Kingdom Forecast Update

Fluctuating exchange rates once again masked the true market performance in the 1994 CAD/CAM/CAE and GIS market. Japanese CAD/CAM/CAE and GIS total factory revenue grew 4.8 percent from 1993 to 1994 when measured in U.S. dollars, contrary to what would be expected given the country's prolonged recession. However, the dollar depreciated against the yen at a rate of 8.2 percent so that when measured in yen, Japanese CAD/CAM/CAE and GIS total factory revenue declined 3.8 percent from 1993 to 1994.

Less dramatically, European CAD/CAM/CAE and GIS total factory revenue grew 9.9 percent from 1993 to 1994 when measured in U.S. dollars. With the dollar depreciating 1.5 percent, European CAD/CAM/CAE and GIS total factory revenue grew a lower 8.2 percent from 1993 to 1994 when measured in ECU. Table 1 shows the impact of currency fluctuation on the CAD/CAM/CAE and GIS software market.

Looking ahead, currency fluctuations will continue to be felt in all global markets. The dollar has continued to weaken during the early months of this year so that if we were to assume a stable currency for the remainder of the year, 1995 would end with the dollar depreciating 4.2 percent against the yen and 7.8 percent against the ECU (see Table 2). Although Dataquest does not forecast currency exchange rates, we do forecast with the best information available. The exchange rate is calculated as the simple arithmetic mean of the 12 average monthly rates for each country. For the purpose of this forecast, Dataquest assumes the September exchange rate will remain stable in the future.

This document contains Dataquest's detailed forecast information for the CAD/CAM/CAE and GIS industry. Included are the following:

- Five-year historical data
- Five-year forecast data

More detailed data is available through Dataquest's Client Inquiry service, which can provide custom analysis of the multidimensional database.

Changes to Our Forecast Structure

Dataquest's CAD/CAM/CAE and GIS forecast is based upon the updated market share data gathered before the end of 1994 and updated throughout 1995. In order to better serve you, the new CAD/CAM/CAE and GIS database has been restructured as follows:

- Japan is now tracked as a region separate from Asia/Pacific.
- Asia/Pacific now includes China, Hong Kong, Korea, Singapore, Taiwan, and Rest of Asia (Australia, New Zealand, India, and Southeast Asia).

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Table 1
CAD/CAM/CAE and GIS Revenue Growth Comparison
(U.S. Dollars versus Local Currency for Both Europe and Japan)

Revenue by Region	1993	1994	Forecast 1999	Growth (%) 1993-1994	CAGR (%) 1994-1999
Europe ($M)					
Software Revenue	1,628.29	1,824.12	3,276.03	12.0	12.4
Hardware Revenue	2,421.88	2,604.55	5,022.05	7.5	14.0
Service Revenue	996.57	1,115.23	1,976.19	11.9	12.1
Total Factory Revenue	5,046.74	5,543.91	10,274.27	9.9	13.1
ECU/U.S.$ Exchange Rate*	0.86	0.84	0.77	-1.5	-1.8
Europe (ECU Millions)					
Software Revenue	1,394.80	1,538.83	2,522.54	10.3	10.4
Hardware Revenue	2,074.58	2,197.20	3,866.98	5.9	12.0
Service Revenue	853.67	940.81	1,521.67	10.2	10.1
Total Factory Revenue	4,323.04	4,676.84	7,911.19	8.2	11.1
Japan ($M)					
Software Revenue	1,203.33	1,315.70	2,013.89	9.3	8.9
Hardware Revenue	2,148.02	2,174.59	2,893.95	1.2	5.9
Service Revenue	756.90	813.74	1,074.17	7.5	5.7
Total Factory Revenue	4,108.24	4,304.03	5,982.01	4.8	6.8
Japan/U.S.$ Exchange Rate*	110.85	101.81	99.73	-8.2	-0.4
Japan (Yen Millions)					
Software Revenue	133,388.69	133,951.14	200,845.20	0.4	8.4
Hardware Revenue	238,107.55	221,394.71	288,613.32	-7.0	5.4
Service Revenue	83,902.25	82,847.36	107,126.86	-1.3	5.3
Total Factory Revenue	455,398.49	438,193.21	596,585.38	-3.8	6.4
North America ($M)					
Software Revenue	1,758.41	1,929.06	3,711.42	9.7	14.0
Hardware Revenue	2,345.76	2,512.99	4,526.12	7.1	12.5
Service Revenue	1,036.93	1,176.56	1,916.85	13.5	10.3
Total Factory Revenue	5,141.36	5,618.72	10,154.40	9.3	12.6
Worldwide ($M)					
Software Revenue	4,890.91	5,418.96	9,776.21	10.8	12.5
Hardware Revenue	7,351.48	7,798.97	13,510.08	6.1	11.6
Service Revenue	2,968.24	3,313.93	5,319.26	11.6	9.9
Total Factory Revenue	15,210.89	16,531.96	28,605.55	8.7	11.6

*Assuming a stable currency, the 1999 exchange rate is the September 1995 exchange rate.
Source: Dataquest (October 1995)

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Table 2
Foreign Currency versus the U.S. Dollar

		Actual					Current		Year-to-Year Change (%)					
Country	Currency	1990	1991	1992	1993	1994	1995	1996	1990-1991	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996
Austria	Schilling	11.36	11.67	10.95	11.65	11.40	10.32	10.05	2.73	-6.2	6.4	-2.1	-9.5	-2.6
Belgium	Franc	33.41	34.13	32.02	34.67	33.66	30.16	29.38	2.16	-6.2	8.3	-2.9	-10.4	-2.6
Denmark	Krone	6.18	6.39	6.02	6.49	6.35	5.70	5.54	3.40	-5.8	7.8	-2.2	-10.2	-2.8
Finland	Markka	3.82	4.04	4.45	5.73	5.21	4.39	4.27	5.76	10.1	28.8	-9.1	-15.7	-2.7
France	Franc	5.44	5.64	5.27	5.67	5.54	5.04	4.92	3.68	-6.6	7.6	-2.3	-9.0	-2.4
Germany	D-Mark	1.62	1.66	1.56	1.66	1.62	1.45	1.43	2.47	-6.0	6.4	-2.4	-10.8	-1.0
Italy	Lira	1,197.22	1,238.93	1,227.75	1,577.85	1,609.34	1,625.01	1,616.00	3.48	-0.9	28.5	2.0	1.0	-0.6
Netherlands	Guilder	1.82	1.87	1.75	1.86	1.82	1.64	1.64	2.75	-6.4	6.3	-2.2	-9.9	0.2
Norway	Krone	6.25	6.49	6.18	7.11	7.04	6.42	6.25	3.84	-4.8	15.0	-1.0	-8.8	-2.6
Spain	Peseta	102.03	103.81	101.90	127.87	133.48	125.35	123.48	1.74	-1.8	25.5	4.4	-6.1	-1.5
Sweden	Krona	5.92	6.04	5.81	7.82	7.70	7.30	6.95	2.03	-3.8	34.6	-1.5	-5.2	-4.8
Switzerland	Franc	1.39	1.43	1.40	1.48	1.37	1.20	1.16	2.88	-2.1	5.7	-7.4	-12.7	-3.0
United Kingdom	Pound	0.56	0.57	0.57	0.67	0.65	0.64	0.63	1.79	0	17.5	-3.0	-1.5	-1.6
Europe Average	ECU	0.79	0.81	0.77	0.86	0.84	0.78	0.77	2.27	-4.9	11.4	-1.5	-7.8	-1.0
China	Renminbi	4.79	5.33	5.51	5.76	8.54	8.32	8.32	11.27	3.4	4.5	48.3	-2.6	0
Hong Kong	Dollar	7.79	7.77	7.74	7.74	7.73	7.74	7.73	-0.26	-0.4	0	-0.1	0.1	-0.1
Japan	Yen	144.05	134.59	126.34	110.85	101.56	97.34	99.73	-6.57	-6.1	-12.3	-8.4	-4.2	2.5
Korea	Won	242.70	730.67	782.41	799.42	805.80	773.20	768.20	201.06	7.1	2.2	0.8	-4.0	-0.6
Singapore	Dollar	1.81	1.73	1.63	1.62	1.53	1.42	1.42	-4.42	-5.8	-0.9	-5.3	-7.2	0
Taiwan	Dollar	26.64	26.49	24.93	26.15	26.45	27.50	27.06	-0.56	-5.9	4.9	1.1	4.0	-1.6

Source: Dataquest (October 1995)

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- Service is divided into hardware service and software service.
- Platforms have been replaced by operating systems, to include UNIX, host, Windows NT and PC.

This restructuring is reflected in the forecast. The net result is a better history from which to forecast. Unfortunately, because of this restructuring, the data will not match the data in Dataquest's previously published market share documents. In addition to some shifting of revenue to allow for the restructuring, several company changes were made as follows:

- Work in the new database resulted in the loss of some companies' European and Asian revenue, most notably Altera. The revenue for these companies has been corrected and is available through your inquiry privilege.
- UniCAD had inadvertently been excluded from our market share database and was therefore not included in previously published market share documents. It has been added.
- Mentor Graphics restated its revenue for 1992 and 1993, correcting an error in its reporting by shifting revenue from the year of order to the year of sale and realigning its sales to our changed subapplication definitions.

Worldwide Forecast Assumptions

The following paragraphs describe the main forces driving the CAD/CAM/CAE and GIS worldwide software forecast.

Mechanical Forecast Assumptions

The mechanical CAD/CAM/CAE market, which grew 9.7 percent in 1994, is expected to reach a market size of $3.9 million in five years. The market will be fueled by a complex and rich blend of emerging technologies, regional growth, and new applications for CAD technology.

Emerging Technologies

Topping the list of emerging technologies is product data management. This market has clearly begun to take off, not only in Europe and the United States but in Japan and Korea as well. Within the past year, we have seen pilot programs begin to move to full-scale production, support for new client platforms (Windows NT, Windows), integration with materials resource planning (MRP) systems, and an emergence of a "lite" product data management (PDM) category. PDM will be one of the significant drivers of the mechanical CAD market through 1999. Farther down the road, we expect growth in the industry to come from other emerging technologies, including generative numerical control (NC) software, analysis, conceptual design, and simulation/optimization software.

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Regional Growth

The outlook for the European markets is brighter than it has been for the last few years. The European economy as a whole continues to emerge slowly from its recession, and many of the European industries have begun a major restructuring of their information technology (IT) investment. Tool purchases by automotive companies and their supplier bases will lead to higher growth for both software and hardware revenue in the mechanical CAD/CAM/CAE sector in Europe.

Mechanical CAD/CAM/CAE growth in Japan is expected to undergo a significant shift in platform usage over our forecast period. Currently, the UNIX platform dominates the mechanical sector in Japan, despite the fact the Japanese mechanical market still places a heavy emphasis on 2-D drafting instead of 3-D/solid modeling. We expect this drafting orientation to persist, and in the next five years we anticipate a significant shift to more Windows NT and PC-based operating systems, at the expense of UNIX. This shift will not begin in earnest until late 1996, when Japan-specific versions of mechanical software on Windows NT are more widely available.

New Applications for CAD Technology

In 1994, we saw the beginning of new applications for mechanical CAD technology. Growth is picking up in nontraditional industries (those industries outside of aerospace and automotive). We expect this trend to continue as mechanical modeling, analysis, design, and simulation software become more user-friendly. Closely linked to the use of mechanical CAD in new arenas is the availability of such software on lower-cost platforms like Windows NT and the use of object technology to create customized industry- or application-specific solutions.

AEC Forecast Assumptions

The Impact of Windows NT

Intergraph dominates the UNIX market in North America, and the company's shift to Windows NT will cause both the collapse of UNIX sales in North America and the gradual erosion of UNIX in Europe. Windows NT will get a boost in 1995, driven by frustrated PC users who demand high performance and who cannot wait for Windows 95 to solve their requirements.

Factors that should contribute to the long-term expansion of the AEC CAD market are as follows:

CAD Is Becoming a Business Requirement

Large design firms are growing at the expense of smaller firms. These large end users increasingly require their employees and suppliers to adopt automation tools in the design and construction process. Smaller design firms must increasingly buy CAD systems or risk being dropped from consideration as a partner.

CAD purchases are increasingly justified as a competitive advantage in both sales and design reviews. Electronic design data is also required

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downstream by the designer's client, from the federal government down to the small commercial developer. Also, a significant pool of untapped users still exists. The current relatively low market penetration of AEC CAD systems should allow steady worldwide growth during the next five years, despite constant volatility in demand for the buildings and infrastructure to be designed.

New Features in AEC CAD Products Are Achievable

Better, lower-cost visualization tools will be in increasing demand as sales and communication tools. Data and database functions (versus graphics functions) are increasing in importance in AEC design systems, creating opportunities to sell users significant new functionality. Some vendors will create products that foster communication in the entire design, construction, and maintenance process, products that will increase the payoff in CAD investments.

The following trends will inhibit growth in the AEC CAD industry:

Design Is Only Part of the Problem

AEC's one-design-one-build structure means CAD provides fewer economic benefits to these users than does the one-design-build-many structure of manufacturing. Construction, which is essentially a prototype build, is fraught with uncertainties and delays that are not well addressed by existing AEC systems. Design tools can only thrive in the AEC structure when they support more of the entire business problem.

Poor Cooperation among Users

Users are poorly organized to take advantage of improved products, partly because of competition between engineering constructors and partly because designs are often split among several different companies representing different and competing aspects of the design process. New approaches to the design and construction process are needed to allow users to take full advantage of CAD tools.

GIS/Mapping Forecast Assumptions

The Impact of Windows NT

Intergraph's move to Windows NT at the expense of UNIX will quickly make PC-based operating systems the dominant revenue stream in North America. In the long term, the GIS UNIX market is highly subject to erosion by Windows NT because of the appeal of better integration of GIS and Windows-based productivity tools.

Factors that should contribute to the long-term expansion of the GIS market are as follows:

There Exists an Abundant Supply of Prospective Buyers

Penetration is still moderately low among core users. Bread-and-butter prospects in government and utilities are charged with maintaining information on land and assets in perpetuity. Many of these prospective buyers are still using paper maps that will degrade over time. This creates a certain inevitability to moving from paper maps to computer-based systems.

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New Technologies Will Drive Growth

Faster, cheaper computers will be continually leveraged to support new software products. Widespread computer-industry developments in open, distributed systems supporting high-speed networking will make it possible for GIS technology to broadly expand its user base. Lower-cost, higher-resolution satellite imagery holds the potential to drive another explosion in GIS market growth among users who cannot afford aerial photography. Advances in aerial photography, global positioning systems (GPSs), and laser range finders are making it possible to create GISs significantly cheaper, more accurate, and more complete than existing paper maps, giving experienced users some compelling reasons to reinvest. Portable and pen-based computers are bringing GIS to new users in field operations.

Data Will Drive Growth

The GIS business market is driving high growth on PCs. However, we see a wide band of uncertainty surrounding the clearly growing revenue opportunity from new applications. Several new applications in GIS are destined to become relatively low-revenue producing features in other software programs (and market), rather than standalone products in the GIS market. At the same time, data is increasing in value relative to software in this low-end market.

GIS has attained a certain indispensability, particularly among federal users and in utilities. As a result, users are beginning to expect to share the data in their various GIS systems. Within three years, we expect data to be readily exchangeable across different systems. At that point, shareable data will help drive market growth.

Several factors seriously constrain the long-term expansion of the GIS market, as follows:

High Cost of Entry Remains a Barrier

There will remain an uncertain, but certainly high, cost of creating a working GIS system in traditional environments. No magic will emerge to create a low-cost, meaningful data set for mainstream customers in government and utilities. Data conversion will remain costly because the significant cost of correcting prior errors and omissions on paper maps is inevitably bundled into the cost of "conversion."

Price Pressures Inhibit Growth

Price pressure will hold down total revenue. Innovation is the only way to maintain prices in any software industry, and GIS vendors will struggle in their attempt to create compelling new applications and improved investment payoff for customers.

Electronic Design Automation

The EDA software market grew 16.8 percent in 1994. Over the next five years, growth will continue to be fueled by continually increasing design complexity and ever-higher speeds.

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Electronic CAE

The demands today's tools place on CPU processing speed and memory size are reversing the process of equalization and driving the sales of UNIX-class tools. Equalization (PC-based tools becoming more expensive as UNIX-based tools fall in price) was either caused by the stagnation of the design challenge or, more likely, the stagnation in tool development. Design complexity is forcing a large-scale swap: gate-level users are swapping up to registered transfer (RT)-level while RT-level users are swapping up to electronic system (ES)-level tools. RT-level tools will begin to appear on Windows NT, competing with the UNIX-based tools while the ES-level tools will remain UNIX-based. Meanwhile, low-end design—still manageable by PC-based tools—is shifting to Asia/Pacific and driving PC growth in that region. The main inhibitor to growth in CAE tools is the engineering learning curve.

IC Layout

The IC-layout market grew as expected, 20 percent from 1993 to 1994, after several very sleepy years. Design complexity and high speed is forcing replacement of obsolete tools, driving this high growth. This is primarily a replacement market of very high-cost tools and very few players. The ensuing frenzy for market share is the result. The few PC-based tools in this market are being replaced by UNIX-class tools in North America and Japan. Growth in the very few PC-based tools is in Europe (including eastern Europe) and Asia/Pacific. It is yet unclear whether Windows NT will be able to penetrate the IC Layout market.

PCB/MCM/Hybrid

The 3.3 percent growth in the printed circuit board (PCB) market comes as a surprise, given the forecast negative 2 percent growth from 1993 to 1994. The strong yen masked a decline in PCB growth (in yen) in Japan, where half of PCB sales are.

Organizational manufacturing models are driving changes in the PCB market. As manufacturing organizations are moving to Asia/Pacific (from both North America and Japan), the low-speed designing is following, driving PC sales in that region. In North America, Europe, and Japan, high-speed board design is moving from manufacturing into engineering departments that are traditionally UNIX-based. Where new engineering environments are being created for RT-level designs, the opportunity for Windows NT to take over both the CAE environment and the PCB environment exists.

Forecast Methodology

Fundamental to the way Dataquest conducts its research is the underlying philosophy that the best data and analyses come from a well-balanced program. This program includes the following: balance between primary and secondary collection techniques; balance between supply-side and demand-side analysis; balance between focused, industry-specific research and coordinated, "big-picture" analysis aided by integration of data from the more than 25 separate high-technology industries Dataquest covers; and balance between the perspectives of

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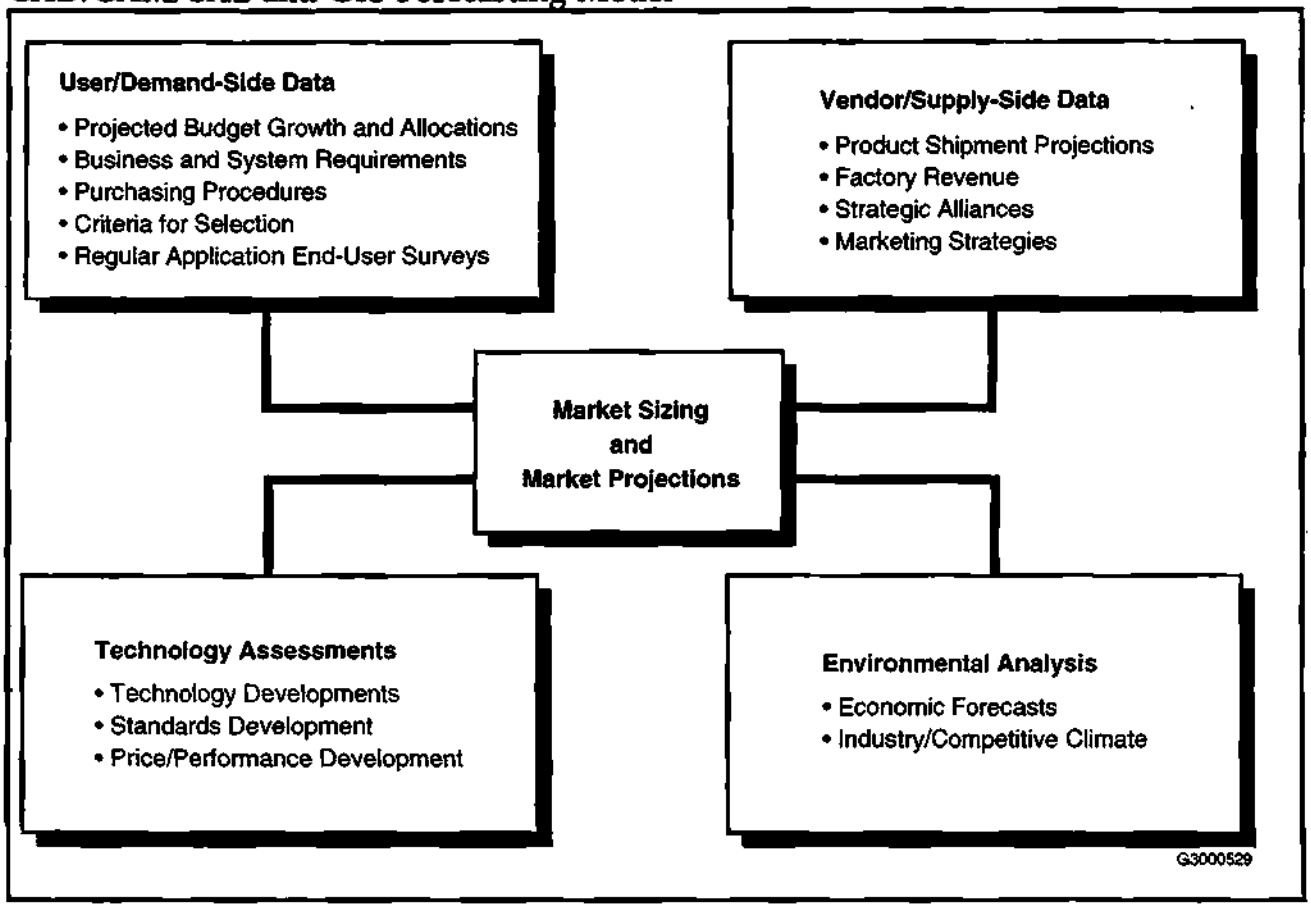
experienced industry professionals and rigorous, disciplined techniques of seasoned market researchers.

Dataquest also analyzes trends in the macro environment, which can have major influences on both supply-side and demand-side forecasting. In addition to demographics, analysts look at gross national product (GNP) growth, interest rate fluctuation, business expectations, and capital spending plans. In the geopolitical arena, the group looks at trade issues, political stability or lack thereof, tariffs, nontariff barriers, and such factors as the effect on Europe of the events of 1994.

Figure 1 shows the CAD/CAM/CAE and GIS forecasting model. The overall forecasting process uses a combination of techniques such as time series and technological modeling. Market estimates and forecasts are derived using the following research techniques:

- Segment forecasting—Individual forecasts are derived for each application segment tracked by the CAD/CAM/CAE and GIS group. Specifically, each application, segmented by region and platform, is forecast and rolled up. In this way, each application segment incorporates its own set of unique assumptions.

Figure 1
CAD/CAM/CAE and GIS Forecasting Model



Source: Dataquest (May 1995)

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- Demand-based analysis—Market growth is tracked and forecast in terms of the present and anticipated demand of current and future users. This requires the development of a total available market model and a satisfied available market figure to assess the levels of penetration accurately. Dataquest analysts also factor in the acceptance or ability for users to consume new technology.
- Capacity-based analysis—This method involves identifying future shipment volume constraints. These constraints, or "ceilings," can be the result of component availability, manufacturing capacity, or distribution capacity. In any case, capacity limitations are capable of keeping shipments below the demand level.

Segmentation Definitions

This section lists the definitions specific to this document. The following paragraphs define the segments.

Applications

- Mechanical—The mechanical segment refers to computer-aided tools used by engineers, designers, analysts, technicians, and draftspeople working predominantly in the discrete manufacturing industries, but includes government and education. Users of mechanical CAD/CAM/CAE tools work in all departments across the typical organization, with a majority found in product design, advanced engineering, and manufacturing engineering. Common design applications include conceptual design, industrial design, structural or thermal analysis, detail design, and electromechanical design (the mechanical part of design with electrical or electronic components and mechanisms). Common manufacturing applications include tool and fixture design, numerical control part programming, offline robotics programming, and interface to quality-control systems. Management tools for database control and distribution are included in this segment, as well as user-defined application programming.
- Architecture, Engineering, and Construction (AEC)—The AEC segment covers the use of computer-aided tools by architects, contractors, plant engineers, civil engineers, and other people associated with these disciplines to aid in designing and managing buildings, industrial plants, ships, and other types of nondiscrete entities.
- Geographic Information Systems (GIS)/Mapping—GIS is computer-based technology, and the segment is composed of hardware, software, and data used to capture, edit, display, and analyze spatial (tagged by location) information.
- Electronic Design Automation (EDA)—The EDA segment covers computer-based tools used to automate the process of designing an electronic product, including printed circuit boards, ICs, and systems. EDA includes ECAE, IC layout, and PCB/hybrid/MCM, as follows:
  - Electronic computer-aided engineering (ECAE)—These are computer-aided tools used in the engineering or design phase of electronic products (as opposed to the physical layout phase of the

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product). Examples of ECAE applications are schematic capture and simulation.

- IC layout—This is a software application tool used to create and validate the physical implementation of an IC. The IC layout category comprises polygon editors, symbolic editors, placement and routing (gate array, cell, and block), design verification tools (DRC/ERC/logic-to-layout), compilers, and module development tools.
- PCB/hybrid/MCM—This segment covers products used to create the placement and routing of the traces and components laid out on a printed circuit board. Also included in this category are thermal analysis tools.

Regions

The following bullets define the regions.

- North America—North America includes United States, Mexico, and Canada.
- Europe—Europe includes the United Kingdom, Scandinavia, Benelux, France, Germany, Italy, Spain, Austria/Switzerland, Russia, central Europe, and the rest of Europe.
- Japan
- Asia—Asia includes Singapore, Taiwan, Korea, China, Hong Kong, and the rest of Asia (Australia, India, and Southeast Asia).
- Rest of World—Rest of World includes all other countries and regions, including Africa, the Middle East, Central America, and South America.

Operating Systems

The following paragraphs define the operating systems.

UNIX. UNIX includes all UNIX variants and older workstation operating systems.

Host. Host includes minicomputer and mainframe operating systems in which external workstations' functions are dependent on a host computer.

Windows NT. Windows NT is the Microsoft operating system.

PC. PC includes DOS, Windows, Windows 95, OS/2, and Apple operating systems.

Line Items

Line item definitions are as follows:

- Average selling price (ASP) is defined as the average price of a product, inclusive of any discounts.
- CPU revenue is the portion of revenue derived from a system sale that is related to the value of the CPU.

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- CPU shipment is defined as the number of CPUs delivered.
- CPU installed base is defined as the total number of CPUs in active, day-to-day use.
- Unit shipment is defined as the number of products delivered (that is, seats).
- Seats are defined as the number of possible simultaneous users.
- Installed seats are defined as the total number of seats in active, day-to-day use.
- Hardware revenue is defined as the sum of the revenue from the hardware system components: CPU revenue, terminal revenue, and peripherals revenue.
- Peripherals revenue is defined as the value of all the peripherals from turnkey sale. (Peripherals in this category typically are input and output devices.)
- Terminal revenue is defined as revenue derived from the sale of terminals used to graphically create, analyze, or manipulate designs. The term is applicable only to the host systems.
- Software revenue is revenue derived from the sale of application software.
- Service revenue is defined as revenue derived from the service and support of CAD/CAM/CAE or GIS systems. Service is followed as software service and hardware service.
- Total factory revenue is defined as the amount of money received for goods measured in U.S. dollars and is the sum of hardware, software, and service revenue.

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Table A-1
CAD/CAM/CAE/GIS Software History and Forecast
Top Level Worldwide Forecast, All Applications, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
Software Revenue ($M)									
Worldwide, All Operating Systems	4,583	4,891	5,419	6,224	6,942	7,763	8,691	9,776	12.5
Worldwide									
UNIX	3,163	3,401	3,796	4,249	4,630	5,007	5,439	5,913	9.3
Windows NT	-	5	106	356	568	872	1,201	1,621	72.4
Personal Computer	1,066	1,190	1,327	1,484	1,652	1,827	2,012	2,214	10.8
Host/Proprietary	354	295	190	136	92	58	39	27	-32.1
All Operating Systems									
North America	1,599	1,759	1,929	2,170	2,480	2,863	3,279	3,711	14.0
Europe	1,668	1,628	1,824	2,178	2,410	2,650	2,926	3,276	12.4
Japan	1,117	1,203	1,316	1,445	1,563	1,694	1,840	2,014	8.9
Asia/Pacific	137	207	255	320	364	415	484	587	18.2
Rest of World	61	94	95	112	125	141	161	187	14.5
Year-to-Year Software Revenue Growth Rate (%)									
Worldwide, All Operating Systems		6.7	10.8	14.9	11.5	11.8	11.9	12.5	
Worldwide									
UNIX		7.5	11.6	11.9	9.0	8.1	8.6	8.7	
Windows NT		NA	1,950.4	234.2	59.8	53.4	37.8	35.0	
Personal Computer		11.6	11.5	11.8	11.3	10.6	10.1	10.1	
Host/Proprietary		-16.7	-35.6	-28.3	-32.5	-36.6	-32.2	-30.4	
All Operating Systems									
North America		10.0	9.7	12.5	14.3	15.5	14.5	13.2	
Europe		-2.4	12.0	19.4	10.7	10.0	10.4	12.0	
Japan		7.7	9.3	9.8	8.2	8.4	8.6	9.4	
Asia/Pacific		51.3	22.9	25.4	13.8	14.1	16.5	21.5	
Rest of World		53.2	1.7	17.7	11.5	12.6	14.6	16.3	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-1
CAD/CAM/CAE/GIS Software History and Forecast
Detail U.K. Forecast, All Applications, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	32,154	33,323	38,587	44,300	49,400	54,500	60,100	66,900	12
Seats	33,201	33,992	39,121	44,800	49,700	54,800	60,200	67,000	11
Year-to-Year Increase (%)	7	2	15	14	11	10	10	11	
Installed Base									
CPUs	132,938	146,048	162,802	180,800	199,400	218,300	234,400	248,300	9
Seats	141,124	152,684	167,982	184,700	202,500	221,000	236,900	250,700	8
Year-to-Year Increase (%)	13	8	10	10	10	9	7	6	
REVENUE DATA ($M)									
CPU Revenue	340	332	376	434	481	534	586	661	12
Terminal Revenue	21	17	14	10	8	6	4	3	-25
Peripheral Revenue	32	25	21	22	22	22	23	24	3
Hardware Revenue	393	374	411	466	510	561	613	688	11
Year-to-Year Increase (%)	-8	-5	10	13	10	10	9	12	
Software Revenue	250	249	288	339	375	415	458	516	12
Year-to-Year Increase (%)	1	0	16	18	11	10	11	13	
Software Service	76	87	106	127	138	147	157	168	10
Hardware Service	72	76	79	88	93	99	106	117	8
Service Revenue	148	163	185	215	231	246	263	284	9
Year-to-Year Increase (%)	3	10	13	16	8	7	7	8	
Total Factory Revenue	791	786	884	1,020	1,116	1,222	1,334	1,488	11
Year-to-Year Increase (%)	-3	-1	12	15	10	9	9	12	

NA = Not applicable

Source: Dataquest (October 1995)

Table B-2
CAD/CAM/CAE/GIS Software History and Forecast
Detail U.K. Forecast, Mechanical, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	14,164	14,373	16,117	18,900	20,800	22,400	23,900	25,500	10
Seats	14,875	14,881	16,544	19,300	21,100	22,600	24,100	25,600	9
Year-to-Year Increase (%)	8	0	11	17	9	7	6	6	
Installed Base									
CPUs	56,527	62,375	69,482	77,400	85,200	93,000	99,600	103,400	8
Seats	61,951	66,786	73,013	80,200	87,500	95,200	101,600	105,400	8
Year-to-Year Increase (%)	12	8	9	10	9	9	7	4	
REVENUE DATA ($M)									
CPU Revenue	171	164	187	222	241	258	273	290	9
Terminal Revenue	15	13	11	9	7	5	3	2	-26
Peripheral Revenue	18	9	7	7	7	7	6	6	-1
Hardware Revenue	203	186	205	238	255	269	283	299	8
Year-to-Year Increase (%)	-10	-8	10	16	7	6	5	6	
Software Revenue	122	123	143	173	189	205	220	235	11
Year-to-Year Increase (%)	0	1	16	21	10	8	7	7	
Software Service	38	46	58	72	78	81	83	85	8
Hardware Service	39	40	40	47	49	50	51	53	5
Service Revenue	77	86	99	119	127	131	134	137	7
Year-to-Year Increase (%)	-4	11	15	21	6	3	3	2	
Total Factory Revenue	402	395	447	530	571	604	636	672	8
Year-to-Year Increase (%)	-6	-2	13	19	8	6	5	6	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-3
CAD/CAM/CAE/GIS Software History and Forecast
Detail U.K. Forecast, AEC, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	10,137	10,092	10,651	11,700	12,700	13,600	14,400	15,400	8
Seats	10,249	10,171	10,696	11,700	12,700	13,600	14,400	15,400	8
Year-to-Year Increase (%)	11	-1	5	9	8	7	6	7	
Installed Base									
CPUs	40,052	43,946	47,621	50,600	53,200	55,200	56,200	56,300	3
Seats	40,957	44,667	48,155	51,000	53,500	55,400	56,500	56,500	3
Year-to-Year Increase (%)	16	9	8	6	5	4	2	0	
REVENUE DATA ($M)									
CPU Revenue	57	47	52	61	68	76	80	87	11
Terminal Revenue	2	1	1	0	0	0	0	0	-38
Peripheral Revenue	6	4	4	5	5	5	5	5	6
Hardware Revenue	65	52	57	66	74	82	86	93	10
Year-to-Year Increase (%)	-4	-19	9	16	11	11	5	8	
Software Revenue	43	38	41	47	51	54	58	62	8
Year-to-Year Increase (%)	0	-13	8	15	8	7	6	7	
Software Service	10	8	8	10	10	11	11	12	8
Hardware Service	8	7	8	9	9	10	11	12	8
Service Revenue	18	15	16	19	20	21	22	24	8
Year-to-Year Increase (%)	6	-18	13	13	6	7	6	7	
Total Factory Revenue	126	105	115	132	144	157	166	178	9
Year-to-Year Increase (%)	-1	-17	9	15	9	9	6	7	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-4
CAD/CAM/CAE/GIS Software History and Forecast
Detail U.K. Forecast, GIS/Mapping, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	3,925	4,722	6,124	7,200	8,500	10,000	11,800	13,800	18
Seats	4,110	4,807	6,181	7,300	8,500	10,000	11,800	13,800	18
Year-to-Year Increase (%)	20	17	29	17	17	18	18	17	
Installed Base									
CPUs	13,821	16,720	20,734	25,200	30,200	35,500	40,400	45,600	17
Seats	15,205	17,901	21,641	25,800	30,600	35,700	40,600	45,800	16
Year-to-Year Increase (%)	22	18	21	19	18	17	14	13	
REVENUE DATA ($M)									
CPU Revenue	56	69	78	86	94	109	123	142	13
Terminal Revenue	2	1	1	0	0	0	0	0	-69
Peripheral Revenue	8	11	9	10	9	9	10	10	1
Hardware Revenue	66	81	88	95	104	118	133	151	11
Year-to-Year Increase (%)	2	23	9	8	9	14	13	14	
Software Revenue	45	51	59	68	75	84	96	108	13
Year-to-Year Increase (%)	21	15	14	15	11	13	13	13	
Software Service	13	17	19	21	22	24	26	28	8
Hardware Service	13	17	19	19	20	22	24	27	7
Service Revenue	25	34	38	40	42	46	50	55	8
Year-to-Year Increase (%)	33	35	9	7	5	9	9	9	
Total Factory Revenue	136	166	184	203	221	248	279	314	11
Year-to-Year Increase (%)	13	22	11	10	9	13	12	13	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-5
CAD/CAM/CAE/GIS Software History and Forecast
Detail U.K. Forecast, Electronic Design Automation, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	3,928	4,137	5,695	6,500	7,400	8,500	9,900	12,100	16
Seats	3,968	4,132	5,700	6,500	7,500	8,600	9,900	12,200	16
Year-to-Year Increase (%)	-15	4	38	14	15	15	16	22	
Installed Base									
CPUs	22,538	23,007	24,966	27,600	30,800	34,600	38,200	42,900	11
Seats	23,011	23,330	25,172	27,700	30,900	34,700	38,300	43,000	11
Year-to-Year Increase (%)	3	1	8	10	11	12	10	12	
REVENUE DATA ($M)									
CPU Revenue	56	53	58	65	77	91	110	142	19
Terminal Revenue	2	1	1	1	1	1	1	1	-3
Peripheral Revenue	0	0	0	0	1	1	1	2	40
Hardware Revenue	59	54	60	66	78	93	111	145	19
Year-to-Year Increase (%)	-15	-8	10	11	18	19	20	30	
Software Revenue	40	37	46	52	61	71	86	111	19
Year-to-Year Increase (%)	-9	-6	22	13	17	18	20	30	
Software Service	15	16	21	24	27	31	36	43	16
Hardware Service	13	13	12	13	15	17	20	26	17
Service Revenue	28	29	32	37	42	48	56	68	16
Year-to-Year Increase (%)	1	2	13	14	14	15	16	22	
Total Factory Revenue	127	120	138	155	180	212	253	324	19
Year-to-Year Increase (%)	-10	-5	15	12	17	18	19	28	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-6
CAD/CAM/CAE/GIS Software History and Forecast
Detail U.K. Forecast, Electronic CAE, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	2,477	2,736	4,080	4,600	5,300	6,000	6,800	8,300	15
Seats	2,482	2,725	4,093	4,600	5,300	6,000	6,900	8,300	15
Year-to-Year Increase (%)	-15	10	50	14	14	13	15	22	
Installed Base									
CPUs	12,230	13,335	15,507	17,900	20,700	23,500	25,900	29,100	13
Seats	12,360	13,405	15,555	17,900	20,700	23,500	25,900	29,100	13
Year-to-Year Increase (%)	11	8	16	15	15	13	10	12	
REVENUE DATA ($M)									
CPU Revenue	36	36	40	45	53	63	75	98	20
Terminal Revenue	1	1	0	0	0	0	0	0	-9
Peripheral Revenue	0	0	0	0	0	0	0	1	46
Hardware Revenue	37	37	41	46	54	63	76	99	20
Year-to-Year Increase (%)	-5	0	10	13	18	17	19	31	
Software Revenue	25	26	32	36	42	49	59	78	20
Year-to-Year Increase (%)	2	2	24	13	17	17	20	32	
Software Service	9	10	13	15	17	19	22	26	15
Hardware Service	8	9	8	9	10	12	13	17	17
Service Revenue	17	19	21	24	27	31	35	43	16
Year-to-Year Increase (%)	15	8	12	14	16	13	15	22	
Total Factory Revenue	79	81	93	105	123	143	170	220	19
Year-to-Year Increase (%)	1	2	15	13	17	16	19	29	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-7
CAD/CAM/CAE/GIS Software History and Forecast
Detail U.K. Forecast, IC Layout, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	228	204	257	300	300	400	500	600	17
Seats	232	192	241	300	300	400	500	600	18
Year-to-Year Increase (%)	3	-17	25	18	19	19	18	17	
Installed Base									
CPUs	1,438	1,370	1,429	1,500	1,700	1,900	2,100	2,400	11
Seats	1,422	1,344	1,390	1,500	1,600	1,900	2,100	2,400	11
Year-to-Year Increase (%)	-3	-5	3	8	10	14	13	13	
REVENUE DATA ($M)									
CPU Revenue	9	7	8	8	10	11	14	16	14
Terminal Revenue	0	0	-	-	-	-	-	-	NA
Peripheral Revenue	0	-	0	0	0	0	0	0	2
Hardware Revenue	9	7	8	8	10	11	14	16	14
Year-to-Year Increase (%)	-2	-24	14	-1	20	20	18	17	
Software Revenue	6	4	5	6	8	9	11	12	19
Year-to-Year Increase (%)	7	-26	21	20	20	19	18	17	
Software Service	2	2	3	4	5	6	6	7	15
Hardware Service	2	2	2	2	2	3	3	3	11
Service Revenue	4	4	5	6	7	8	9	10	13
Year-to-Year Increase (%)	-6	-3	29	13	17	14	13	10	
Total Factory Revenue	19	16	19	20	24	29	33	38	15
Year-to-Year Increase (%)	0	-20	20	9	19	18	17	15	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-8
CAD/CAM/CAE/GIS Software History and Forecast
Detail U.K. Forecast, PCB/MCM/Hybrid, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	1,222	1,198	1,358	1,600	1,800	2,200	2,600	3,300	19
Seats	1,254	1,215	1,366	1,600	1,800	2,200	2,600	3,300	19
Year-to-Year Increase (%)	-19	-3	12	15	16	20	20	25	
Installed Base									
CPUs	8,869	8,302	8,030	8,100	8,400	9,200	10,200	11,400	7
Seats	9,229	8,581	8,226	8,300	8,500	9,300	10,200	11,500	7
Year-to-Year Increase (%)	-6	-7	-4	0	3	9	10	12	
REVENUE DATA ($M)									
CPU Revenue	12	10	10	12	14	17	21	29	22
Terminal Revenue	1	1	0	0	0	0	0	0	3
Peripheral Revenue	0	0	0	0	0	1	1	1	35
Hardware Revenue	13	10	11	12	14	18	22	30	22
Year-to-Year Increase (%)	-39	-21	7	12	15	26	24	36	
Software Revenue	9	8	9	10	11	14	16	21	19
Year-to-Year Increase (%)	-35	-15	19	12	12	21	21	29	
Software Service	4	4	4	5	5	6	7	10	17
Hardware Service	2	2	2	2	2	3	4	5	22
Service Revenue	6	6	6	7	8	9	11	15	19
Year-to-Year Increase (%)	-19	-10	7	13	8	20	21	33	
Total Factory Revenue	29	24	26	30	33	41	50	66	20
Year-to-Year Increase (%)	-34	-16	11	12	12	23	22	33	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-9
CAD/CAM/CAE/GIS Software History and Forecast
Detail U.K. Forecast, All Applications, UNIX

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	9,405	10,253	12,085	13,800	15,300	16,700	18,300	20,000	11
Seats	9,405	10,253	12,085	13,800	15,300	16,700	18,300	20,000	11
Year-to-Year Increase (%)	-8	9	18	14	11	9	10	9	
Installed Base									
CPUs	40,990	47,735	55,731	63,600	71,900	80,800	89,300	96,300	12
Seats	40,990	47,735	55,731	63,600	71,900	80,800	89,300	96,300	12
Year-to-Year Increase (%)	20	16	17	14	13	12	10	8	
REVENUE DATA ($M)									
CPU Revenue	219	230	257	299	329	357	389	422	10
Terminal Revenue	-	-	-	-	-	-	-	-	NA
Peripheral Revenue	27	21	15	14	13	12	11	10	-8
Hardware Revenue	246	251	272	313	342	369	399	432	10
Year-to-Year Increase (%)	-4	2	8	15	9	8	8	8	
Software Revenue	177	180	206	239	264	286	311	337	10
Year-to-Year Increase (%)	3	2	15	16	10	8	9	9	
Software Service	68	77	95	113	122	126	131	133	7
Hardware Service	55	62	60	71	76	79	83	87	8
Service Revenue	122	139	156	184	198	206	214	220	7
Year-to-Year Increase (%)	18	14	12	18	7	4	4	3	
Total Factory Revenue	546	570	633	736	803	860	924	989	9
Year-to-Year Increase (%)	3	5	11	16	9	7	7	7	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-10
CAD/CAM/CAE/GIS Software History and Forecast
Detail U.K. Forecast, All Applications, NT/Hybrid

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	-	9	410	1,400	1,800	2,600	3,400	5,000	65
Seats	-	9	410	1,400	1,800	2,600	3,400	5,000	65
Year-to-Year Increase (%)	NA	NA	4,560	233	32	42	33	45	
Installed Base									
CPUs	-	9	419	1,800	3,600	5,400	7,100	10,000	89
Seats	-	9	419	1,800	3,600	5,400	7,100	10,000	89
Year-to-Year Increase (%)	NA	NA	4,660	326	101	51	32	40	
REVENUE DATA ($M)									
CPU Revenue	-	0	5	22	28	44	62	98	80
Terminal Revenue	-	-	-	-	-	-	-	-	NA
Peripheral Revenue	-	0	1	3	3	4	5	6	52
Hardware Revenue	-	0	6	25	31	49	67	105	77
Year-to-Year Increase (%)	NA	NA	3,681	306	28	55	38	56	
Software Revenue	-	0	6	21	28	41	54	79	66
Year-to-Year Increase (%)	NA	NA	2,470	236	33	44	34	45	
Software Service	-	0	2	5	8	12	17	25	71
Hardware Service	-	0	3	5	7	10	14	20	48
Service Revenue	-	0	5	11	14	22	31	46	58
Year-to-Year Increase (%)	NA	NA	4,835	136	33	55	38	49	
Total Factory Revenue	-	0	17	57	74	112	152	229	68
Year-to-Year Increase (%)	NA	NA	3,300	234	31	51	36	51	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-11
CAD/CAM/CAE/GIS Software History and Forecast
Detail U.K. Forecast, All Applications, Personal Computer

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	22,283	22,658	25,722	28,900	32,100	35,100	38,200	41,800	10
Seats	22,283	22,658	25,723	28,900	32,100	35,100	38,200	41,800	10
Year-to-Year Increase (%)	19	2	14	12	11	10	9	9	
Installed Base									
CPUs	89,262	95,843	104,435	113,400	122,200	130,500	136,500	140,500	6
Seats	89,262	95,843	104,435	113,400	122,200	130,500	136,500	140,500	6
Year-to-Year Increase (%)	13	7	9	9	8	7	5	3	
REVENUE DATA ($M)									
CPU Revenue	69	64	79	89	106	120	127	134	11
Terminal Revenue	-	-	-	-	-	-	-	-	NA
Peripheral Revenue	3	2	4	5	6	6	7	7	12
Hardware Revenue	71	67	83	94	111	126	133	141	11
Year-to-Year Increase (%)	11	-6	25	12	19	13	6	6	
Software Revenue	56	58	68	73	80	86	92	99	8
Year-to-Year Increase (%)	22	4	17	8	9	8	7	7	
Software Service	5	7	5	6	7	7	8	9	10
Hardware Service	2	3	5	4	5	6	7	8	11
Service Revenue	7	10	10	10	12	14	15	16	11
Year-to-Year Increase (%)	71	41	-1	3	17	14	10	10	
Total Factory Revenue	134	134	161	177	203	226	240	257	10
Year-to-Year Increase (%)	18	0	20	10	15	11	6	7	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-12
CAD/CAM/CAE/GIS Software History and Forecast
Detail U.K. Forecast, All Applications, Host/Proprietary

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	467	403	370	300	200	100	100	100	-26
Seats	1,513	1,072	903	700	500	400	300	200	-26
Year-to-Year Increase (%)	-32	-29	-16	-21	-24	-30	-27	-26	
Installed Base									
CPUs	2,686	2,461	2,216	1,900	1,700	1,600	1,500	1,500	-7
Seats	10,873	9,098	7,396	5,900	4,700	4,200	4,000	3,900	-12
Year-to-Year Increase (%)	-11	-16	-19	-21	-19	-11	-5	-2	
REVENUE DATA ($M)									
CPU Revenue	52	38	35	24	17	12	9	6	-29
Terminal Revenue	21	17	14	10	8	6	4	3	-25
Peripheral Revenue	2	1	1	0	0	0	0	0	-54
Hardware Revenue	75	56	49	35	25	18	13	10	-28
Year-to-Year Increase (%)	-31	-26	-12	-30	-27	-30	-27	-26	
Software Revenue	17	11	8	6	4	3	2	1	-32
Year-to-Year Increase (%)	-40	-33	-28	-28	-30	-35	-33	-33	
Software Service	3	3	4	2	2	1	1	1	-29
Hardware Service	15	11	11	7	5	3	2	2	-33
Service Revenue	19	14	15	10	7	5	3	2	-32
Year-to-Year Increase (%)	-47	-26	6	-36	-29	-33	-30	-30	
Total Factory Revenue	111	81	72	50	36	25	18	13	-29
Year-to-Year Increase (%)	-36	-27	-11	-31	-28	-31	-28	-27	

NA = Not applicable

Source: Dataquest (October 1995)

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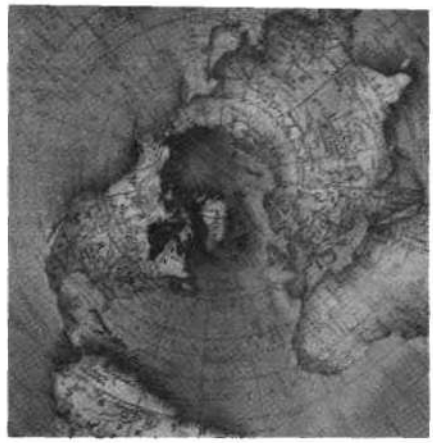
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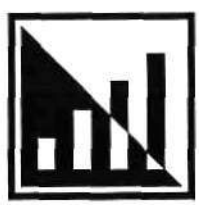
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CAD/CAM/CAE and GIS Rest of Europe Forecast Update



Market Statistics

Program: CAD/CAM/CAE/GIS Europe
Product Code: CCAM-EU-MS-9511
Publication Date: December 4, 1995
Filing: Market Analysis

CAD/CAM/CAE and GIS
Rest of Europe Forecast Update



Market Statistics

Program: CAD/CAM/CAE/GIS Europe
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Note: All tables show estimated data.

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Note: All tables show estimated data.

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CAD/CAM/CAE and GIS Rest of Europe Forecast Update

Fluctuating exchange rates once again masked the true market performance in the 1994 CAD/CAM/CAE and GIS market. Japanese CAD/CAM/CAE and GIS total factory revenue grew 4.8 percent from 1993 to 1994 when measured in U.S. dollars, contrary to what would be expected given the country's prolonged recession. However, the dollar depreciated against the yen at a rate of 8.2 percent so that when measured in yen, Japanese CAD/CAM/CAE and GIS total factory revenue declined 3.8 percent from 1993 to 1994.

Less dramatically, European CAD/CAM/CAE and GIS total factory revenue grew 9.9 percent from 1993 to 1994 when measured in U.S. dollars. With the dollar depreciating 1.5 percent, European CAD/CAM/CAE and GIS total factory revenue grew a lower 8.2 percent from 1993 to 1994 when measured in ECU. Table 1 shows the impact of currency fluctuation on the CAD/CAM/CAE and GIS software market.

Looking ahead, currency fluctuations will continue to be felt in all global markets. The dollar has continued to weaken during the early months of this year so that if we were to assume a stable currency for the remainder of the year, 1995 would end with the dollar depreciating 4.2 percent against the yen and 7.8 percent against the ECU (see Table 2). Although Dataquest does not forecast currency exchange rates, we do forecast with the best information available. The exchange rate is calculated as the simple arithmetic mean of the 12 average monthly rates for each country. For the purpose of this forecast, Dataquest assumes the September exchange rate will remain stable in the future.

This document contains Dataquest's detailed forecast information for the CAD/CAM/CAE and GIS industry. Included are the following:

- Five-year historical data
- Five-year forecast data

More detailed data is available through Dataquest's Client Inquiry service, which can provide custom analysis of the multidimensional database.

Changes to Our Forecast Structure

Dataquest's CAD/CAM/CAE and GIS forecast is based upon the updated market share data gathered before the end of 1994 and updated throughout 1995. In order to better serve you, the new CAD/CAM/CAE and GIS database has been restructured as follows:

- Japan is now tracked as a region separate from Asia/Pacific.
- Asia/Pacific now includes China, Hong Kong, Korea, Singapore, Taiwan, and Rest of Asia (Australia, New Zealand, India, and Southeast Asia).

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Table 1
CAD/CAM/CAE and GIS Revenue Growth Comparison
(U.S. Dollars versus Local Currency for Both Europe and Japan)

Revenue by Region	1993	1994	Forecast 1999	Growth (%) 1993-1994	CAGR (%) 1994-1999
Europe ($M)					
Software Revenue	1,628.29	1,824.12	3,276.03	12.0	12.4
Hardware Revenue	2,421.88	2,604.55	5,022.05	7.5	14.0
Service Revenue	996.57	1,115.23	1,976.19	11.9	12.1
Total Factory Revenue	5,046.74	5,543.91	10,274.27	9.9	13.1
ECU/U.S.$ Exchange Rate*	0.86	0.84	0.77	-1.5	-1.8
Europe (ECU Millions)					
Software Revenue	1,394.80	1,538.83	2,522.54	10.3	10.4
Hardware Revenue	2,074.58	2,197.20	3,866.98	5.9	12.0
Service Revenue	853.67	940.81	1,521.67	10.2	10.1
Total Factory Revenue	4,323.04	4,676.84	7,911.19	8.2	11.1
Japan ($M)					
Software Revenue	1,203.33	1,315.70	2,013.89	9.3	8.9
Hardware Revenue	2,148.02	2,174.59	2,893.95	1.2	5.9
Service Revenue	756.90	813.74	1,074.17	7.5	5.7
Total Factory Revenue	4,108.24	4,304.03	5,982.01	4.8	6.8
Japan/U.S.$ Exchange Rate*	110.85	101.81	99.73	-8.2	-0.4
Japan (Yen Millions)					
Software Revenue	133,388.69	133,951.14	200,845.20	0.4	8.4
Hardware Revenue	238,107.55	221,394.71	288,613.32	-7.0	5.4
Service Revenue	83,902.25	82,847.36	107,126.86	-1.3	5.3
Total Factory Revenue	455,398.49	438,193.21	596,585.38	-3.8	6.4
North America ($M)					
Software Revenue	1,758.41	1,929.06	3,711.42	9.7	14.0
Hardware Revenue	2,345.76	2,512.99	4,526.12	7.1	12.5
Service Revenue	1,036.93	1,176.56	1,916.85	13.5	10.3
Total Factory Revenue	5,141.36	5,618.72	10,154.40	9.3	12.6
Worldwide ($M)					
Software Revenue	4,890.91	5,418.96	9,776.21	10.8	12.5
Hardware Revenue	7,351.48	7,798.97	13,510.08	6.1	11.6
Service Revenue	2,968.24	3,313.93	5,319.26	11.6	9.9
Total Factory Revenue	15,210.89	16,531.96	28,605.55	8.7	11.6

*Assuming a stable currency, the 1999 exchange rate is the September 1995 exchange rate.
Source: Dataquest (October 1995)

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Table 2
Foreign Currency versus the U.S. Dollar

		Actual				Current			Year-to-Year Change (%)					
Country	Currency	1990	1991	1992	1993	1994	1995	1996	1990-1991	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996
Austria	Schilling	11.36	11.67	10.95	11.65	11.40	10.32	10.05	2.73	-6.2	6.4	-2.1	-9.5	-2.6
Belgium	Franc	33.41	34.13	32.02	34.67	33.66	30.16	29.38	2.16	-6.2	8.3	-2.9	-10.4	-2.6
Denmark	Krone	6.18	6.39	6.02	6.49	6.35	5.70	5.54	3.40	-5.8	7.8	-2.2	-10.2	-2.8
Finland	Markka	3.82	4.04	4.45	5.73	5.21	4.39	4.27	5.76	10.1	28.8	-9.1	-15.7	-2.7
France	Franc	5.44	5.64	5.27	5.67	5.54	5.04	4.92	3.68	-6.6	7.6	-2.3	-9.0	-2.4
Germany	D-Mark	1.62	1.66	1.56	1.66	1.62	1.45	1.43	2.47	-6.0	6.4	-2.4	-10.8	-1.0
Italy	Lira	1,197.22	1,238.93	1,227.75	1,577.85	1,609.34	1,625.01	1,616.00	3.48	-0.9	28.5	2.0	1.0	-0.6
Netherlands	Guilder	1.82	1.87	1.75	1.86	1.82	1.64	1.64	2.75	-6.4	6.3	-2.2	-9.9	0.2
Norway	Krone	6.25	6.49	6.18	7.11	7.04	6.42	6.25	3.84	-4.8	15.0	-1.0	-8.8	-2.6
Spain	Peseta	102.03	103.81	101.90	127.87	133.48	125.35	123.48	1.74	-1.8	25.5	4.4	-6.1	-1.5
Sweden	Krona	5.92	6.04	5.81	7.82	7.70	7.30	6.95	2.03	-3.8	34.6	-1.5	-5.2	-4.8
Switzerland	Franc	1.39	1.43	1.40	1.48	1.37	1.20	1.16	2.88	-2.1	5.7	-7.4	-12.7	-3.0
United Kingdom	Pound	0.56	0.57	0.57	0.67	0.65	0.64	0.63	1.79	0	17.5	-3.0	-1.5	-1.6
Europe Average	ECU	0.79	0.81	0.77	0.86	0.84	0.78	0.77	2.27	-4.9	11.4	-1.5	-7.8	-1.0
China	Renminbi	4.79	5.33	5.51	5.76	8.54	8.32	8.32	11.27	3.4	4.5	48.3	-2.6	0
Hong Kong	Dollar	7.79	7.77	7.74	7.74	7.73	7.74	7.73	-0.26	-0.4	0	-0.1	0.1	-0.1
Japan	Yen	144.05	134.59	126.34	110.85	101.56	97.34	99.73	-6.57	-6.1	-12.3	-8.4	-4.2	2.5
Korea	Won	242.70	730.67	782.41	799.42	805.80	773.20	768.20	201.06	7.1	2.2	0.8	-4.0	-0.6
Singapore	Dollar	1.81	1.73	1.63	1.62	1.53	1.42	1.42	-4.42	-5.8	-0.9	-5.3	-7.2	0
Taiwan	Dollar	26.64	26.49	24.93	26.15	26.45	27.50	27.06	-0.56	-5.9	4.9	1.1	4.0	-1.6

Source: Dataquest (October 1995)

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- Service is divided into hardware service and software service.
- Platforms have been replaced by operating systems, to include UNIX, host, Windows NT and PC.

This restructuring is reflected in the forecast. The net result is a better history from which to forecast. Unfortunately, because of this restructuring, the data will not match the data in Dataquest's previously published market share documents. In addition to some shifting of revenue to allow for the restructuring, several company changes were made as follows:

- Work in the new database resulted in the loss of some companies' European and Asian revenue, most notably Altera. The revenue for these companies has been corrected and is available through your inquiry privilege.
- UniCAD had inadvertently been excluded from our market share database and was therefore not included in previously published market share documents. It has been added.
- Mentor Graphics restated its revenue for 1992 and 1993, correcting an error in its reporting by shifting revenue from the year of order to the year of sale and realigning its sales to our changed subapplication definitions.

Worldwide Forecast Assumptions

The following paragraphs describe the main forces driving the CAD/CAM/CAE and GIS worldwide software forecast.

Mechanical Forecast Assumptions

The mechanical CAD/CAM/CAE market, which grew 9.7 percent in 1994, is expected to reach a market size of $3.9 million in five years. The market will be fueled by a complex and rich blend of emerging technologies, regional growth, and new applications for CAD technology.

Emerging Technologies

Topping the list of emerging technologies is product data management. This market has clearly begun to take off, not only in Europe and the United States but in Japan and Korea as well. Within the past year, we have seen pilot programs begin to move to full-scale production, support for new client platforms (Windows NT, Windows), integration with materials resource planning (MRP) systems, and an emergence of a "lite" product data management (PDM) category. PDM will be one of the significant drivers of the mechanical CAD market through 1999. Farther down the road, we expect growth in the industry to come from other emerging technologies, including generative numerical control (NC) software, analysis, conceptual design, and simulation/optimization software.

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Regional Growth

The outlook for the European markets is brighter than it has been for the last few years. The European economy as a whole continues to emerge slowly from its recession, and many of the European industries have begun a major restructuring of their information technology (IT) investment. Tool purchases by automotive companies and their supplier bases will lead to higher growth for both software and hardware revenue in the mechanical CAD/CAM/CAE sector in Europe.

Mechanical CAD/CAM/CAE growth in Japan is expected to undergo a significant shift in platform usage over our forecast period. Currently, the UNIX platform dominates the mechanical sector in Japan, despite the fact the Japanese mechanical market still places a heavy emphasis on 2-D drafting instead of 3-D/solid modeling. We expect this drafting orientation to persist, and in the next five years we anticipate a significant shift to more Windows NT and PC-based operating systems, at the expense of UNIX. This shift will not begin in earnest until late 1996, when Japan-specific versions of mechanical software on Windows NT are more widely available.

New Applications for CAD Technology

In 1994, we saw the beginning of new applications for mechanical CAD technology. Growth is picking up in nontraditional industries (those industries outside of aerospace and automotive). We expect this trend to continue as mechanical modeling, analysis, design, and simulation software become more user-friendly. Closely linked to the use of mechanical CAD in new arenas is the availability of such software on lower-cost platforms like Windows NT and the use of object technology to create customized industry- or application-specific solutions.

AEC Forecast Assumptions

The Impact of Windows NT

Intergraph dominates the UNIX market in North America, and the company's shift to Windows NT will cause both the collapse of UNIX sales in North America and the gradual erosion of UNIX in Europe. Windows NT will get a boost in 1995, driven by frustrated PC users who demand high performance and who cannot wait for Windows 95 to solve their requirements.

Factors that should contribute to the long-term expansion of the AEC CAD market are as follows:

CAD Is Becoming a Business Requirement

Large design firms are growing at the expense of smaller firms. These large end users increasingly require their employees and suppliers to adopt automation tools in the design and construction process. Smaller design firms must increasingly buy CAD systems or risk being dropped from consideration as a partner.

CAD purchases are increasingly justified as a competitive advantage in both sales and design reviews. Electronic design data is also required

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downstream by the designer's client, from the federal government down to the small commercial developer. Also, a significant pool of untapped users still exists. The current relatively low market penetration of AEC CAD systems should allow steady worldwide growth during the next five years, despite constant volatility in demand for the buildings and infrastructure to be designed.

New Features In AEC CAD Products Are Achievable

Better, lower-cost visualization tools will be in increasing demand as sales and communication tools. Data and database functions (versus graphics functions) are increasing in importance in AEC design systems, creating opportunities to sell users significant new functionality. Some vendors will create products that foster communication in the entire design, construction, and maintenance process, products that will increase the payoff in CAD investments.

The following trends will inhibit growth in the AEC CAD industry:

Design Is Only Part of the Problem

AEC's one-design-one-build structure means CAD provides fewer economic benefits to these users than does the one-design-build-many structure of manufacturing. Construction, which is essentially a prototype build, is fraught with uncertainties and delays that are not well addressed by existing AEC systems. Design tools can only thrive in the AEC structure when they support more of the entire business problem.

Poor Cooperation among Users

Users are poorly organized to take advantage of improved products, partly because of competition between engineering constructors and partly because designs are often split among several different companies representing different and competing aspects of the design process. New approaches to the design and construction process are needed to allow users to take full advantage of CAD tools.

GIS/Mapping Forecast Assumptions

The Impact of Windows NT

Intergraph's move to Windows NT at the expense of UNIX will quickly make PC-based operating systems the dominant revenue stream in North America. In the long term, the GIS UNIX market is highly subject to erosion by Windows NT because of the appeal of better integration of GIS and Windows-based productivity tools.

Factors that should contribute to the long-term expansion of the GIS market are as follows:

There Exists an Abundant Supply of Prospective Buyers

Penetration is still moderately low among core users. Bread-and-butter prospects in government and utilities are charged with maintaining information on land and assets in perpetuity. Many of these prospective buyers are still using paper maps that will degrade over time. This creates a certain inevitability to moving from paper maps to computer-based systems.

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New Technologies Will Drive Growth

Faster, cheaper computers will be continually leveraged to support new software products. Widespread computer-industry developments in open, distributed systems supporting high-speed networking will make it possible for GIS technology to broadly expand its user base. Lower-cost, higher-resolution satellite imagery holds the potential to drive another explosion in GIS market growth among users who cannot afford aerial photography. Advances in aerial photography, global positioning systems (GPSs), and laser range finders are making it possible to create GISs significantly cheaper, more accurate, and more complete than existing paper maps, giving experienced users some compelling reasons to reinvest. Portable and pen-based computers are bringing GIS to new users in field operations.

Data Will Drive Growth

The GIS business market is driving high growth on PCs. However, we see a wide band of uncertainty surrounding the clearly growing revenue opportunity from new applications. Several new applications in GIS are destined to become relatively low-revenue producing features in other software programs (and market), rather than standalone products in the GIS market. At the same time, data is increasing in value relative to software in this low-end market.

GIS has attained a certain indispensability, particularly among federal users and in utilities. As a result, users are beginning to expect to share the data in their various GIS systems. Within three years, we expect data to be readily exchangeable across different systems. At that point, shareable data will help drive market growth.

Several factors seriously constrain the long-term expansion of the GIS market, as follows:

High Cost of Entry Remains a Barrier

There will remain an uncertain, but certainly high, cost of creating a working GIS system in traditional environments. No magic will emerge to create a low-cost, meaningful data set for mainstream customers in government and utilities. Data conversion will remain costly because the significant cost of correcting prior errors and omissions on paper maps is inevitably bundled into the cost of "conversion."

Price Pressures Inhibit Growth

Price pressure will hold down total revenue. Innovation is the only way to maintain prices in any software industry, and GIS vendors will struggle in their attempt to create compelling new applications and improved investment payoff for customers.

Electronic Design Automation

The EDA software market grew 16.8 percent in 1994. Over the next five years, growth will continue to be fueled by continually increasing design complexity and ever-higher speeds.

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Electronic CAE

The demands today's tools place on CPU processing speed and memory size are reversing the process of equalization and driving the sales of UNIX-class tools. Equalization (PC-based tools becoming more expensive as UNIX-based tools fall in price) was either caused by the stagnation of the design challenge or, more likely, the stagnation in tool development. Design complexity is forcing a large-scale swap: gate-level users are swapping up to registered transfer (RT)-level while RT-level users are swapping up to electronic system (ES)-level tools. RT-level tools will begin to appear on Windows NT, competing with the UNIX-based tools while the ES-level tools will remain UNIX-based. Meanwhile, low-end design—still manageable by PC-based tools—is shifting to Asia/Pacific and driving PC growth in that region. The main inhibitor to growth in CAE tools is the engineering learning curve.

IC Layout

The IC-layout market grew as expected, 20 percent from 1993 to 1994, after several very sleepy years. Design complexity and high speed is forcing replacement of obsolete tools, driving this high growth. This is primarily a replacement market of very high-cost tools and very few players. The ensuing frenzy for market share is the result. The few PC-based tools in this market are being replaced by UNIX-class tools in North America and Japan. Growth in the very few PC-based tools is in Europe (including eastern Europe) and Asia/Pacific. It is yet unclear whether Windows NT will be able to penetrate the IC Layout market.

PCB/MCM/Hybrid

The 3.3 percent growth in the printed circuit board (PCB) market comes as a surprise, given the forecast negative 2 percent growth from 1993 to 1994. The strong yen masked a decline in PCB growth (in yen) in Japan, where half of PCB sales are.

Organizational manufacturing models are driving changes in the PCB market. As manufacturing organizations are moving to Asia/Pacific (from both North America and Japan), the low-speed designing is following, driving PC sales in that region. In North America, Europe, and Japan, high-speed board design is moving from manufacturing into engineering departments that are traditionally UNIX-based. Where new engineering environments are being created for RT-level designs, the opportunity for Windows NT to take over both the CAE environment and the PCB environment exists.

Forecast Methodology

Fundamental to the way Dataquest conducts its research is the underlying philosophy that the best data and analyses come from a well-balanced program. This program includes the following: balance between primary and secondary collection techniques; balance between supply-side and demand-side analysis; balance between focused, industry-specific research and coordinated, "big-picture" analysis aided by integration of data from the more than 25 separate high-technology industries Dataquest covers; and balance between the perspectives of

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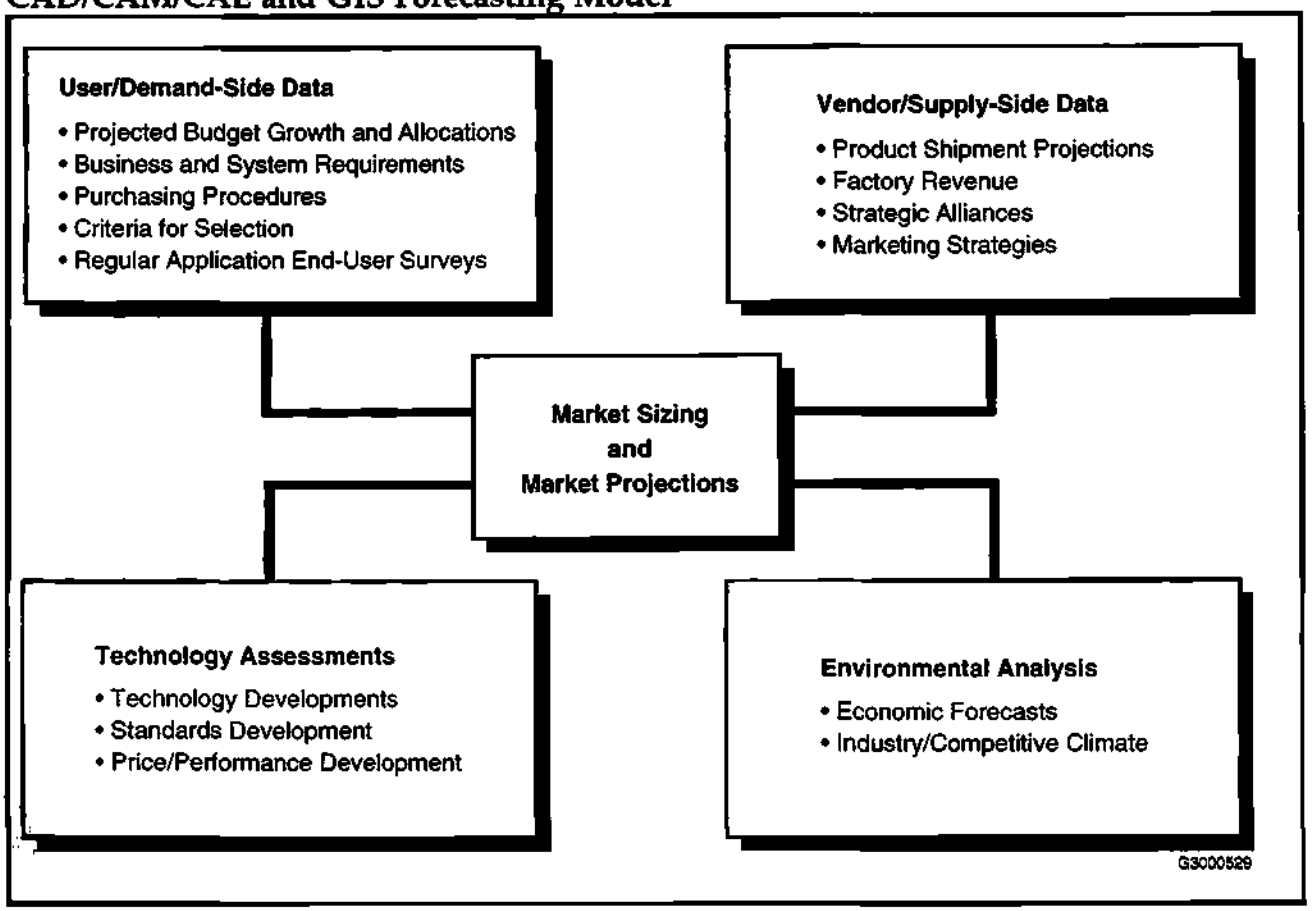
experienced industry professionals and rigorous, disciplined techniques of seasoned market researchers.

Dataquest also analyzes trends in the macro environment, which can have major influences on both supply-side and demand-side forecasting. In addition to demographics, analysts look at gross national product (GNP) growth, interest rate fluctuation, business expectations, and capital spending plans. In the geopolitical arena, the group looks at trade issues, political stability or lack thereof, tariffs, nontariff barriers, and such factors as the effect on Europe of the events of 1994.

Figure 1 shows the CAD/CAM/CAE and GIS forecasting model. The overall forecasting process uses a combination of techniques such as time series and technological modeling. Market estimates and forecasts are derived using the following research techniques:

- Segment forecasting—Individual forecasts are derived for each application segment tracked by the CAD/CAM/CAE and GIS group. Specifically, each application, segmented by region and platform, is forecast and rolled up. In this way, each application segment incorporates its own set of unique assumptions.

Figure 1
CAD/CAM/CAE and GIS Forecasting Model



Source: Dataquest (May 1995)

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- Demand-based analysis—Market growth is tracked and forecast in terms of the present and anticipated demand of current and future users. This requires the development of a total available market model and a satisfied available market figure to assess the levels of penetration accurately. Dataquest analysts also factor in the acceptance or ability for users to consume new technology.
- Capacity-based analysis—This method involves identifying future shipment volume constraints. These constraints, or "ceilings," can be the result of component availability, manufacturing capacity, or distribution capacity. In any case, capacity limitations are capable of keeping shipments below the demand level.

Segmentation Definitions

This section lists the definitions specific to this document. The following paragraphs define the segments.

Applications

- Mechanical—The mechanical segment refers to computer-aided tools used by engineers, designers, analysts, technicians, and draftspeople working predominantly in the discrete manufacturing industries, but includes government and education. Users of mechanical CAD/CAM/CAE tools work in all departments across the typical organization, with a majority found in product design, advanced engineering, and manufacturing engineering. Common design applications include conceptual design, industrial design, structural or thermal analysis, detail design, and electromechanical design (the mechanical part of design with electrical or electronic components and mechanisms). Common manufacturing applications include tool and fixture design, numerical control part programming, offline robotics programming, and interface to quality-control systems. Management tools for database control and distribution are included in this segment, as well as user-defined application programming.
- Architecture, Engineering, and Construction (AEC)—The AEC segment covers the use of computer-aided tools by architects, contractors, plant engineers, civil engineers, and other people associated with these disciplines to aid in designing and managing buildings, industrial plants, ships, and other types of nondiscrete entities.
- Geographic Information Systems (GIS)/Mapping—GIS is computer-based technology, and the segment is composed of hardware, software, and data used to capture, edit, display, and analyze spatial (tagged by location) information.
- Electronic Design Automation (EDA)—The EDA segment covers computer-based tools used to automate the process of designing an electronic product, including printed circuit boards, ICs, and systems. EDA includes ECAE, IC layout, and PCB/hybrid/MCM, as follows:
  - Electronic computer-aided engineering (ECAE)—These are computer-aided tools used in the engineering or design phase of electronic products (as opposed to the physical layout phase of the

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product). Examples of ECAE applications are schematic capture and simulation.

- IC layout—This is a software application tool used to create and validate the physical implementation of an IC. The IC layout category comprises polygon editors, symbolic editors, placement and routing (gate array, cell, and block), design verification tools (DRC/ERC/logic-to-layout), compilers, and module development tools.
- PCB/hybrid/MCM—This segment covers products used to create the placement and routing of the traces and components laid out on a printed circuit board. Also included in this category are thermal analysis tools.

Regions

The following bullets define the regions.

- North America—North America includes United States, Mexico, and Canada.
- Europe—Europe includes the United Kingdom, Scandinavia, Benelux, France, Germany, Italy, Spain, Austria/Switzerland, Russia, central Europe, and the rest of Europe.
- Japan
- Asia—Asia includes Singapore, Taiwan, Korea, China, Hong Kong, and the rest of Asia (Australia, India, and Southeast Asia).
- Rest of World—Rest of World includes all other countries and regions, including Africa, the Middle East, Central America, and South America.

Operating Systems

The following paragraphs define the operating systems.

UNIX. UNIX includes all UNIX variants and older workstation operating systems.

Host. Host includes minicomputer and mainframe operating systems in which external workstations' functions are dependent on a host computer.

Windows NT. Windows NT is the Microsoft operating system.

PC. PC includes DOS, Windows, Windows 95, OS/2, and Apple operating systems.

Line Items

Line item definitions are as follows:

- Average selling price (ASP) is defined as the average price of a product, inclusive of any discounts.
- CPU revenue is the portion of revenue derived from a system sale that is related to the value of the CPU.

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- CPU shipment is defined as the number of CPUs delivered.
- CPU installed base is defined as the total number of CPUs in active, day-to-day use.
- Unit shipment is defined as the number of products delivered (that is, seats).
- Seats are defined as the number of possible simultaneous users.
- Installed seats are defined as the total number of seats in active, day-to-day use.
- Hardware revenue is defined as the sum of the revenue from the hardware system components: CPU revenue, terminal revenue, and peripherals revenue.
- Peripherals revenue is defined as the value of all the peripherals from turnkey sale. (Peripherals in this category typically are input and output devices.)
- Terminal revenue is defined as revenue derived from the sale of terminals used to graphically create, analyze, or manipulate designs. The term is applicable only to the host systems.
- Software revenue is revenue derived from the sale of application software.
- Service revenue is defined as revenue derived from the service and support of CAD/CAM/CAE or GIS systems. Service is followed as software service and hardware service.
- Total factory revenue is defined as the amount of money received for goods measured in U.S. dollars and is the sum of hardware, software, and service revenue.

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Table A-1
CAD/CAM/CAE/GIS Software History and Forecast
Top Level Worldwide Forecast, All Applications, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
Software Revenue ($M)									
Worldwide, All Operating Systems	4,583	4,891	5,419	6,224	6,942	7,763	8,691	9,776	12.5
Worldwide									
UNIX	3,163	3,401	3,796	4,249	4,630	5,007	5,439	5,913	9.3
Windows NT	-	5	106	356	568	872	1,201	1,621	72.4
Personal Computer	1,066	1,190	1,327	1,484	1,652	1,827	2,012	2,214	10.8
Host/Proprietary	354	295	190	136	92	58	39	27	-32.1
All Operating Systems									
North America	1,599	1,759	1,929	2,170	2,480	2,863	3,279	3,711	14.0
Europe	1,668	1,628	1,824	2,178	2,410	2,650	2,926	3,276	12.4
Japan	1,117	1,203	1,316	1,445	1,563	1,694	1,840	2,014	8.9
Asia/Pacific	137	207	255	320	364	415	484	587	18.2
Rest of World	61	94	95	112	125	141	161	187	14.5
Year-to-Year Software Revenue Growth Rate (%)									
Worldwide, All Operating Systems		6.7	10.8	14.9	11.5	11.8	11.9	12.5	
Worldwide									
UNIX		7.5	11.6	11.9	9.0	8.1	8.6	8.7	
Windows NT		NA	1,950.4	234.2	59.8	53.4	37.8	35.0	
Personal Computer		11.6	11.5	11.8	11.3	10.6	10.1	10.1	
Host/Proprietary		-16.7	-35.6	-28.3	-32.5	-36.6	-32.2	-30.4	
All Operating Systems									
North America		10.0	9.7	12.5	14.3	15.5	14.5	13.2	
Europe		-2.4	12.0	19.4	10.7	10.0	10.4	12.0	
Japan		7.7	9.3	9.8	8.2	8.4	8.6	9.4	
Asia/Pacific		51.3	22.9	25.4	13.8	14.1	16.5	21.5	
Rest of World		53.2	1.7	17.7	11.5	12.6	14.6	16.3	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-1
CAD/CAM/CAE/GIS Software History and Forecast
Detail Benelux Forecast, All Applications, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	10,858	12,361	14,432	16,900	18,800	20,900	23,200	26,100	13
Seats	11,272	12,559	14,584	17,000	18,900	20,900	23,300	26,200	12
Year-to-Year Increase (%)	8	11	16	17	11	11	11	13	
Installed Base									
CPUs	39,614	46,747	55,308	64,300	72,900	80,900	87,200	93,100	11
Seats	42,949	49,346	57,228	65,600	73,900	81,700	87,900	93,900	10
Year-to-Year Increase (%)	17	15	16	15	13	11	8	7	
REVENUE DATA ($M)									
CPU Revenue	119	115	130	150	164	183	203	235	13
Terminal Revenue	9	6	5	3	3	2	1	1	-27
Peripheral Revenue	12	6	6	7	7	7	7	8	6
Hardware Revenue	140	127	141	160	174	193	212	244	12
Year-to-Year Increase (%)	-8	-10	11	14	8	11	10	15	
Software Revenue	77	82	95	114	125	140	156	177	13
Year-to-Year Increase (%)	5	6	16	20	10	11	12	14	
Software Service	21	21	28	33	36	39	43	47	11
Hardware Service	26	26	27	30	31	33	35	40	8
Service Revenue	47	47	56	63	67	72	78	87	9
Year-to-Year Increase (%)	-3	1	17	13	6	8	8	11	
Total Factory Revenue	265	256	291	337	366	404	446	507	12
Year-to-Year Increase (%)	-4	-3	14	16	8	10	10	14	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-2
CAD/CAM/CAE/GIS Software History and Forecast
Detail Benelux Forecast, Mechanical, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	3,829	4,106	4,854	5,700	6,200	6,700	7,300	7,800	10
Seats	4,125	4,234	4,975	5,900	6,300	6,800	7,300	7,800	9
Year-to-Year Increase (%)	-4	3	17	18	8	8	7	7	
Installed Base									
CPUs	15,565	17,412	19,887	22,700	25,300	27,800	29,700	31,100	9
Seats	18,035	19,303	21,283	23,700	26,000	28,400	30,300	31,600	8
Year-to-Year Increase (%)	9	7	10	11	10	9	7	4	
REVENUE DATA ($M)									
CPU Revenue	56	48	58	67	71	76	80	86	8
Terminal Revenue	6	4	4	3	2	2	1	1	-26
Peripheral Revenue	8	3	3	3	3	3	3	3	0
Hardware Revenue	69	54	65	74	76	80	84	90	7
Year-to-Year Increase (%)	-16	-21	19	14	4	5	5	6	
Software Revenue	33	32	40	49	53	58	64	69	11
Year-to-Year Increase (%)	-6	-3	25	22	8	10	9	9	
Software Service	9	8	12	15	16	17	18	19	9
Hardware Service	13	11	13	14	14	14	15	15	4
Service Revenue	22	19	25	30	31	32	33	34	6
Year-to-Year Increase (%)	-17	-15	33	18	3	4	4	4	
Total Factory Revenue	125	105	130	152	160	171	181	193	8
Year-to-Year Increase (%)	-14	-15	23	17	5	6	6	7	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-3
CAD/CAM/CAE/GIS Software History and Forecast
Detail Benelux Forecast, AEC, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	3,465	4,136	4,995	5,800	6,400	7,000	7,600	8,300	11
Seats	3,505	4,155	5,012	5,800	6,400	7,000	7,600	8,300	11
Year-to-Year Increase (%)	19	19	21	16	9	9	9	9	
Installed Base									
CPUs	11,115	13,864	17,203	20,600	23,700	26,200	27,600	28,800	11
Seats	11,510	14,168	17,422	20,700	23,800	26,300	27,700	28,900	11
Year-to-Year Increase (%)	27	23	23	19	15	10	5	4	
REVENUE DATA ($M)									
CPU Revenue	22	22	26	33	37	42	46	50	14
Terminal Revenue	1	0	0	0	0	0	0	0	-36
Peripheral Revenue	2	1	1	2	2	2	2	2	9
Hardware Revenue	24	24	28	35	39	44	48	52	13
Year-to-Year Increase (%)	-3	-2	18	24	11	13	9	10	
Software Revenue	16	17	20	26	28	31	34	37	12
Year-to-Year Increase (%)	10	9	19	25	9	10	10	9	
Software Service	3	3	4	5	5	6	7	7	12
Hardware Service	4	4	5	5	6	6	7	7	10
Service Revenue	6	7	9	10	11	12	13	15	11
Year-to-Year Increase (%)	-1	10	21	20	8	10	9	9	
Total Factory Revenue	47	48	57	71	78	87	95	103	13
Year-to-Year Increase (%)	1	3	19	24	10	11	9	9	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-4
CAD/CAM/CAE/GIS Software History and Forecast
Detail Benelux Forecast, GIS/Mapping, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	1,522	2,026	2,201	2,600	3,000	3,400	3,900	4,300	15
Seats	1,595	2,086	2,218	2,700	3,000	3,400	3,900	4,300	14
Year-to-Year Increase (%)	76	31	6	20	14	13	13	12	
Installed Base									
CPUs	3,828	5,493	7,231	9,100	10,900	12,500	13,700	14,900	16
Seats	4,130	5,788	7,479	9,300	11,000	12,600	13,800	15,000	15
Year-to-Year Increase (%)	47	40	29	24	19	14	10	8	
REVENUE DATA ($M)									
CPU Revenue	23	27	27	30	32	35	39	43	10
Terminal Revenue	1	1	0	0	0	0	0	0	-70
Peripheral Revenue	3	2	2	2	2	2	2	2	4
Hardware Revenue	27	30	29	32	34	37	41	45	9
Year-to-Year Increase (%)	39	11	-2	9	6	11	9	10	
Software Revenue	17	20	20	23	25	27	30	32	10
Year-to-Year Increase (%)	76	22	-3	19	8	9	9	8	
Software Service	6	7	7	8	8	9	9	9	5
Hardware Service	5	7	7	7	7	7	7	8	4
Service Revenue	11	14	14	15	15	16	17	17	4
Year-to-Year Increase (%)	94	29	-1	4	2	5	5	5	
Total Factory Revenue	54	64	63	70	74	80	87	94	8
Year-to-Year Increase (%)	58	18	-2	11	6	9	8	9	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-5
CAD/CAM/CAE/GIS Software History and Forecast
Detail Benelux Forecast, Electronic Design Automation, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	2,043	2,094	2,383	2,700	3,200	3,700	4,500	5,800	19
Seats	2,047	2,083	2,378	2,700	3,200	3,700	4,500	5,800	19
Year-to-Year Increase (%)	-10	2	14	13	17	18	20	29	
Installed Base									
CPUs	9,107	9,978	10,987	11,900	13,000	14,400	16,100	18,400	11
Seats	9,273	10,087	11,044	12,000	13,000	14,400	16,100	18,400	11
Year-to-Year Increase (%)	12	9	9	8	9	11	11	14	
REVENUE DATA ($M)									
CPU Revenue	19	18	19	20	25	31	39	56	24
Terminal Revenue	1	1	0	0	0	0	0	0	-6
Peripheral Revenue	0	0	0	0	0	0	0	1	53
Hardware Revenue	20	19	19	20	25	31	39	57	24
Year-to-Year Increase (%)	-25	-4	2	5	23	25	27	44	
Software Revenue	12	12	14	16	19	23	29	39	22
Year-to-Year Increase (%)	-19	2	18	12	19	22	24	35	
Software Service	3	3	4	5	6	7	9	12	22
Hardware Service	4	4	3	3	4	5	6	9	21
Service Revenue	7	7	8	8	10	12	15	21	21
Year-to-Year Increase (%)	-22	1	9	8	19	22	24	36	
Total Factory Revenue	39	38	41	45	54	67	84	116	23
Year-to-Year Increase (%)	-23	-2	8	8	21	23	25	39	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-6
CAD/CAM/CAE/GIS Software History and Forecast
Detail Scandinavia Forecast, All Applications, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	12,993	14,494	16,507	19,200	21,800	24,600	27,700	31,400	14
Seats	13,693	14,826	16,766	19,400	21,900	24,700	27,800	31,400	13
Year-to-Year Increase (%)	9	8	13	16	13	13	12	13	
Installed Base									
CPUs	56,441	61,137	67,824	76,000	84,700	94,000	102,100	110,000	10
Seats	60,633	64,552	70,522	78,100	86,300	95,300	103,300	111,200	10
Year-to-Year Increase (%)	9	6	9	11	11	10	8	8	
REVENUE DATA ($M)									
CPU Revenue	152	136	153	177	199	228	256	297	14
Terminal Revenue	12	7	6	4	3	2	2	1	-27
Peripheral Revenue	15	9	9	10	11	11	12	12	7
Hardware Revenue	179	152	167	192	213	241	270	311	13
Year-to-Year Increase (%)	-3	-15	10	14	11	13	12	15	
Software Revenue	101	99	114	137	154	175	198	230	15
Year-to-Year Increase (%)	2	-2	15	20	13	14	13	16	
Software Service	32	33	44	52	57	63	69	75	11
Hardware Service	35	31	33	36	38	42	47	53	10
Service Revenue	67	64	77	88	96	105	115	128	11
Year-to-Year Increase (%)	7	-5	21	14	9	10	10	11	
Total Factory Revenue	347	315	359	416	463	522	584	668	13
Year-to-Year Increase (%)	0	-9	14	16	11	13	12	15	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-7
CAD/CAM/CAE/GIS Software History and Forecast
Detail Scandinavia Forecast, Mechanical, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	5,100	5,058	5,585	6,300	6,900	7,600	8,200	8,900	10
Seats	5,663	5,319	5,826	6,500	7,100	7,700	8,300	8,900	9
Year-to-Year Increase (%)	-2	-6	10	12	8	9	8	8	
Installed Base									
CPUs	22,628	24,009	25,771	27,700	29,600	31,600	33,500	34,800	6
Seats	25,781	26,601	27,885	29,400	30,900	32,800	34,600	35,900	5
Year-to-Year Increase (%)	9	3	5	6	5	6	5	4	
REVENUE DATA ($M)									
CPU Revenue	73	55	62	69	73	79	85	92	8
Terminal Revenue	9	6	5	4	3	2	2	1	-26
Peripheral Revenue	8	4	4	5	4	4	4	4	0
Hardware Revenue	90	65	72	77	81	86	91	97	6
Year-to-Year Increase (%)	-8	-28	11	8	4	6	6	7	
Software Revenue	44	37	44	50	54	60	65	71	10
Year-to-Year Increase (%)	-12	-15	18	15	8	10	9	9	
Software Service	13	11	17	20	21	23	24	25	7
Hardware Service	18	13	14	14	14	15	15	16	3
Service Revenue	32	24	31	34	36	37	39	41	6
Year-to-Year Increase (%)	-6	-24	28	11	4	4	5	4	
Total Factory Revenue	165	126	147	162	171	183	195	209	7
Year-to-Year Increase (%)	-9	-24	16	11	5	7	7	7	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-8
CAD/CAM/CAE/GIS Software History and Forecast
Detail Scandinavia Forecast, AEC, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	3,715	4,194	4,536	5,300	5,900	6,500	7,000	7,800	11
Seats	3,766	4,223	4,544	5,300	5,900	6,500	7,000	7,800	11
Year-to-Year Increase (%)	13	12	8	16	12	9	9	10	
Installed Base									
CPUs	16,789	17,843	19,247	21,100	23,100	24,800	26,000	27,000	7
Seats	17,261	18,209	19,502	21,300	23,200	24,900	26,100	27,100	7
Year-to-Year Increase (%)	8	5	7	9	9	7	5	4	
REVENUE DATA ($M)									
CPU Revenue	25	22	24	31	36	41	45	51	16
Terminal Revenue	1	1	0	0	0	0	0	0	-36
Peripheral Revenue	3	2	2	2	2	2	3	3	12
Hardware Revenue	29	24	26	33	38	43	48	54	15
Year-to-Year Increase (%)	-2	-17	9	28	14	14	10	12	
Software Revenue	19	17	19	24	27	29	32	36	14
Year-to-Year Increase (%)	3	-9	11	27	12	10	10	11	
Software Service	4	3	4	5	5	6	6	7	14
Hardware Service	4	4	5	6	6	7	7	8	12
Service Revenue	8	7	8	10	11	12	14	15	12
Year-to-Year Increase (%)	-3	-15	22	21	10	11	9	11	
Total Factory Revenue	56	48	53	68	76	85	94	105	14
Year-to-Year Increase (%)	-1	-14	12	27	13	12	10	12	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-9
CAD/CAM/CAE/GIS Software History and Forecast
Detail Scandinavia Forecast, GIS/Mapping, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	2,050	2,284	2,936	3,700	4,500	5,400	6,500	7,600	21
Seats	2,125	2,337	2,957	3,700	4,500	5,400	6,500	7,600	21
Year-to-Year Increase (%)	79	10	27	26	21	20	19	17	
Installed Base									
CPUs	5,766	7,303	9,428	11,900	14,900	18,000	20,800	23,800	20
Seats	6,143	7,633	9,692	12,100	15,000	18,100	20,900	23,800	20
Year-to-Year Increase (%)	33	24	27	25	24	20	15	14	
REVENUE DATA ($M)									
CPU Revenue	27	27	32	40	46	55	64	74	18
Terminal Revenue	1	1	0	0	0	0	0	0	-69
Peripheral Revenue	4	3	3	4	4	4	4	4	11
Hardware Revenue	32	31	35	43	50	59	68	79	17
Year-to-Year Increase (%)	21	-2	13	23	15	19	15	16	
Software Revenue	20	21	25	32	38	44	50	57	18
Year-to-Year Increase (%)	58	7	17	30	17	16	15	13	
Software Service	7	7	9	11	12	13	15	16	13
Hardware Service	6	7	8	9	10	11	13	15	13
Service Revenue	13	14	17	20	22	25	28	31	13
Year-to-Year Increase (%)	65	5	21	16	11	13	11	11	
Total Factory Revenue	65	67	77	96	110	128	146	167	17
Year-to-Year Increase (%)	38	2	16	24	15	17	14	14	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-10
CAD/CAM/CAE/GIS Software History and Forecast
Detail Scandinavia Forecast, Electronic Design Automation, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	2,128	2,957	3,450	3,900	4,400	5,100	6,000	7,200	16
Seats	2,139	2,947	3,438	3,900	4,400	5,100	6,000	7,200	16
Year-to-Year Increase (%)	-3	38	17	13	14	16	16	20	
Installed Base									
CPUs	11,259	11,983	13,377	15,200	17,200	19,500	21,800	24,400	13
Seats	11,448	12,109	13,443	15,200	17,200	19,500	21,700	24,400	13
Year-to-Year Increase (%)	3	6	11	13	13	13	11	12	
REVENUE DATA ($M)									
CPU Revenue	27	32	34	37	44	53	63	80	19
Terminal Revenue	1	1	0	0	0	0	0	0	-9
Peripheral Revenue	0	0	0	0	0	0	0	1	49
Hardware Revenue	28	32	34	37	44	53	63	81	19
Year-to-Year Increase (%)	-10	15	5	10	18	20	20	28	
Software Revenue	19	23	27	30	35	41	50	65	20
Year-to-Year Increase (%)	1	25	14	12	16	19	21	30	
Software Service	8	11	14	16	19	21	24	27	14
Hardware Service	6	7	7	7	8	10	11	14	16
Service Revenue	14	19	21	23	27	31	35	41	15
Year-to-Year Increase (%)	14	35	11	13	14	15	15	18	
Total Factory Revenue	61	75	81	91	106	125	149	188	18
Year-to-Year Increase (%)	-2	22	9	11	17	18	19	26	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-11
CAD/CAM/CAE/GIS Software History and Forecast
Detail Spain Forecast, All Applications, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	8,409	7,953	8,214	9,700	10,900	12,200	13,600	15,300	13
Seats	8,707	8,196	8,368	9,800	11,000	12,300	13,700	15,300	13
Year-to-Year Increase (%)	-1	-6	2	17	12	11	11	12	
Installed Base									
CPUs	22,749	29,579	34,964	39,200	42,900	46,100	49,400	52,200	8
Seats	23,823	30,824	36,172	40,200	43,800	46,900	50,100	52,900	8
Year-to-Year Increase (%)	58	29	17	11	9	7	7	6	
REVENUE DATA ($M)									
CPU Revenue	71	60	64	75	85	96	107	123	14
Terminal Revenue	5	4	3	2	1	1	1	0	-29
Peripheral Revenue	11	6	4	5	6	6	6	7	8
Hardware Revenue	86	70	71	82	92	103	114	130	13
Year-to-Year Increase (%)	-11	-19	1	17	12	12	10	14	
Software Revenue	54	48	51	61	68	75	83	93	13
Year-to-Year Increase (%)	5	-12	6	20	11	11	11	12	
Software Service	15	15	18	21	22	24	25	27	9
Hardware Service	15	13	13	14	15	17	19	21	10
Service Revenue	30	27	31	35	38	41	44	48	10
Year-to-Year Increase (%)	3	-9	12	14	8	8	8	10	
Total Factory Revenue	170	145	152	178	197	219	241	271	12
Year-to-Year Increase (%)	-4	-15	5	17	11	11	10	12	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-12
CAD/CAM/CAE/GIS Software History and Forecast
Detail Spain Forecast, Mechanical, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	4,024	3,225	2,965	3,300	3,600	3,800	4,100	4,300	8
Seats	4,241	3,383	3,088	3,400	3,700	3,900	4,100	4,300	7
Year-to-Year Increase (%)	-9	-20	-9	10	8	6	5	6	
Installed Base									
CPUs	10,793	13,570	15,251	16,000	16,200	16,300	16,700	16,600	2
Seats	11,528	14,420	16,098	16,800	16,900	16,900	17,300	17,200	1
Year-to-Year Increase (%)	58	25	12	4	1	0	2	-1	
REVENUE DATA ($M)									
CPU Revenue	34	26	26	30	33	35	37	40	9
Terminal Revenue	3	3	2	2	1	1	1	0	-27
Peripheral Revenue	7	3	2	2	2	2	2	2	1
Hardware Revenue	45	32	31	34	36	38	40	42	7
Year-to-Year Increase (%)	-16	-28	-5	10	8	6	4	6	
Software Revenue	26	21	21	24	26	28	30	32	9
Year-to-Year Increase (%)	-4	-19	2	14	9	7	7	7	
Software Service	7	7	8	9	10	10	11	11	6
Hardware Service	8	6	5	6	6	6	7	7	5
Service Revenue	14	12	13	15	16	17	17	18	6
Year-to-Year Increase (%)	-12	-15	9	14	6	3	3	3	
Total Factory Revenue	85	66	65	73	79	83	87	92	7
Year-to-Year Increase (%)	-12	-23	0	12	8	6	5	6	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-13
CAD/CAM/CAE/GIS Software History and Forecast
Detail Spain Forecast, AEC, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	2,446	2,619	2,793	3,400	3,800	4,300	4,900	5,500	14
Seats	2,472	2,641	2,799	3,400	3,900	4,300	4,900	5,500	14
Year-to-Year Increase (%)	7	7	6	21	14	13	12	12	
Installed Base									
CPUs	6,674	8,915	10,819	12,500	14,200	15,500	16,700	17,800	10
Seats	6,789	9,042	10,928	12,600	14,200	15,600	16,700	17,800	10
Year-to-Year Increase (%)	57	33	21	15	13	9	8	6	
REVENUE DATA ($M)									
CPU Revenue	13	10	11	15	17	20	23	26	18
Terminal Revenue	0	0	0	0	0	0	0	0	-34
Peripheral Revenue	1	1	1	1	1	1	1	1	14
Hardware Revenue	14	11	12	16	18	22	24	27	18
Year-to-Year Increase (%)	-18	-22	7	31	18	17	12	13	
Software Revenue	10	9	10	12	14	15	17	19	15
Year-to-Year Increase (%)	4	-14	10	27	13	13	12	12	
Software Service	2	1	1	2	2	2	3	3	16
Hardware Service	2	1	2	2	2	2	3	3	16
Service Revenue	3	2	3	4	4	5	5	6	16
Year-to-Year Increase (%)	-16	-30	16	28	12	14	13	13	
Total Factory Revenue	28	22	24	31	36	42	47	52	17
Year-to-Year Increase (%)	-11	-20	9	29	15	15	12	12	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-14
CAD/CAM/CAE/GIS Software History and Forecast
Detail Spain Forecast, GIS/Mapping, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	1,219	1,433	1,768	2,300	2,700	3,200	3,700	4,300	20
Seats	1,258	1,488	1,790	2,300	2,700	3,200	3,700	4,300	19
Year-to-Year Increase (%)	48	18	20	27	19	17	17	16	
Installed Base									
CPUs	2,735	4,045	5,529	7,200	9,000	10,700	12,200	13,800	20
Seats	2,866	4,219	5,701	7,300	9,100	10,800	12,300	13,800	19
Year-to-Year Increase (%)	78	47	35	29	24	19	14	13	
REVENUE DATA ($M)									
CPU Revenue	17	17	20	24	27	32	36	42	16
Terminal Revenue	0	0	0	0	0	0	0	0	-69
Peripheral Revenue	2	2	2	2	2	2	2	3	10
Hardware Revenue	20	20	22	26	30	34	39	44	15
Year-to-Year Increase (%)	24	-1	10	22	12	16	13	14	
Software Revenue	13	13	15	19	22	25	28	31	16
Year-to-Year Increase (%)	47	1	11	30	14	13	13	12	
Software Service	5	5	6	7	8	8	9	10	9
Hardware Service	4	4	5	5	6	6	7	8	11
Service Revenue	9	10	11	13	14	15	16	18	10
Year-to-Year Increase (%)	79	3	15	14	8	9	9	9	
Total Factory Revenue	42	43	48	58	65	74	83	93	14
Year-to-Year Increase (%)	41	1	11	23	12	13	12	12	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-15
CAD/CAM/CAE/GIS Software History and Forecast
Detail Spain Forecast, Electronic Design Automation, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	720	676	687	700	800	900	1,000	1,200	12
Seats	736	685	690	700	800	900	1,000	1,200	12
Year-to-Year Increase (%)	-20	-7	1	5	8	10	14	26	
Installed Base									
CPUs	2,548	3,048	3,365	3,500	3,600	3,600	3,800	4,100	4
Seats	2,640	3,143	3,444	3,600	3,600	3,700	3,800	4,100	4
Year-to-Year Increase (%)	39	19	10	3	2	1	4	7	
REVENUE DATA ($M)									
CPU Revenue	7	6	6	7	8	9	11	15	19
Terminal Revenue	0	0	0	0	0	0	0	0	-17
Peripheral Revenue	0	0	0	0	0	0	0	0	41
Hardware Revenue	7	7	7	7	8	9	11	16	19
Year-to-Year Increase (%)	-28	-8	-2	4	13	18	22	42	
Software Revenue	5	5	5	5	6	7	8	10	15
Year-to-Year Increase (%)	-17	-7	5	4	11	15	18	28	
Software Service	1	2	2	2	2	3	3	4	16
Hardware Service	1	1	1	1	1	2	2	3	17
Service Revenue	3	3	3	3	4	4	5	7	17
Year-to-Year Increase (%)	-22	11	6	6	11	17	19	32	
Total Factory Revenue	15	15	15	16	18	20	25	33	17
Year-to-Year Increase (%)	-24	-4	2	4	12	17	20	35	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-16
CAD/CAM/CAE/GIS Software History and Forecast
Detail Russia Forecast, All Applications, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	98	212	630	700	900	1,100	1,300	1,500	19
Seats	114	241	642	800	900	1,100	1,300	1,500	19
Year-to-Year Increase (%)	NA	112	167	17	18	18	19	21	
Installed Base									
CPUs	98	310	940	1,700	2,500	3,300	4,000	4,800	39
Seats	114	354	996	1,700	2,600	3,300	4,100	4,800	37
Year-to-Year Increase (%)	NA	212	181	74	48	31	22	19	
REVENUE DATA ($M)									
CPU Revenue	3	3	8	9	11	13	15	18	18
Terminal Revenue	0	0	0	0	0	0	0	0	-69
Peripheral Revenue	0	0	0	0	0	0	0	0	4
Hardware Revenue	3	3	8	10	11	13	15	18	17
Year-to-Year Increase (%)	NA	13	174	19	16	16	16	20	
Software Revenue	2	2	7	8	9	11	13	15	18
Year-to-Year Increase (%)	NA	14	188	20	16	16	17	21	
Software Service	1	2	3	4	4	4	5	5	11
Hardware Service	1	1	2	2	2	2	3	3	12
Service Revenue	2	2	5	6	6	7	7	8	11
Year-to-Year Increase (%)	NA	6	114	17	12	9	10	9	
Total Factory Revenue	7	8	20	23	27	31	35	42	16
Year-to-Year Increase (%)	NA	11	161	19	15	14	15	18	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-17
CAD/CAM/CAE/GIS Software History and Forecast
Detail Russia Forecast, Mechanical, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	-	27	93	100	200	200	200	300	23
Seats	-	27	93	100	200	200	200	300	23
Year-to-Year Increase (%)	NA	NA	245	51	25	17	15	12	
Installed Base									
CPUs	-	27	120	300	400	600	800	900	51
Seats	-	27	120	300	400	600	800	900	51
Year-to-Year Increase (%)	NA	NA	345	117	65	42	30	19	
REVENUE DATA ($M)									
CPU Revenue	-	0	2	3	3	4	4	5	24
Terminal Revenue	-	-	-	-	-	-	-	-	NA
Peripheral Revenue	-	0	0	0	0	0	0	0	6
Hardware Revenue	-	1	2	3	3	4	4	5	22
Year-to-Year Increase (%)	NA	NA	215	53	23	15	13	10	
Software Revenue	-	0	1	2	3	3	3	4	23
Year-to-Year Increase (%)	NA	NA	243	54	25	16	15	11	
Software Service	-	0	1	1	1	1	1	1	19
Hardware Service	-	0	0	1	1	1	1	1	21
Service Revenue	-	0	1	2	2	2	2	2	20
Year-to-Year Increase (%)	NA	NA	107	58	22	11	10	5	
Total Factory Revenue	-	1	4	6	8	9	10	11	22
Year-to-Year Increase (%)	NA	NA	188	54	23	15	13	9	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-18
CAD/CAM/CAE/GIS Software History and Forecast
Detail Russia Forecast, AEC, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	-	20	43	0	100	100	100	100	13
Seats	-	20	43	0	100	100	100	100	13
Year-to-Year Increase (%)	NA	NA	117	10	13	14	14	14	
Installed Base									
CPUs	-	20	62	100	200	200	200	200	32
Seats	-	20	62	100	200	200	200	200	32
Year-to-Year Increase (%)	NA	NA	217	76	44	25	11	13	
REVENUE DATA ($M)									
CPU Revenue	-	0	0	0	0	0	0	0	14
Terminal Revenue	-	-	-	-	-	-	-	-	NA
Peripheral Revenue	-	-	-	-	-	-	-	-	NA
Hardware Revenue	-	0	0	0	0	0	0	0	14
Year-to-Year Increase (%)	NA	NA	135	10	21	18	10	10	
Software Revenue	-	0	0	0	0	0	0	0	10
Year-to-Year Increase (%)	NA	NA	123	6	10	12	11	11	
Software Service	-	0	0	0	0	0	0	0	13
Hardware Service	-	-	-	-	-	-	-	-	NA
Service Revenue	-	0	0	0	0	0	0	0	-33
Year-to-Year Increase (%)	NA	NA	3,605	-92	14	14	14	14	
Total Factory Revenue	-	0	0	0	0	0	0	0	10
Year-to-Year Increase (%)	NA	NA	155	-3	16	15	11	11	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-19
CAD/CAM/CAE/GIS Software History and Forecast
Detail Russia Forecast, GIS/Mapping, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	88	152	430	500	600	700	800	900	16
Seats	104	181	442	500	600	700	800	900	16
Year-to-Year Increase (%)	NA	74	145	9	15	18	19	18	
Installed Base									
CPUs	88	240	670	1,100	1,600	2,100	2,500	2,900	34
Seats	104	285	727	1,200	1,700	2,200	2,500	3,000	32
Year-to-Year Increase (%)	NA	174	155	64	42	27	18	17	
REVENUE DATA ($M)									
CPU Revenue	2	2	5	5	6	6	7	8	10
Terminal Revenue	0	0	0	0	0	0	0	0	-69
Peripheral Revenue	0	0	0	0	0	0	0	0	-1
Hardware Revenue	2	2	5	5	6	6	7	8	10
Year-to-Year Increase (%)	NA	-14	138	3	9	13	13	13	
Software Revenue	2	2	4	4	5	5	6	7	11
Year-to-Year Increase (%)	NA	-10	151	6	9	12	13	13	
Software Service	1	1	2	2	2	2	2	2	1
Hardware Service	1	0	1	1	1	1	1	1	3
Service Revenue	2	2	3	3	3	3	3	3	2
Year-to-Year Increase (%)	NA	-19	74	-5	1	4	5	5	
Total Factory Revenue	6	5	12	12	13	14	16	18	9
Year-to-Year Increase (%)	NA	-14	124	2	7	11	12	12	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-20
CAD/CAM/CAE/GIS Software History and Forecast
Detail Russia Forecast, Electronic Design Automation, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	10	13	65	100	100	100	200	300	31
Seats	10	13	65	100	100	100	200	300	31
Year-to-Year Increase (%)	NA	35	388	33	27	24	30	46	
Installed Base									
CPUs	10	23	88	200	300	400	500	700	52
Seats	10	23	88	200	300	400	500	700	52
Year-to-Year Increase (%)	NA	135	280	96	61	42	36	34	
REVENUE DATA ($M)									
CPU Revenue	0	0	1	2	2	3	3	5	32
Terminal Revenue	-	-	-	-	-	-	-	-	NA
Peripheral Revenue	-	-	-	-	-	-	-	-	NA
Hardware Revenue	0	0	1	2	2	3	3	5	32
Year-to-Year Increase (%)	NA	28	382	35	26	23	29	47	
Software Revenue	0	0	1	1	2	2	3	4	33
Year-to-Year Increase (%)	NA	24	393	34	26	24	32	52	
Software Service	0	0	1	1	1	2	2	2	20
Hardware Service	0	0	0	0	0	1	1	1	22
Service Revenue	0	0	1	1	2	2	2	3	20
Year-to-Year Increase (%)	NA	11	399	35	21	15	16	16	
Total Factory Revenue	1	1	3	5	6	7	9	12	29
Year-to-Year Increase (%)	NA	21	391	35	25	21	26	40	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-21
CAD/CAM/CAE/GIS Software History and Forecast
Detail Central Europe Forecast, All Applications, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	758	1,787	3,004	4,800	5,900	7,000	7,900	9,100	25
Seats	854	1,834	3,020	4,800	5,900	7,000	8,000	9,100	25
Year-to-Year Increase (%)	895	115	65	60	23	17	14	14	
Installed Base									
CPUs	923	2,694	5,664	10,300	15,600	20,900	25,100	29,000	39
Seats	1,018	2,837	5,823	10,400	15,700	21,000	25,200	29,100	38
Year-to-Year Increase (%)	520	179	105	79	51	34	20	16	
REVENUE DATA ($M)									
CPU Revenue	13	27	36	55	67	80	91	105	24
Terminal Revenue	1	0	0	0	0	0	0	0	-26
Peripheral Revenue	1	3	3	5	5	5	6	6	18
Hardware Revenue	15	30	39	60	72	85	96	111	23
Year-to-Year Increase (%)	2,528	107	27	54	20	19	13	15	
Software Revenue	9	21	27	43	52	60	68	75	23
Year-to-Year Increase (%)	1,997	124	30	58	21	17	13	11	
Software Service	2	7	10	15	17	20	22	23	19
Hardware Service	4	7	9	12	14	17	19	21	19
Service Revenue	6	14	18	27	32	37	40	44	19
Year-to-Year Increase (%)	3,712	152	28	48	17	15	10	10	
Total Factory Revenue	30	65	84	130	155	182	204	230	22
Year-to-Year Increase (%)	2,479	121	29	54	20	17	12	13	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-22
CAD/CAM/CAE/GIS Software History and Forecast
Detail Central Europe Forecast, Mechanical, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	687	1,037	1,429	1,700	1,900	2,300	2,500	2,700	14
Seats	783	1,082	1,447	1,700	1,900	2,300	2,500	2,700	13
Year-to-Year Increase (%)	944	38	34	16	15	18	10	8	
Installed Base									
CPUs	830	1,855	3,254	4,700	6,200	7,800	9,100	10,200	26
Seats	926	1,995	3,412	4,900	6,400	7,900	9,200	10,300	25
Year-to-Year Increase (%)	547	115	71	43	31	24	17	11	
REVENUE DATA ($M)									
CPU Revenue	13	18	22	26	30	35	38	41	13
Terminal Revenue	1	0	0	0	0	0	0	0	-24
Peripheral Revenue	1	1	1	1	1	1	1	1	-1
Hardware Revenue	15	20	24	28	31	36	40	43	12
Year-to-Year Increase (%)	2,653	39	17	16	13	16	9	7	
Software Revenue	9	15	17	20	23	27	30	32	13
Year-to-Year Increase (%)	2,086	61	18	19	15	17	10	7	
Software Service	2	5	7	8	9	10	11	11	10
Hardware Service	4	5	5	6	7	7	8	8	10
Service Revenue	6	10	12	14	16	17	18	19	10
Year-to-Year Increase (%)	3,736	77	18	18	11	12	5	2	
Total Factory Revenue	29	45	53	62	70	81	88	94	12
Year-to-Year Increase (%)	2,586	53	18	18	13	15	8	6	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-23
CAD/CAM/CAE/GIS Software History and Forecast
Detail Central Europe Forecast, AEC, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	22	389	767	1,500	1,800	2,100	2,400	2,700	28
Seats	22	393	771	1,500	1,800	2,100	2,400	2,700	28
Year-to-Year Increase (%)	507	1,665	96	94	24	14	13	12	
Installed Base									
CPUs	29	417	1,183	2,700	4,400	6,100	7,300	8,400	48
Seats	29	422	1,191	2,700	4,400	6,100	7,300	8,400	48
Year-to-Year Increase (%)	314	1,337	182	125	65	38	20	15	
REVENUE DATA ($M)									
CPU Revenue	0	2	5	10	12	15	17	19	33
Terminal Revenue	-	0	0	0	0	0	0	0	-26
Peripheral Revenue	-	0	0	1	1	1	1	1	24
Hardware Revenue	0	3	5	11	13	16	18	20	32
Year-to-Year Increase (%)	434	4,335	94	111	26	18	14	14	
Software Revenue	0	2	4	8	9	11	12	14	31
Year-to-Year Increase (%)	522	3,302	95	111	23	15	14	13	
Software Service	0	1	1	2	2	2	3	3	30
Hardware Service	-	0	1	2	2	3	3	3	29
Service Revenue	0	1	2	4	4	5	6	6	29
Year-to-Year Increase (%)	2,409	9,179	64	103	22	15	13	13	
Total Factory Revenue	0	5	10	22	27	31	35	40	31
Year-to-Year Increase (%)	517	4,333	89	110	24	16	14	14	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-24
CAD/CAM/CAE/GIS Software History and Forecast
Detail Central Europe Forecast, GIS/Mapping, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	-	296	624	1,400	1,900	2,200	2,600	3,000	37
Seats	-	294	619	1,400	1,900	2,200	2,600	3,000	37
Year-to-Year Increase (%)	NA	NA	110	130	31	19	18	16	
Installed Base									
CPUs	-	296	919	2,300	4,200	6,000	7,400	8,800	57
Seats	-	294	913	2,300	4,100	5,900	7,400	8,800	57
Year-to-Year Increase (%)	NA	NA	210	156	77	44	24	19	
REVENUE DATA ($M)									
CPU Revenue	-	6	8	18	22	27	32	38	37
Terminal Revenue	-	0	0	0	0	0	0	0	-66
Peripheral Revenue	-	2	1	3	3	3	3	4	26
Hardware Revenue	-	7	9	20	25	31	35	42	36
Year-to-Year Increase (%)	NA	NA	26	127	25	21	16	17	
Software Revenue	-	4	5	14	18	20	23	27	38
Year-to-Year Increase (%)	NA	NA	39	158	29	17	15	13	
Software Service	-	1	2	5	6	7	8	9	34
Hardware Service	-	2	2	5	6	7	8	9	29
Service Revenue	-	3	4	9	11	13	15	17	31
Year-to-Year Increase (%)	NA	NA	45	108	24	17	14	14	
Total Factory Revenue	-	14	19	43	54	64	74	85	36
Year-to-Year Increase (%)	NA	NA	34	132	26	19	15	15	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-25
CAD/CAM/CAE/GIS Software History and Forecast
Detail Central Europe Forecast, Electronic Design Automation, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	49	65	184	200	300	400	400	600	28
Seats	49	65	184	200	300	400	400	600	28
Year-to-Year Increase (%)	577	34	182	25	25	25	25	43	
Installed Base									
CPUs	63	127	307	500	800	1,000	1,300	1,700	40
Seats	63	127	307	500	800	1,000	1,300	1,700	40
Year-to-Year Increase (%)	351	102	143	69	49	35	23	29	
REVENUE DATA ($M)									
CPU Revenue	0	1	1	1	2	3	3	6	39
Terminal Revenue	-	-	-	-	-	-	-	-	NA
Peripheral Revenue	-	0	0	0	0	0	0	0	88
Hardware Revenue	0	1	1	1	2	3	4	6	40
Year-to-Year Increase (%)	495	334	107	24	33	37	37	73	
Software Revenue	0	0	1	1	1	2	2	3	28
Year-to-Year Increase (%)	592	283	86	20	27	30	27	39	
Software Service	0	0	0	0	0	1	1	1	36
Hardware Service	-	0	0	0	0	0	0	1	37
Service Revenue	0	0	0	0	1	1	1	2	37
Year-to-Year Increase (%)	466	3,982	84	20	31	39	37	59	
Total Factory Revenue	0	1	2	3	4	5	7	11	36
Year-to-Year Increase (%)	537	384	95	22	31	35	33	60	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-26
CAD/CAM/CAE/GIS Software History and Forecast
Detail Rest of Europe Forecast, All Applications, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	20,794	23,229	18,780	19,700	20,200	21,200	22,400	23,700	5
Seats	21,394	23,889	19,186	20,000	20,400	21,400	22,500	23,800	4
Year-to-Year Increase (%)	-3	12	-20	4	2	5	5	5	
Installed Base									
CPUs	78,755	91,361	97,579	100,900	100,600	98,900	97,700	95,100	-1
Seats	81,554	94,437	100,499	103,500	102,800	100,900	99,600	96,900	-1
Year-to-Year Increase (%)	20	16	6	3	-1	-2	-1	-3	
REVENUE DATA ($M)									
CPU Revenue	186	160	124	131	137	146	154	164	6
Terminal Revenue	10	12	8	6	4	3	2	1	-30
Peripheral Revenue	25	9	7	7	7	7	6	6	-3
Hardware Revenue	221	181	139	144	148	156	162	171	4
Year-to-Year Increase (%)	-18	-18	-23	3	3	5	4	5	
Software Revenue	144	132	103	109	111	117	124	132	5
Year-to-Year Increase (%)	-2	-8	-22	6	2	5	6	6	
Software Service	38	32	27	28	28	29	29	30	2
Hardware Service	40	31	21	22	22	22	23	24	2
Service Revenue	78	64	48	50	50	51	52	53	2
Year-to-Year Increase (%)	-5	-18	-24	4	0	2	3	2	
Total Factory Revenue	443	377	290	303	309	323	339	356	4
Year-to-Year Increase (%)	-11	-15	-23	4	2	5	5	5	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-27
CAD/CAM/CAE/GIS Software History and Forecast
Detail Rest of Europe Forecast, Mechanical, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	8,443	7,625	6,039	6,600	6,800	7,000	7,200	7,400	4
Seats	8,817	8,071	6,322	6,900	6,900	7,100	7,300	7,400	3
Year-to-Year Increase (%)	-8	-8	-22	9	1	3	3	2	
Installed Base									
CPUs	32,134	35,507	36,523	36,600	35,500	34,300	33,400	31,800	-3
Seats	34,055	37,605	38,512	38,400	37,000	35,700	34,800	33,200	-3
Year-to-Year Increase (%)	20	10	2	0	-4	-4	-3	-5	
REVENUE DATA ($M)									
CPU Revenue	84	58	42	47	49	51	53	54	5
Terminal Revenue	7	9	6	4	3	2	2	1	-30
Peripheral Revenue	15	4	4	4	4	3	3	3	-3
Hardware Revenue	105	72	52	55	56	57	57	58	2
Year-to-Year Increase (%)	-25	-32	-28	7	1	2	1	1	
Software Revenue	66	49	35	39	40	41	43	44	5
Year-to-Year Increase (%)	-6	-26	-28	11	1	4	4	3	
Software Service	17	11	8	10	10	10	10	10	4
Hardware Service	19	12	7	8	8	8	8	8	2
Service Revenue	37	22	15	18	17	18	18	18	3
Year-to-Year Increase (%)	-19	-39	-30	14	0	1	1	-1	
Total Factory Revenue	208	142	102	112	113	116	118	119	3
Year-to-Year Increase (%)	-19	-31	-28	10	1	3	2	1	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-28
CAD/CAM/CAE/GIS Software History and Forecast
Detail Rest of Europe Forecast, AEC, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	7,848	9,930	8,189	8,300	8,300	8,700	9,200	9,600	3
Seats	7,929	9,993	8,225	8,300	8,300	8,700	9,200	9,600	3
Year-to-Year Increase (%)	0	26	-18	1	0	5	5	5	
Installed Base									
CPUs	28,052	34,369	38,006	40,100	40,300	39,400	38,600	37,100	0
Seats	28,402	34,738	38,344	40,300	40,500	39,600	38,800	37,300	-1
Year-to-Year Increase (%)	25	22	10	5	0	-2	-2	-4	
REVENUE DATA ($M)									
CPU Revenue	44	46	38	39	41	43	46	48	5
Terminal Revenue	1	1	1	0	0	0	0	0	-40
Peripheral Revenue	5	3	2	2	2	2	2	2	-2
Hardware Revenue	51	50	41	42	43	45	47	50	4
Year-to-Year Increase (%)	-26	-1	-19	3	2	6	5	5	
Software Revenue	35	39	33	34	34	35	37	39	3
Year-to-Year Increase (%)	-17	11	-15	3	-1	4	5	5	
Software Service	6	5	3	3	3	4	4	4	3
Hardware Service	7	7	5	5	5	5	5	6	2
Service Revenue	13	12	8	9	8	9	9	9	2
Year-to-Year Increase (%)	-25	-10	-29	3	-2	2	4	3	
Total Factory Revenue	99	101	82	84	85	89	93	98	4
Year-to-Year Increase (%)	-23	2	-19	3	1	5	5	5	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-29
CAD/CAM/CAE/GIS Software History and Forecast
Detail Rest of Europe Forecast, GIS/Mapping, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	1,969	2,767	2,453	2,600	2,700	3,000	3,300	3,600	8
Seats	2,072	2,879	2,514	2,600	2,700	3,000	3,300	3,600	8
Year-to-Year Increase (%)	60	39	-13	3	7	9	10	10	
Installed Base									
CPUs	5,366	7,600	9,362	10,800	11,900	12,700	13,100	13,500	8
Seats	5,681	7,986	9,751	11,100	12,200	12,900	13,300	13,600	7
Year-to-Year Increase (%)	44	41	22	14	9	6	3	3	
REVENUE DATA ($M)									
CPU Revenue	29	31	23	23	23	24	26	27	3
Terminal Revenue	1	1	1	0	0	0	0	0	-72
Peripheral Revenue	4	2	1	1	1	1	1	1	-5
Hardware Revenue	34	34	25	24	24	26	27	29	3
Year-to-Year Increase (%)	24	0	-25	-4	0	6	5	6	
Software Revenue	21	25	19	19	19	20	21	22	3
Year-to-Year Increase (%)	45	19	-26	-1	0	4	5	5	
Software Service	9	11	9	8	8	8	8	8	-4
Hardware Service	7	8	5	4	4	4	4	4	-2
Service Revenue	16	19	14	13	12	12	12	12	-3
Year-to-Year Increase (%)	81	15	-26	-8	-5	-1	0	0	
Total Factory Revenue	71	78	58	56	55	57	60	62	1
Year-to-Year Increase (%)	40	9	-26	-4	-1	4	4	4	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-30
CAD/CAM/CAE/GIS Software History and Forecast
Detail Rest of Europe Forecast, Electronic Design Automation, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	2,535	2,907	2,099	2,200	2,400	2,500	2,700	3,100	8
Seats	2,576	2,948	2,124	2,200	2,400	2,500	2,700	3,100	8
Year-to-Year Increase (%)	-19	14	-28	5	7	6	8	12	
Installed Base									
CPUs	13,203	13,885	13,688	13,400	12,900	12,600	12,600	12,700	-1
Seats	13,416	14,109	13,892	13,600	13,100	12,700	12,800	12,800	-2
Year-to-Year Increase (%)	7	5	-2	-2	-4	-3	0	1	
REVENUE DATA ($M)									
CPU Revenue	29	25	21	22	24	27	30	35	11
Terminal Revenue	1	1	1	0	0	0	0	0	-17
Peripheral Revenue	1	0	0	0	0	0	0	0	19
Hardware Revenue	31	26	21	23	25	28	31	35	10
Year-to-Year Increase (%)	-1	-18	-17	5	11	11	11	15	
Software Revenue	22	19	17	18	19	21	24	28	11
Year-to-Year Increase (%)	6	-13	-13	6	9	10	12	16	
Software Service	5	6	6	7	7	8	8	8	6
Hardware Service	6	5	4	4	5	5	5	6	8
Service Revenue	12	11	10	11	12	13	13	14	7
Year-to-Year Increase (%)	17	-6	-6	7	8	6	7	7	
Total Factory Revenue	65	56	48	51	56	61	68	77	10
Year-to-Year Increase (%)	4	-14	-13	6	10	10	10	14	

NA = Not applicable

Source: Dataquest (October 1995)

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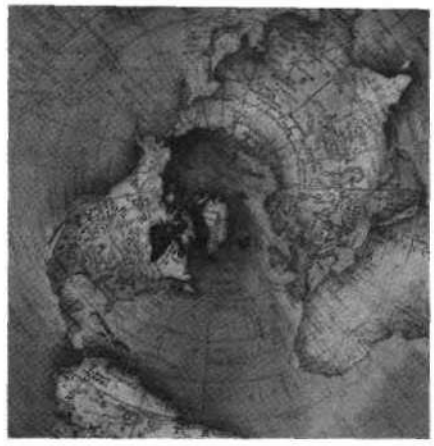
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CAD/CAM/CAE and GIS Italy Forecast Update

Market Statistics

Program: CAD/CAM/CAE/GIS Europe
Product Code: CCAM-EU-MS-9510
Publication Date: December 4, 1995
Filing: Market Analysis

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Note: All tables show estimated data.

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CAD/CAM/CAE and GIS Italy Forecast Update

Fluctuating exchange rates once again masked the true market performance in the 1994 CAD/CAM/CAE and GIS market. Japanese CAD/CAM/CAE and GIS total factory revenue grew 4.8 percent from 1993 to 1994 when measured in U.S. dollars, contrary to what would be expected given the country's prolonged recession. However, the dollar depreciated against the yen at a rate of 8.2 percent so that when measured in yen, Japanese CAD/CAM/CAE and GIS total factory revenue declined 3.8 percent from 1993 to 1994.

Less dramatically, European CAD/CAM/CAE and GIS total factory revenue grew 9.9 percent from 1993 to 1994 when measured in U.S. dollars. With the dollar depreciating 1.5 percent, European CAD/CAM/CAE and GIS total factory revenue grew a lower 8.2 percent from 1993 to 1994 when measured in ECU. Table 1 shows the impact of currency fluctuation on the CAD/CAM/CAE and GIS software market.

Looking ahead, currency fluctuations will continue to be felt in all global markets. The dollar has continued to weaken during the early months of this year so that if we were to assume a stable currency for the remainder of the year, 1995 would end with the dollar depreciating 4.2 percent against the yen and 7.8 percent against the ECU (see Table 2). Although Dataquest does not forecast currency exchange rates, we do forecast with the best information available. The exchange rate is calculated as the simple arithmetic mean of the 12 average monthly rates for each country. For the purpose of this forecast, Dataquest assumes the September exchange rate will remain stable in the future.

This document contains Dataquest's detailed forecast information for the CAD/CAM/CAE and GIS industry. Included are the following:

- Five-year historical data
- Five-year forecast data

More detailed data is available through Dataquest's Client Inquiry service, which can provide custom analysis of the multidimensional database.

Changes to Our Forecast Structure

Dataquest's CAD/CAM/CAE and GIS forecast is based upon the updated market share data gathered before the end of 1994 and updated throughout 1995. In order to better serve you, the new CAD/CAM/CAE and GIS database has been restructured as follows:

- Japan is now tracked as a region separate from Asia/Pacific.
- Asia/Pacific now includes China, Hong Kong, Korea, Singapore, Taiwan, and Rest of Asia (Australia, New Zealand, India, and Southeast Asia).

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Table 1
CAD/CAM/CAE and GIS Revenue Growth Comparison (U.S. Dollars versus Local Currency for Both Europe and Japan)

Revenue by Region	1993	1994	Forecast 1999	Growth (%) 1993-1994	CAGR (%) 1994-1999
Europe ($M)					
Software Revenue	1,628.29	1,824.12	3,276.03	12.0	12.4
Hardware Revenue	2,421.88	2,604.55	5,022.05	7.5	14.0
Service Revenue	996.57	1,115.23	1,976.19	11.9	12.1
Total Factory Revenue	5,046.74	5,543.91	10,274.27	9.9	13.1
ECU/U.S.$ Exchange Rate*	0.86	0.84	0.77	-1.5	-1.8
Europe (ECU Millions)					
Software Revenue	1,394.80	1,538.83	2,522.54	10.3	10.4
Hardware Revenue	2,074.58	2,197.20	3,866.98	5.9	12.0
Service Revenue	853.67	940.81	1,521.67	10.2	10.1
Total Factory Revenue	4,323.04	4,676.84	7,911.19	8.2	11.1
Japan ($M)					
Software Revenue	1,203.33	1,315.70	2,013.89	9.3	8.9
Hardware Revenue	2,148.02	2,174.59	2,893.95	1.2	5.9
Service Revenue	756.90	813.74	1,074.17	7.5	5.7
Total Factory Revenue	4,108.24	4,304.03	5,982.01	4.8	6.8
Japan/U.S.$ Exchange Rate*	110.85	101.81	99.73	-8.2	-0.4
Japan (Yen Millions)					
Software Revenue	133,388.69	133,951.14	200,845.20	0.4	8.4
Hardware Revenue	238,107.55	221,394.71	288,613.32	-7.0	5.4
Service Revenue	83,902.25	82,847.36	107,126.86	-1.3	5.3
Total Factory Revenue	455,398.49	438,193.21	596,585.38	-3.8	6.4
North America ($M)					
Software Revenue	1,758.41	1,929.06	3,711.42	9.7	14.0
Hardware Revenue	2,345.76	2,512.99	4,526.12	7.1	12.5
Service Revenue	1,036.93	1,176.56	1,916.85	13.5	10.3
Total Factory Revenue	5,141.36	5,618.72	10,154.40	9.3	12.6
Worldwide ($M)					
Software Revenue	4,890.91	5,418.96	9,776.21	10.8	12.5
Hardware Revenue	7,351.48	7,798.97	13,510.08	6.1	11.6
Service Revenue	2,968.24	3,313.93	5,319.26	11.6	9.9
Total Factory Revenue	15,210.89	16,531.96	28,605.55	8.7	11.6

*Assuming a stable currency, the 1999 exchange rate is the September 1995 exchange rate.
Source: Dataquest (October 1995)

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Table 2
Foreign Currency versus the U.S. Dollar

		Actual				Current			Year-to-Year Change (%)					
Country	Currency	1990	1991	1992	1993	1994	1995	1996	1990-1991	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996
Austria	Schilling	11.36	11.67	10.95	11.65	11.40	10.32	10.05	2.73	-6.2	6.4	-2.1	-9.5	-2.6
Belgium	Franc	33.41	34.13	32.02	34.67	33.66	30.16	29.38	2.16	-6.2	8.3	-2.9	-10.4	-2.6
Denmark	Krone	6.18	6.39	6.02	6.49	6.35	5.70	5.54	3.40	-5.8	7.8	-2.2	-10.2	-2.8
Finland	Markka	3.82	4.04	4.45	5.73	5.21	4.39	4.27	5.76	10.1	28.8	-9.1	-15.7	-2.7
France	Franc	5.44	5.64	5.27	5.67	5.54	5.04	4.92	3.68	-6.6	7.6	-2.3	-9.0	-2.4
Germany	D-Mark	1.62	1.66	1.56	1.66	1.62	1.45	1.43	2.47	-6.0	6.4	-2.4	-10.8	-1.0
Italy	Lira	1,197.22	1,238.93	1,227.75	1,577.85	1,609.34	1,625.01	1,616.00	3.48	-0.9	28.5	2.0	1.0	-0.6
Netherlands	Guilder	1.82	1.87	1.75	1.86	1.82	1.64	1.64	2.75	-6.4	6.3	-2.2	-9.9	0.2
Norway	Krone	6.25	6.49	6.18	7.11	7.04	6.42	6.25	3.84	-4.8	15.0	-1.0	-8.8	-2.6
Spain	Peseta	102.03	103.81	101.90	127.87	133.48	125.35	123.48	1.74	-1.8	25.5	4.4	-6.1	-1.5
Sweden	Krona	5.92	6.04	5.81	7.82	7.70	7.30	6.95	2.03	-3.8	34.6	-1.5	-5.2	-4.8
Switzerland	Franc	1.39	1.43	1.40	1.48	1.37	1.20	1.16	2.88	-2.1	5.7	-7.4	-12.7	-3.0
United Kingdom	Pound	0.56	0.57	0.57	0.67	0.65	0.64	0.63	1.79	0	17.5	-3.0	-1.5	-1.6
Europe Average	ECU	0.79	0.81	0.77	0.86	0.84	0.78	0.77	2.27	-4.9	11.4	-1.5	-7.8	-1.0
China	Renminbi	4.79	5.33	5.51	5.76	8.54	8.32	8.32	11.27	3.4	4.5	48.3	-2.6	0
Hong Kong	Dollar	7.79	7.77	7.74	7.74	7.73	7.74	7.73	-0.26	-0.4	0	-0.1	0.1	-0.1
Japan	Yen	144.05	134.59	126.34	110.85	101.56	97.34	99.73	-6.57	-6.1	-12.3	-8.4	-4.2	2.5
Korea	Won	242.70	730.67	782.41	799.42	805.80	773.20	768.20	201.06	7.1	2.2	0.8	-4.0	-0.6
Singapore	Dollar	1.81	1.73	1.63	1.62	1.53	1.42	1.42	-4.42	-5.8	-0.9	-5.3	-7.2	0
Taiwan	Dollar	26.64	26.49	24.93	26.15	26.45	27.50	27.06	-0.56	-5.9	4.9	1.1	4.0	-1.6

Source: Dataquest (October 1995)

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- Service is divided into hardware service and software service.
- Platforms have been replaced by operating systems, to include UNIX, host, Windows NT and PC.

This restructuring is reflected in the forecast. The net result is a better history from which to forecast. Unfortunately, because of this restructuring, the data will not match the data in Dataquest's previously published market share documents. In addition to some shifting of revenue to allow for the restructuring, several company changes were made as follows:

- Work in the new database resulted in the loss of some companies' European and Asian revenue, most notably Altera. The revenue for these companies has been corrected and is available through your inquiry privilege.
- UniCAD had inadvertently been excluded from our market share database and was therefore not included in previously published market share documents. It has been added.
- Mentor Graphics restated its revenue for 1992 and 1993, correcting an error in its reporting by shifting revenue from the year of order to the year of sale and realigning its sales to our changed subapplication definitions.

Worldwide Forecast Assumptions

The following paragraphs describe the main forces driving the CAD/CAM/CAE and GIS worldwide software forecast.

Mechanical Forecast Assumptions

The mechanical CAD/CAM/CAE market, which grew 9.7 percent in 1994, is expected to reach a market size of $3.9 million in five years. The market will be fueled by a complex and rich blend of emerging technologies, regional growth, and new applications for CAD technology.

Emerging Technologies

Topping the list of emerging technologies is product data management. This market has clearly begun to take off, not only in Europe and the United States but in Japan and Korea as well. Within the past year, we have seen pilot programs begin to move to full-scale production, support for new client platforms (Windows NT, Windows), integration with materials resource planning (MRP) systems, and an emergence of a "lite" product data management (PDM) category. PDM will be one of the significant drivers of the mechanical CAD market through 1999. Farther down the road, we expect growth in the industry to come from other emerging technologies, including generative numerical control (NC) software, analysis, conceptual design, and simulation/optimization software.

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Regional Growth

The outlook for the European markets is brighter than it has been for the last few years. The European economy as a whole continues to emerge slowly from its recession, and many of the European industries have begun a major restructuring of their information technology (IT) investment. Tool purchases by automotive companies and their supplier bases will lead to higher growth for both software and hardware revenue in the mechanical CAD/CAM/CAE sector in Europe.

Mechanical CAD/CAM/CAE growth in Japan is expected to undergo a significant shift in platform usage over our forecast period. Currently, the UNIX platform dominates the mechanical sector in Japan, despite the fact the Japanese mechanical market still places a heavy emphasis on 2-D drafting instead of 3-D/solid modeling. We expect this drafting orientation to persist, and in the next five years we anticipate a significant shift to more Windows NT and PC-based operating systems, at the expense of UNIX. This shift will not begin in earnest until late 1996, when Japan-specific versions of mechanical software on Windows NT are more widely available.

New Applications for CAD Technology

In 1994, we saw the beginning of new applications for mechanical CAD technology. Growth is picking up in nontraditional industries (those industries outside of aerospace and automotive). We expect this trend to continue as mechanical modeling, analysis, design, and simulation software become more user-friendly. Closely linked to the use of mechanical CAD in new arenas is the availability of such software on lower-cost platforms like Windows NT and the use of object technology to create customized industry- or application-specific solutions.

AEC Forecast Assumptions

The Impact of Windows NT

Intergraph dominates the UNIX market in North America, and the company's shift to Windows NT will cause both the collapse of UNIX sales in North America and the gradual erosion of UNIX in Europe. Windows NT will get a boost in 1995, driven by frustrated PC users who demand high performance and who cannot wait for Windows 95 to solve their requirements.

Factors that should contribute to the long-term expansion of the AEC CAD market are as follows:

CAD Is Becoming a Business Requirement

Large design firms are growing at the expense of smaller firms. These large end users increasingly require their employees and suppliers to adopt automation tools in the design and construction process. Smaller design firms must increasingly buy CAD systems or risk being dropped from consideration as a partner.

CAD purchases are increasingly justified as a competitive advantage in both sales and design reviews. Electronic design data is also required

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downstream by the designer's client, from the federal government down to the small commercial developer. Also, a significant pool of untapped users still exists. The current relatively low market penetration of AEC CAD systems should allow steady worldwide growth during the next five years, despite constant volatility in demand for the buildings and infrastructure to be designed.

New Features in AEC CAD Products Are Achievable

Better, lower-cost visualization tools will be in increasing demand as sales and communication tools. Data and database functions (versus graphics functions) are increasing in importance in AEC design systems, creating opportunities to sell users significant new functionality. Some vendors will create products that foster communication in the entire design, construction, and maintenance process, products that will increase the payoff in CAD investments.

The following trends will inhibit growth in the AEC CAD industry:

Design Is Only Part of the Problem

AEC's one-design-one-build structure means CAD provides fewer economic benefits to these users than does the one-design-build-many structure of manufacturing. Construction, which is essentially a prototype build, is fraught with uncertainties and delays that are not well addressed by existing AEC systems. Design tools can only thrive in the AEC structure when they support more of the entire business problem.

Poor Cooperation among Users

Users are poorly organized to take advantage of improved products, partly because of competition between engineering constructors and partly because designs are often split among several different companies representing different and competing aspects of the design process. New approaches to the design and construction process are needed to allow users to take full advantage of CAD tools.

GIS/Mapping Forecast Assumptions

The Impact of Windows NT

Intergraph's move to Windows NT at the expense of UNIX will quickly make PC-based operating systems the dominant revenue stream in North America. In the long term, the GIS UNIX market is highly subject to erosion by Windows NT because of the appeal of better integration of GIS and Windows-based productivity tools.

Factors that should contribute to the long-term expansion of the GIS market are as follows:

There Exists an Abundant Supply of Prospective Buyers

Penetration is still moderately low among core users. Bread-and-butter prospects in government and utilities are charged with maintaining information on land and assets in perpetuity. Many of these prospective buyers are still using paper maps that will degrade over time. This creates a certain inevitability to moving from paper maps to computer-based systems.

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New Technologies Will Drive Growth

Faster, cheaper computers will be continually leveraged to support new software products. Widespread computer-industry developments in open, distributed systems supporting high-speed networking will make it possible for GIS technology to broadly expand its user base. Lower-cost, higher-resolution satellite imagery holds the potential to drive another explosion in GIS market growth among users who cannot afford aerial photography. Advances in aerial photography, global positioning systems (GPSs), and laser range finders are making it possible to create GISs significantly cheaper, more accurate, and more complete than existing paper maps, giving experienced users some compelling reasons to reinvest. Portable and pen-based computers are bringing GIS to new users in field operations.

Data Will Drive Growth

The GIS business market is driving high growth on PCs. However, we see a wide band of uncertainty surrounding the clearly growing revenue opportunity from new applications. Several new applications in GIS are destined to become relatively low-revenue producing features in other software programs (and market), rather than standalone products in the GIS market. At the same time, data is increasing in value relative to software in this low-end market.

GIS has attained a certain indispensability, particularly among federal users and in utilities. As a result, users are beginning to expect to share the data in their various GIS systems. Within three years, we expect data to be readily exchangeable across different systems. At that point, shareable data will help drive market growth.

Several factors seriously constrain the long-term expansion of the GIS market, as follows:

High Cost of Entry Remains a Barrier

There will remain an uncertain, but certainly high, cost of creating a working GIS system in traditional environments. No magic will emerge to create a low-cost, meaningful data set for mainstream customers in government and utilities. Data conversion will remain costly because the significant cost of correcting prior errors and omissions on paper maps is inevitably bundled into the cost of "conversion."

Price Pressures Inhibit Growth

Price pressure will hold down total revenue. Innovation is the only way to maintain prices in any software industry, and GIS vendors will struggle in their attempt to create compelling new applications and improved investment payoff for customers.

Electronic Design Automation

The EDA software market grew 16.8 percent in 1994. Over the next five years, growth will continue to be fueled by continually increasing design complexity and ever-higher speeds.

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Electronic CAE

The demands today's tools place on CPU processing speed and memory size are reversing the process of equalization and driving the sales of UNIX-class tools. Equalization (PC-based tools becoming more expensive as UNIX-based tools fall in price) was either caused by the stagnation of the design challenge or, more likely, the stagnation in tool development. Design complexity is forcing a large-scale swap: gate-level users are swapping up to registered transfer (RT)-level while RT-level users are swapping up to electronic system (ES)-level tools. RT-level tools will begin to appear on Windows NT, competing with the UNIX-based tools while the ES-level tools will remain UNIX-based. Meanwhile, low-end design—still manageable by PC-based tools—is shifting to Asia/Pacific and driving PC growth in that region. The main inhibitor to growth in CAE tools is the engineering learning curve.

IC Layout

The IC-layout market grew as expected, 20 percent from 1993 to 1994, after several very sleepy years. Design complexity and high speed is forcing replacement of obsolete tools, driving this high growth. This is primarily a replacement market of very high-cost tools and very few players. The ensuing frenzy for market share is the result. The few PC-based tools in this market are being replaced by UNIX-class tools in North America and Japan. Growth in the very few PC-based tools is in Europe (including eastern Europe) and Asia/Pacific. It is yet unclear whether Windows NT will be able to penetrate the IC Layout market.

PCB/MCM/Hybrid

The 3.3 percent growth in the printed circuit board (PCB) market comes as a surprise, given the forecast negative 2 percent growth from 1993 to 1994. The strong yen masked a decline in PCB growth (in yen) in Japan, where half of PCB sales are.

Organizational manufacturing models are driving changes in the PCB market. As manufacturing organizations are moving to Asia/Pacific (from both North America and Japan), the low-speed designing is following, driving PC sales in that region. In North America, Europe, and Japan, high-speed board design is moving from manufacturing into engineering departments that are traditionally UNIX-based. Where new engineering environments are being created for RT-level designs, the opportunity for Windows NT to take over both the CAE environment and the PCB environment exists.

Forecast Methodology

Fundamental to the way Dataquest conducts its research is the underlying philosophy that the best data and analyses come from a well-balanced program. This program includes the following: balance between primary and secondary collection techniques; balance between supply-side and demand-side analysis; balance between focused, industry-specific research and coordinated, "big-picture" analysis aided by integration of data from the more than 25 separate high-technology industries Dataquest covers; and balance between the perspectives of

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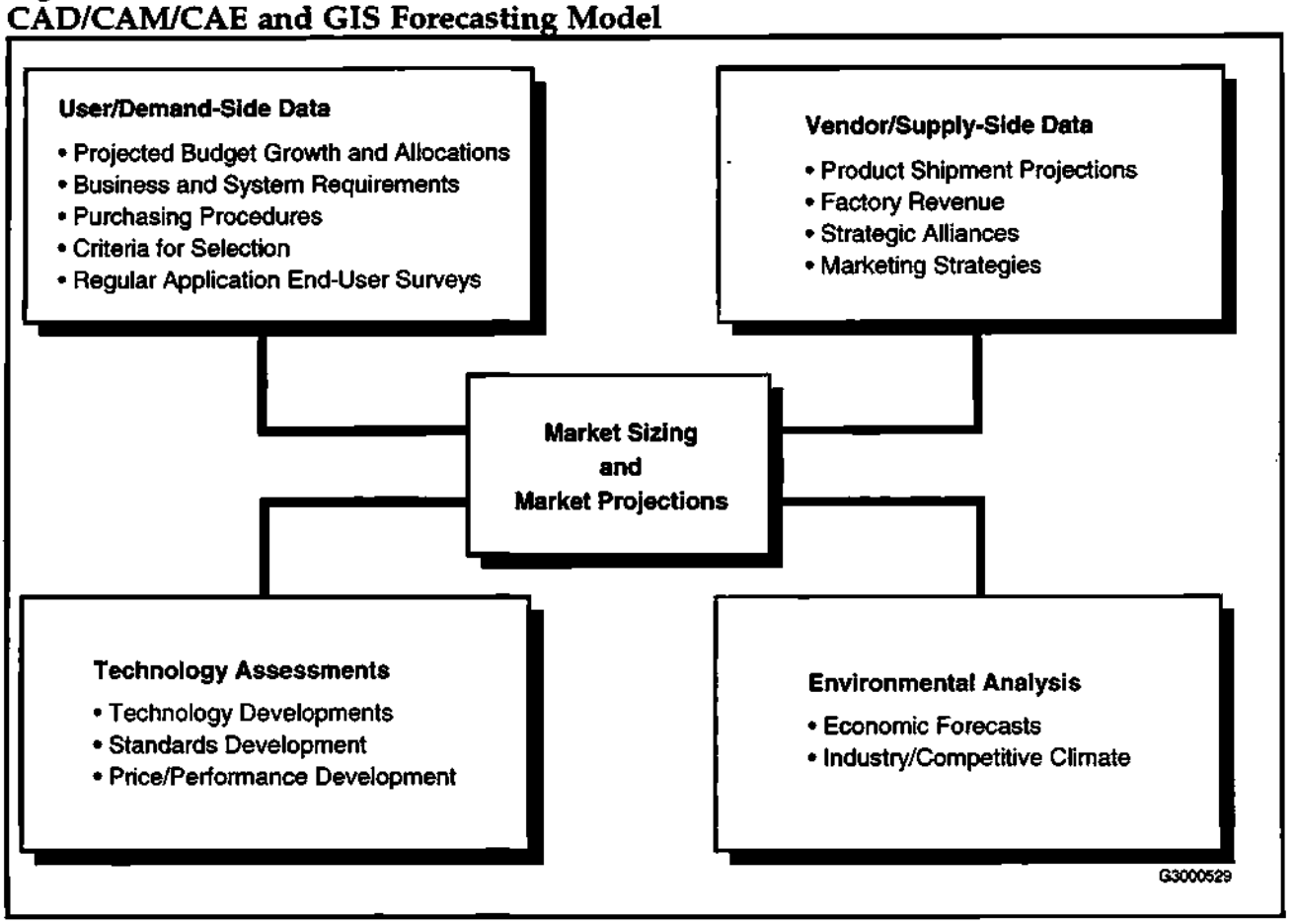
experienced industry professionals and rigorous, disciplined techniques of seasoned market researchers.

Dataquest also analyzes trends in the macro environment, which can have major influences on both supply-side and demand-side forecasting. In addition to demographics, analysts look at gross national product (GNP) growth, interest rate fluctuation, business expectations, and capital spending plans. In the geopolitical arena, the group looks at trade issues, political stability or lack thereof, tariffs, nontariff barriers, and such factors as the effect on Europe of the events of 1994.

Figure 1 shows the CAD/CAM/CAE and GIS forecasting model. The overall forecasting process uses a combination of techniques such as time series and technological modeling. Market estimates and forecasts are derived using the following research techniques:

- Segment forecasting—Individual forecasts are derived for each application segment tracked by the CAD/CAM/CAE and GIS group. Specifically, each application, segmented by region and platform, is forecast and rolled up. In this way, each application segment incorporates its own set of unique assumptions.

Figure 1
CAD/CAM/CAE and GIS Forecasting Model



Source: Dataquest (May 1995)

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- Demand-based analysis—Market growth is tracked and forecast in terms of the present and anticipated demand of current and future users. This requires the development of a total available market model and a satisfied available market figure to assess the levels of penetration accurately. Dataquest analysts also factor in the acceptance or ability for users to consume new technology.
- Capacity-based analysis—This method involves identifying future shipment volume constraints. These constraints, or "ceilings," can be the result of component availability, manufacturing capacity, or distribution capacity. In any case, capacity limitations are capable of keeping shipments below the demand level.

Segmentation Definitions

This section lists the definitions specific to this document. The following paragraphs define the segments.

Applications

- Mechanical—The mechanical segment refers to computer-aided tools used by engineers, designers, analysts, technicians, and draftspeople working predominantly in the discrete manufacturing industries, but includes government and education. Users of mechanical CAD/CAM/CAE tools work in all departments across the typical organization, with a majority found in product design, advanced engineering, and manufacturing engineering. Common design applications include conceptual design, industrial design, structural or thermal analysis, detail design, and electromechanical design (the mechanical part of design with electrical or electronic components and mechanisms). Common manufacturing applications include tool and fixture design, numerical control part programming, offline robotics programming, and interface to quality-control systems. Management tools for database control and distribution are included in this segment, as well as user-defined application programming.
- Architecture, Engineering, and Construction (AEC)—The AEC segment covers the use of computer-aided tools by architects, contractors, plant engineers, civil engineers, and other people associated with these disciplines to aid in designing and managing buildings, industrial plants, ships, and other types of nondiscrete entities.
- Geographic Information Systems (GIS)/Mapping—GIS is computer-based technology, and the segment is composed of hardware, software, and data used to capture, edit, display, and analyze spatial (tagged by location) information.
- Electronic Design Automation (EDA)—The EDA segment covers computer-based tools used to automate the process of designing an electronic product, including printed circuit boards, ICs, and systems. EDA includes ECAE, IC layout, and PCB/hybrid/MCM, as follows:
  - Electronic computer-aided engineering (ECAE)—These are computer-aided tools used in the engineering or design phase of electronic products (as opposed to the physical layout phase of the

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product). Examples of ECAE applications are schematic capture and simulation.

- IC layout—This is a software application tool used to create and validate the physical implementation of an IC. The IC layout category comprises polygon editors, symbolic editors, placement and routing (gate array, cell, and block), design verification tools (DRC/ERC/logic-to-layout), compilers, and module development tools.
- PCB/hybrid/MCM—This segment covers products used to create the placement and routing of the traces and components laid out on a printed circuit board. Also included in this category are thermal analysis tools.

Regions

The following bullets define the regions.

- North America—North America includes United States, Mexico, and Canada.
- Europe—Europe includes the United Kingdom, Scandinavia, Benelux, France, Germany, Italy, Spain, Austria/Switzerland, Russia, central Europe, and the rest of Europe.
- Japan
- Asia—Asia includes Singapore, Taiwan, Korea, China, Hong Kong, and the rest of Asia (Australia, India, and Southeast Asia).
- Rest of World—Rest of World includes all other countries and regions, including Africa, the Middle East, Central America, and South America.

Operating Systems

The following paragraphs define the operating systems.

UNIX. UNIX includes all UNIX variants and older workstation operating systems.

Host. Host includes minicomputer and mainframe operating systems in which external workstations' functions are dependent on a host computer.

Windows NT. Windows NT is the Microsoft operating system.

PC. PC includes DOS, Windows, Windows 95, OS/2, and Apple operating systems.

Line Items

Line item definitions are as follows:

- Average selling price (ASP) is defined as the average price of a product, inclusive of any discounts.
- CPU revenue is the portion of revenue derived from a system sale that is related to the value of the CPU.

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- CPU shipment is defined as the number of CPUs delivered.
- CPU installed base is defined as the total number of CPUs in active, day-to-day use.
- Unit shipment is defined as the number of products delivered (that is, seats).
- Seats are defined as the number of possible simultaneous users.
- Installed seats are defined as the total number of seats in active, day-to-day use.
- Hardware revenue is defined as the sum of the revenue from the hardware system components: CPU revenue, terminal revenue, and peripherals revenue.
- Peripherals revenue is defined as the value of all the peripherals from turnkey sale. (Peripherals in this category typically are input and output devices.)
- Terminal revenue is defined as revenue derived from the sale of terminals used to graphically create, analyze, or manipulate designs. The term is applicable only to the host systems.
- Software revenue is revenue derived from the sale of application software.
- Service revenue is defined as revenue derived from the service and support of CAD/CAM/CAE or GIS systems. Service is followed as software service and hardware service.
- Total factory revenue is defined as the amount of money received for goods measured in U.S. dollars and is the sum of hardware, software, and service revenue.

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Table A-1
CAD/CAM/CAE/GIS Software History and Forecast
Top Level Worldwide Forecast, All Applications, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
Software Revenue ($M)									
Worldwide, All Operating Systems	4,583	4,891	5,419	6,224	6,942	7,763	8,691	9,776	12.5
Worldwide									
UNIX	3,163	3,401	3,796	4,249	4,630	5,007	5,439	5,913	9.3
Windows NT	-	5	106	356	568	872	1,201	1,621	72.4
Personal Computer	1,066	1,190	1,327	1,484	1,652	1,827	2,012	2,214	10.8
Host/Proprietary	354	295	190	136	92	58	39	27	-32.1
All Operating Systems									
North America	1,599	1,759	1,929	2,170	2,480	2,863	3,279	3,711	14.0
Europe	1,668	1,628	1,824	2,178	2,410	2,650	2,926	3,276	12.4
Japan	1,117	1,203	1,316	1,445	1,563	1,694	1,840	2,014	8.9
Asia/Pacific	137	207	255	320	364	415	484	587	18.2
Rest of World	61	94	95	112	125	141	161	187	14.5
Year-to-Year Software Revenue Growth Rate (%)									
Worldwide, All Operating Systems		6.7	10.8	14.9	11.5	11.8	11.9	12.5	
Worldwide									
UNIX		7.5	11.6	11.9	9.0	8.1	8.6	8.7	
Windows NT		NA	1,950.4	234.2	59.8	53.4	37.8	35.0	
Personal Computer		11.6	11.5	11.8	11.3	10.6	10.1	10.1	
Host/Proprietary		-16.7	-35.6	-28.3	-32.5	-36.6	-32.2	-30.4	
All Operating Systems									
North America		10.0	9.7	12.5	14.3	15.5	14.5	13.2	
Europe		-2.4	12.0	19.4	10.7	10.0	10.4	12.0	
Japan		7.7	9.3	9.8	8.2	8.4	8.6	9.4	
Asia/Pacific		51.3	22.9	25.4	13.8	14.1	16.5	21.5	
Rest of World		53.2	1.7	17.7	11.5	12.6	14.6	16.3	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-1
CAD/CAM/CAE/GIS Software History and Forecast
Detail Italy Forecast, All Applications, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	17,049	16,752	18,332	NA	NA	NA	NA	NA	NA
Seats	18,144	17,254	18,622	NA	NA	NA	NA	NA	NA
Year-to-Year Increase (%)	7	-5	8	NA	NA	NA	NA	NA	
Installed Base									
CPUs	74,541	86,582	97,875	88,800	77,000	64,400	51,100	37,000	-18
Seats	83,008	95,272	106,320	96,500	83,600	69,900	55,400	40,200	-18
Year-to-Year Increase (%)	23	15	12	-9	-13	-16	-21	-27	
REVENUE DATA ($M)									
CPU Revenue	221	170	170	-	-	-	-	-	NA
Terminal Revenue	18	10	6	-	-	-	-	-	NA
Peripheral Revenue	22	12	8	-	-	-	-	-	NA
Hardware Revenue	261	192	184	-	-	-	-	-	NA
Year-to-Year Increase (%)	-5	-27	-4	NA	NA	NA	NA	NA	
Software Revenue	153	125	128	134	146	162	180	202	10
Year-to-Year Increase (%)	6	-18	2	5	9	11	11	12	
Software Service	50	43	48	-	-	-	-	-	NA
Hardware Service	52	40	34	-	-	-	-	-	NA
Service Revenue	103	83	83	-	-	-	-	-	NA
Year-to-Year Increase (%)	2	-19	0	NA	NA	NA	NA	NA	
Total Factory Revenue	517	400	396	134	146	162	180	202	-13
Year-to-Year Increase (%)	0	-23	-1	-66	9	11	11	12	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-2
CAD/CAM/CAE/GIS Software History and Forecast
Detail Italy Forecast, Mechanical, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	10,296	9,275	9,286	NA	NA	NA	NA	NA	NA
Seats	11,174	9,663	9,554	NA	NA	NA	NA	NA	NA
Year-to-Year Increase (%)	12	-14	-1	NA	NA	NA	NA	NA	
Installed Base									
CPUs	42,112	48,807	54,184	49,200	42,700	35,800	28,500	20,600	-18
Seats	48,791	55,648	60,862	55,200	47,900	40,100	31,900	23,100	-18
Year-to-Year Increase (%)	25	14	9	-9	-13	-16	-21	-27	
REVENUE DATA ($M)									
CPU Revenue	143	104	99	-	-	-	-	-	NA
Terminal Revenue	13	8	6	-	-	-	-	-	NA
Peripheral Revenue	18	9	6	-	-	-	-	-	NA
Hardware Revenue	174	121	110	-	-	-	-	-	NA
Year-to-Year Increase (%)	-5	-30	-9	NA	NA	NA	NA	NA	
Software Revenue	98	77	73	74	78	85	93	100	7
Year-to-Year Increase (%)	5	-22	-4	1	6	9	9	9	
Software Service	31	26	31	-	-	-	-	-	NA
Hardware Service	35	25	20	-	-	-	-	-	NA
Service Revenue	66	51	51	-	-	-	-	-	NA
Year-to-Year Increase (%)	-4	-22	0	NA	NA	NA	NA	NA	
Total Factory Revenue	338	249	234	74	78	85	93	100	-16
Year-to-Year Increase (%)	-2	-26	-6	-69	6	9	9	9	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-3
CAD/CAM/CAE/GIS Software History and Forecast
Detail Italy Forecast, AEC, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	3,609	3,746	4,463	NA	NA	NA	NA	NA	NA
Seats	3,683	3,774	4,472	NA	NA	NA	NA	NA	NA
Year-to-Year Increase (%)	0	2	18	NA	NA	NA	NA	NA	
Installed Base									
CPUs	14,760	17,340	20,179	18,300	15,900	13,200	10,300	7,300	-18
Seats	15,515	18,102	20,909	19,000	16,400	13,600	10,700	7,500	-18
Year-to-Year Increase (%)	22	17	16	-9	-14	-17	-22	-29	
REVENUE DATA ($M)									
CPU Revenue	28	20	22	-	-	-	-	-	NA
Terminal Revenue	2	1	0	-	-	-	-	-	NA
Peripheral Revenue	2	1	1	-	-	-	-	-	NA
Hardware Revenue	31	22	24	-	-	-	-	-	NA
Year-to-Year Increase (%)	-4	-30	8	NA	NA	NA	NA	NA	
Software Revenue	20	16	18	20	23	26	29	34	14
Year-to-Year Increase (%)	10	-22	16	12	15	13	14	15	
Software Service	5	3	3	-	-	-	-	-	NA
Hardware Service	5	3	3	-	-	-	-	-	NA
Service Revenue	10	6	6	-	-	-	-	-	NA
Year-to-Year Increase (%)	13	-38	-7	NA	NA	NA	NA	NA	
Total Factory Revenue	62	44	48	20	23	26	29	34	-7
Year-to-Year Increase (%)	3	-29	9	-58	15	13	14	15	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-4
CAD/CAM/CAE/GIS Software History and Forecast
Detail Italy Forecast, GIS/Mapping, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	1,451	1,804	2,280	NA	NA	NA	NA	NA	NA
Seats	1,560	1,898	2,306	NA	NA	NA	NA	NA	NA
Year-to-Year Increase (%)	18	22	22	NA	NA	NA	NA	NA	
Installed Base									
CPUs	6,324	7,931	9,842	9,200	8,200	7,200	5,900	4,400	-15
Seats	6,910	8,594	10,500	9,800	8,800	7,600	6,300	4,800	-15
Year-to-Year Increase (%)	28	24	22	-7	-10	-13	-18	-24	
REVENUE DATA ($M)									
CPU Revenue	26	22	26	-	-	-	-	-	NA
Terminal Revenue	1	1	0	-	-	-	-	-	NA
Peripheral Revenue	2	1	1	-	-	-	-	-	NA
Hardware Revenue	29	24	27	-	-	-	-	-	NA
Year-to-Year Increase (%)	3	-19	14	NA	NA	NA	NA	NA	
Software Revenue	18	17	19	22	25	29	33	38	15
Year-to-Year Increase (%)	13	-9	17	12	16	16	15	15	
Software Service	7	6	8	-	-	-	-	-	NA
Hardware Service	6	5	6	-	-	-	-	-	NA
Service Revenue	14	12	14	-	-	-	-	-	NA
Year-to-Year Increase (%)	32	-12	14	NA	NA	NA	NA	NA	
Total Factory Revenue	61	52	60	22	25	29	33	38	-9
Year-to-Year Increase (%)	11	-14	15	-64	16	16	15	15	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-5
CAD/CAM/CAE/GIS Software History and Forecast
Detail Italy Forecast, Electronic Design Automation, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	1,694	1,927	2,303	NA	NA	NA	NA	NA	NA
Seats	1,727	1,919	2,290	NA	NA	NA	NA	NA	NA
Year-to-Year Increase (%)	-15	11	19	NA	NA	NA	NA	NA	
Installed Base									
CPUs	11,346	12,505	13,669	12,100	10,200	8,300	6,500	4,700	-19
Seats	11,792	12,929	14,050	12,500	10,500	8,500	6,600	4,800	-19
Year-to-Year Increase (%)	13	10	9	-11	-16	-19	-22	-27	
REVENUE DATA ($M)									
CPU Revenue	25	24	23	-	-	-	-	-	NA
Terminal Revenue	2	1	0	-	-	-	-	-	NA
Peripheral Revenue	0	0	0	-	-	-	-	-	NA
Hardware Revenue	27	25	23	-	-	-	-	-	NA
Year-to-Year Increase (%)	-11	-7	-6	NA	NA	NA	NA	NA	
Software Revenue	17	17	18	19	20	22	25	30	11
Year-to-Year Increase (%)	-1	1	7	4	8	10	15	19	
Software Service	7	7	7	-	-	-	-	-	NA
Hardware Service	6	6	5	-	-	-	-	-	NA
Service Revenue	12	13	12	-	-	-	-	-	NA
Year-to-Year Increase (%)	6	5	-7	NA	NA	NA	NA	NA	
Total Factory Revenue	56	55	53	19	20	22	25	30	-11
Year-to-Year Increase (%)	-5	-2	-2	-65	8	10	15	19	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-6
CAD/CAM/CAE/GIS Software History and Forecast
Detail Italy Forecast, Electronic CAE, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	1,115	1,338	1,631	NA	NA	NA	NA	NA	NA
Seats	1,121	1,328	1,630	NA	NA	NA	NA	NA	NA
Year-to-Year Increase (%)	-15	18	23	NA	NA	NA	NA	NA	
Installed Base									
CPUs	6,683	7,575	8,529	7,600	6,500	5,300	4,100	3,000	-19
Seats	6,787	7,665	8,611	7,700	6,500	5,300	4,200	3,100	-19
Year-to-Year Increase (%)	15	13	12	-10	-15	-19	-22	-27	
REVENUE DATA ($M)									
CPU Revenue	16	17	16	-	-	-	-	-	NA
Terminal Revenue	1	0	0	-	-	-	-	-	NA
Peripheral Revenue	0	0	0	-	-	-	-	-	NA
Hardware Revenue	17	17	16	-	-	-	-	-	NA
Year-to-Year Increase (%)	1	2	-8	NA	NA	NA	NA	NA	
Software Revenue	11	12	12	12	13	14	16	19	9
Year-to-Year Increase (%)	10	7	5	0	5	7	14	19	
Software Service	4	5	5	-	-	-	-	-	NA
Hardware Service	4	4	3	-	-	-	-	-	NA
Service Revenue	8	9	8	-	-	-	-	-	NA
Year-to-Year Increase (%)	25	9	-11	NA	NA	NA	NA	NA	
Total Factory Revenue	36	38	36	12	13	14	16	19	-12
Year-to-Year Increase (%)	8	5	-4	-66	5	7	14	19	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-7
CAD/CAM/CAE/GIS Software History and Forecast
Detail Italy Forecast, IC Layout, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	87	83	98	NA	NA	NA	NA	NA	NA
Seats	90	76	89	NA	NA	NA	NA	NA	NA
Year-to-Year Increase (%)	-1	-15	17	NA	NA	NA	NA	NA	
Installed Base									
CPUs	1,113	1,195	1,276	1,100	1,000	800	700	500	-17
Seats	1,139	1,213	1,281	1,100	1,000	800	600	500	-17
Year-to-Year Increase (%)	13	7	6	-12	-15	-17	-20	-24	
REVENUE DATA ($M)									
CPU Revenue	4	3	3	-	-	-	-	-	NA
Terminal Revenue	0	0	-	-	-	-	-	-	NA
Peripheral Revenue	-	-	0	-	-	-	-	-	NA
Hardware Revenue	4	3	3	-	-	-	-	-	NA
Year-to-Year Increase (%)	-6	-22	8	NA	NA	NA	NA	NA	
Software Revenue	2	2	2	2	3	3	4	5	19
Year-to-Year Increase (%)	-1	-18	13	18	20	19	19	18	
Software Service	1	1	1	-	-	-	-	-	NA
Hardware Service	1	1	1	-	-	-	-	-	NA
Service Revenue	2	2	2	-	-	-	-	-	NA
Year-to-Year Increase (%)	-9	6	14	NA	NA	NA	NA	NA	
Total Factory Revenue	8	7	7	2	3	3	4	5	-9
Year-to-Year Increase (%)	-5	-15	11	-69	20	19	19	18	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-8
CAD/CAM/CAE/GIS Software History and Forecast
Detail Italy Forecast, PCB/MCM/Hybrid, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	492	506	575	NA	NA	NA	NA	NA	NA
Seats	516	514	571	NA	NA	NA	NA	NA	NA
Year-to-Year Increase (%)	-17	0	11	NA	NA	NA	NA	NA	
Installed Base									
CPUs	3,549	3,735	3,864	3,300	2,700	2,200	1,700	1,200	-21
Seats	3,867	4,051	4,158	3,600	3,000	2,400	1,800	1,300	-21
Year-to-Year Increase (%)	10	5	3	-13	-18	-20	-24	-29	
REVENUE DATA ($M)									
CPU Revenue	5	4	4	-	-	-	-	-	NA
Terminal Revenue	1	0	-	-	-	-	-	-	NA
Peripheral Revenue	0	0	0	-	-	-	-	-	NA
Hardware Revenue	6	5	4	-	-	-	-	-	NA
Year-to-Year Increase (%)	-34	-25	-9	NA	NA	NA	NA	NA	
Software Revenue	3	3	3	4	4	5	5	6	13
Year-to-Year Increase (%)	-25	-9	9	10	8	13	13	20	
Software Service	2	2	1	-	-	-	-	-	NA
Hardware Service	1	1	1	-	-	-	-	-	NA
Service Revenue	3	2	2	-	-	-	-	-	NA
Year-to-Year Increase (%)	-20	-10	-10	NA	NA	NA	NA	NA	
Total Factory Revenue	12	10	10	4	4	5	5	6	-8
Year-to-Year Increase (%)	-29	-17	-4	-61	8	13	13	20	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-9
CAD/CAM/CAE/GIS Software History and Forecast
Detail Italy Forecast, All Applications, UNIX

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	6,112	5,022	5,084	NA	NA	NA	NA	NA	NA
Seats	6,112	5,022	5,084	NA	NA	NA	NA	NA	NA
Year-to-Year Increase (%)	2	-18	1	NA	NA	NA	NA	NA	
Installed Base									
CPUs	25,021	29,146	32,761	30,500	27,500	23,700	19,400	14,900	-15
Seats	25,021	29,146	32,761	30,500	27,500	23,700	19,400	14,900	-15
Year-to-Year Increase (%)	28	16	12	-7	-10	-14	-18	-23	
REVENUE DATA ($M)									
CPU Revenue	141	111	107	-	-	-	-	-	NA
Terminal Revenue	-	-	-	-	-	-	-	-	NA
Peripheral Revenue	17	8	5	-	-	-	-	-	NA
Hardware Revenue	159	118	112	-	-	-	-	-	NA
Year-to-Year Increase (%)	5	-25	-5	NA	NA	NA	NA	NA	
Software Revenue	115	88	86	90	97	106	117	129	8
Year-to-Year Increase (%)	12	-24	-2	4	8	10	10	10	
Software Service	46	38	41	-	-	-	-	-	NA
Hardware Service	35	30	25	-	-	-	-	-	NA
Service Revenue	82	68	66	-	-	-	-	-	NA
Year-to-Year Increase (%)	20	-17	-3	NA	NA	NA	NA	NA	
Total Factory Revenue	355	274	264	90	97	106	117	129	-13
Year-to-Year Increase (%)	11	-23	-3	-66	8	10	10	10	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-10
CAD/CAM/CAE/GIS Software History and Forecast
Detail Italy Forecast, All Applications, NT/Hybrid

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	-	2	136	NA	NA	NA	NA	NA	NA
Seats	-	2	136	NA	NA	NA	NA	NA	NA
Year-to-Year Increase (%)	NA	NA	6,637	NA	NA	NA	NA	NA	
Installed Base									
CPUs	-	2	107	100	100	100	100	100	-4
Seats	-	2	107	100	100	100	100	100	-4
Year-to-Year Increase (%)	NA	NA	5,190	0	0	0	-5	-16	
REVENUE DATA ($M)									
CPU Revenue	-	0	2	-	-	-	-	-	NA
Terminal Revenue	-	-	-	-	-	-	-	-	NA
Peripheral Revenue	-	0	0	-	-	-	-	-	NA
Hardware Revenue	-	0	2	-	-	-	-	-	NA
Year-to-Year Increase (%)	NA	NA	5,052	NA	NA	NA	NA	NA	
Software Revenue	-	0	2	7	9	13	17	23	61
Year-to-Year Increase (%)	NA	NA	3,701	218	35	44	31	35	
Software Service	-	0	1	-	-	-	-	-	NA
Hardware Service	-	0	1	-	-	-	-	-	NA
Service Revenue	-	0	1	-	-	-	-	-	NA
Year-to-Year Increase (%)	NA	NA	6,036	NA	NA	NA	NA	NA	
Total Factory Revenue	-	0	5	7	9	13	17	23	34
Year-to-Year Increase (%)	NA	NA	4,571	27	35	44	31	35	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-11
CAD/CAM/CAE/GIS Software History and Forecast
Detail Italy Forecast, All Applications, Personal Computer

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	10,660	11,487	12,906	NA	NA	NA	NA	NA	NA
Seats	10,660	11,487	12,906	NA	NA	NA	NA	NA	NA
Year-to-Year Increase (%)	13	8	12	NA	NA	NA	NA	NA	
Installed Base									
CPUs	47,259	55,003	62,505	55,900	47,300	38,800	30,200	20,900	-20
Seats	47,259	55,003	62,505	55,900	47,300	38,800	30,200	20,900	-20
Year-to-Year Increase (%)	23	16	14	-11	-15	-18	-22	-31	
REVENUE DATA ($M)									
CPU Revenue	35	36	40	-	-	-	-	-	NA
Terminal Revenue	-	-	-	-	-	-	-	-	NA
Peripheral Revenue	3	3	2	-	-	-	-	-	NA
Hardware Revenue	38	39	42	-	-	-	-	-	NA
Year-to-Year Increase (%)	10	3	9	NA	NA	NA	NA	NA	
Software Revenue	27	30	34	34	37	41	45	49	8
Year-to-Year Increase (%)	16	10	16	-1	9	10	10	10	
Software Service	1	2	3	-	-	-	-	-	NA
Hardware Service	1	2	2	-	-	-	-	-	NA
Service Revenue	3	4	5	-	-	-	-	-	NA
Year-to-Year Increase (%)	0	62	30	NA	NA	NA	NA	NA	
Total Factory Revenue	67	73	82	34	37	41	45	49	-10
Year-to-Year Increase (%)	12	8	13	-59	9	10	10	10	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-12
CAD/CAM/CAE/GIS Software History and Forecast
Detail Italy Forecast, All Applications, Host/Proprietary

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	277	240	207	NA	NA	NA	NA	NA	NA
Seats	1,372	742	496	NA	NA	NA	NA	NA	NA
Year-to-Year Increase (%)	-14	-46	-33	NA	NA	NA	NA	NA	
Installed Base									
CPUs	2,261	2,431	2,502	2,300	2,000	1,700	1,400	1,100	-15
Seats	10,728	11,121	10,947	9,900	8,600	7,200	5,800	4,400	-17
Year-to-Year Increase (%)	13	4	-2	-9	-13	-16	-20	-25	
REVENUE DATA ($M)									
CPU Revenue	45	24	21	-	-	-	-	-	NA
Terminal Revenue	18	10	6	-	-	-	-	-	NA
Peripheral Revenue	2	1	1	-	-	-	-	-	NA
Hardware Revenue	65	34	28	-	-	-	-	-	NA
Year-to-Year Increase (%)	-27	-47	-18	NA	NA	NA	NA	NA	
Software Revenue	12	8	6	4	2	2	1	1	-34
Year-to-Year Increase (%)	-40	-30	-29	-37	-32	-34	-32	-33	
Software Service	3	3	3	-	-	-	-	-	NA
Hardware Service	16	8	6	-	-	-	-	-	NA
Service Revenue	18	10	10	-	-	-	-	-	NA
Year-to-Year Increase (%)	-38	-42	-5	NA	NA	NA	NA	NA	
Total Factory Revenue	95	53	44	4	2	2	1	1	-56
Year-to-Year Increase (%)	-31	-44	-17	-92	-32	-34	-32	-33	

NA = Not applicable

Source: Dataquest (October 1995)

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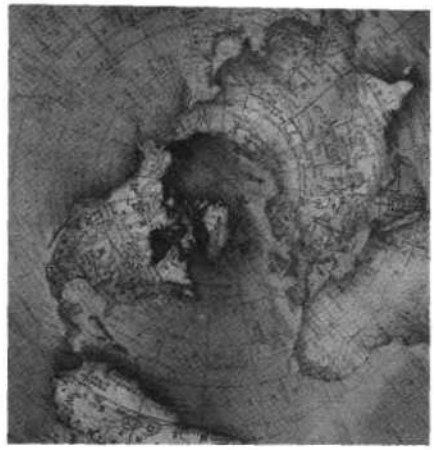
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CAD/CAM/CAE and GIS Germany Forecast Update

Market Statistics

Program: CAD/CAM/CAE/GIS Europe
Product Code: CCAM-EU-MS-9509
Publication Date: December 4, 1995
Filing: Market Analysis

CAD/CAM/CAE and GIS Germany Forecast Update



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Note: All tables show estimated data.

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CAD/CAM/CAE and GIS Germany Forecast Update

Fluctuating exchange rates once again masked the true market performance in the 1994 CAD/CAM/CAE and GIS market. Japanese CAD/CAM/CAE and GIS total factory revenue grew 4.8 percent from 1993 to 1994 when measured in U.S. dollars, contrary to what would be expected given the country's prolonged recession. However, the dollar depreciated against the yen at a rate of 8.2 percent so that when measured in yen, Japanese CAD/CAM/CAE and GIS total factory revenue declined 3.8 percent from 1993 to 1994.

Less dramatically, European CAD/CAM/CAE and GIS total factory revenue grew 9.9 percent from 1993 to 1994 when measured in U.S. dollars. With the dollar depreciating 1.5 percent, European CAD/CAM/CAE and GIS total factory revenue grew a lower 8.2 percent from 1993 to 1994 when measured in ECU. Table 1 shows the impact of currency fluctuation on the CAD/CAM/CAE and GIS software market.

Looking ahead, currency fluctuations will continue to be felt in all global markets. The dollar has continued to weaken during the early months of this year so that if we were to assume a stable currency for the remainder of the year, 1995 would end with the dollar depreciating 4.2 percent against the yen and 7.8 percent against the ECU (see Table 2). Although Dataquest does not forecast currency exchange rates, we do forecast with the best information available. The exchange rate is calculated as the simple arithmetic mean of the 12 average monthly rates for each country. For the purpose of this forecast, Dataquest assumes the September exchange rate will remain stable in the future.

This document contains Dataquest's detailed forecast information for the CAD/CAM/CAE and GIS industry. Included are the following:

- Five-year historical data
- Five-year forecast data

More detailed data is available through Dataquest's Client Inquiry service, which can provide custom analysis of the multidimensional database.

Changes to Our Forecast Structure

Dataquest's CAD/CAM/CAE and GIS forecast is based upon the updated market share data gathered before the end of 1994 and updated throughout 1995. In order to better serve you, the new CAD/CAM/CAE and GIS database has been restructured as follows:

- Japan is now tracked as a region separate from Asia/Pacific.
- Asia/Pacific now includes China, Hong Kong, Korea, Singapore, Taiwan, and Rest of Asia (Australia, New Zealand, India, and Southeast Asia).

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Table 1
CAD/CAM/CAE and GIS Revenue Growth Comparison
(U.S. Dollars versus Local Currency for Both Europe and Japan)

Revenue by Region	1993	1994	Forecast 1999	Growth (%) 1993-1994	CAGR (%) 1994-1999
Europe ($M)					
Software Revenue	1,628.29	1,824.12	3,276.03	12.0	12.4
Hardware Revenue	2,421.88	2,604.55	5,022.05	7.5	14.0
Service Revenue	996.57	1,115.23	1,976.19	11.9	12.1
Total Factory Revenue	5,046.74	5,543.91	10,274.27	9.9	13.1
ECU/U.S.$ Exchange Rate*	0.86	0.84	0.77	-1.5	-1.8
Europe (ECU Millions)					
Software Revenue	1,394.80	1,538.83	2,522.54	10.3	10.4
Hardware Revenue	2,074.58	2,197.20	3,866.98	5.9	12.0
Service Revenue	853.67	940.81	1,521.67	10.2	10.1
Total Factory Revenue	4,323.04	4,676.84	7,911.19	8.2	11.1
Japan ($M)					
Software Revenue	1,203.33	1,315.70	2,013.89	9.3	8.9
Hardware Revenue	2,148.02	2,174.59	2,893.95	1.2	5.9
Service Revenue	756.90	813.74	1,074.17	7.5	5.7
Total Factory Revenue	4,108.24	4,304.03	5,982.01	4.8	6.8
Japan/U.S.$ Exchange Rate*	110.85	101.81	99.73	-8.2	-0.4
Japan (Yen Millions)					
Software Revenue	133,388.69	133,951.14	200,845.20	0.4	8.4
Hardware Revenue	238,107.55	221,394.71	288,613.32	-7.0	5.4
Service Revenue	83,902.25	82,847.36	107,126.86	-1.3	5.3
Total Factory Revenue	455,398.49	438,193.21	596,585.38	-3.8	6.4
North America ($M)					
Software Revenue	1,758.41	1,929.06	3,711.42	9.7	14.0
Hardware Revenue	2,345.76	2,512.99	4,526.12	7.1	12.5
Service Revenue	1,036.93	1,176.56	1,916.85	13.5	10.3
Total Factory Revenue	5,141.36	5,618.72	10,154.40	9.3	12.6
Worldwide ($M)					
Software Revenue	4,890.91	5,418.96	9,776.21	10.8	12.5
Hardware Revenue	7,351.48	7,798.97	13,510.08	6.1	11.6
Service Revenue	2,968.24	3,313.93	5,319.26	11.6	9.9
Total Factory Revenue	15,210.89	16,531.96	28,605.55	8.7	11.6

*Assuming a stable currency, the 1999 exchange rate is the September 1995 exchange rate.
Source: Dataquest (October 1995)

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Table 2
Foreign Currency versus the U.S. Dollar

		Actual					Current		Year-to-Year Change (%)				
Country	Currency	1990	1991	1992	1993	1994	1995	1996	1990-1991	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996
Austria	Schilling	11.36	11.67	10.95	11.65	11.40	10.32	10.05	2.73	-6.2	6.4	-2.1	-9.5	-2.6
Belgium	Franc	33.41	34.13	32.02	34.67	33.66	30.16	29.38	2.16	-6.2	8.3	-2.9	-10.4	-2.6
Denmark	Krone	6.18	6.39	6.02	6.49	6.35	5.70	5.54	3.40	-5.8	7.8	-2.2	-10.2	-2.8
Finland	Markka	3.82	4.04	4.45	5.73	5.21	4.39	4.27	5.76	10.1	28.8	-9.1	-15.7	-2.7
France	Franc	5.44	5.64	5.27	5.67	5.54	5.04	4.92	3.68	-6.6	7.6	-2.3	-9.0	-2.4
Germany	D-Mark	1.62	1.66	1.56	1.66	1.62	1.45	1.43	2.47	-6.0	6.4	-2.4	-10.8	-1.0
Italy	Lira	1,197.22	1,238.93	1,227.75	1,577.85	1,609.34	1,625.01	1,616.00	3.48	-0.9	28.5	2.0	1.0	-0.6
Netherlands	Guilder	1.82	1.87	1.75	1.86	1.82	1.64	1.64	2.75	-6.4	6.3	-2.2	-9.9	0.2
Norway	Krone	6.25	6.49	6.18	7.11	7.04	6.42	6.25	3.84	-4.8	15.0	-1.0	-8.8	-2.6
Spain	Peseta	102.03	103.81	101.90	127.87	133.48	125.35	123.48	1.74	-1.8	25.5	4.4	-6.1	-1.5
Sweden	Krona	5.92	6.04	5.81	7.82	7.70	7.30	6.95	2.03	-3.8	34.6	-1.5	-5.2	-4.8
Switzerland	Franc	1.39	1.43	1.40	1.48	1.37	1.20	1.16	2.88	-2.1	5.7	-7.4	-12.7	-3.0
United Kingdom	Pound	0.56	0.57	0.57	0.67	0.65	0.64	0.63	1.79	0	17.5	-3.0	-1.5	-1.6
Europe Average	ECU	0.79	0.81	0.77	0.86	0.84	0.78	0.77	2.27	-4.9	11.4	-1.5	-7.8	-1.0
China	Renminbi	4.79	5.33	5.51	5.76	8.54	8.32	8.32	11.27	3.4	4.5	48.3	-2.6	0
Hong Kong	Dollar	7.79	7.77	7.74	7.74	7.73	7.74	7.73	-0.26	-0.4	0	-0.1	0.1	-0.1
Japan	Yen	144.05	134.59	126.34	110.85	101.56	97.34	99.73	-6.57	-6.1	-12.3	-8.4	-4.2	2.5
Korea	Won	242.70	730.67	782.41	799.42	805.80	773.20	768.20	201.06	7.1	2.2	0.8	-4.0	-0.6
Singapore	Dollar	1.81	1.73	1.63	1.62	1.53	1.42	1.42	-4.42	-5.8	-0.9	-5.3	-7.2	0
Taiwan	Dollar	26.64	26.49	24.93	26.15	26.45	27.50	27.06	-0.56	-5.9	4.9	1.1	4.0	-1.6

Source: Dataquest (October 1995)

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- Service is divided into hardware service and software service.
- Platforms have been replaced by operating systems, to include UNIX, host, Windows NT and PC.

This restructuring is reflected in the forecast. The net result is a better history from which to forecast. Unfortunately, because of this restructuring, the data will not match the data in Dataquest's previously published market share documents. In addition to some shifting of revenue to allow for the restructuring, several company changes were made as follows:

- Work in the new database resulted in the loss of some companies' European and Asian revenue, most notably Altera. The revenue for these companies has been corrected and is available through your inquiry privilege.
- UniCAD had inadvertently been excluded from our market share database and was therefore not included in previously published market share documents. It has been added.
- Mentor Graphics restated its revenue for 1992 and 1993, correcting an error in its reporting by shifting revenue from the year of order to the year of sale and realigning its sales to our changed subapplication definitions.

Worldwide Forecast Assumptions

The following paragraphs describe the main forces driving the CAD/CAM/CAE and GIS worldwide software forecast.

Mechanical Forecast Assumptions

The mechanical CAD/CAM/CAE market, which grew 9.7 percent in 1994, is expected to reach a market size of $3.9 million in five years. The market will be fueled by a complex and rich blend of emerging technologies, regional growth, and new applications for CAD technology.

Emerging Technologies

Topping the list of emerging technologies is product data management. This market has clearly begun to take off, not only in Europe and the United States but in Japan and Korea as well. Within the past year, we have seen pilot programs begin to move to full-scale production, support for new client platforms (Windows NT, Windows), integration with materials resource planning (MRP) systems, and an emergence of a "lite" product data management (PDM) category. PDM will be one of the significant drivers of the mechanical CAD market through 1999. Farther down the road, we expect growth in the industry to come from other emerging technologies, including generative numerical control (NC) software, analysis, conceptual design, and simulation/optimization software.

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Regional Growth

The outlook for the European markets is brighter than it has been for the last few years. The European economy as a whole continues to emerge slowly from its recession, and many of the European industries have begun a major restructuring of their information technology (IT) investment. Tool purchases by automotive companies and their supplier bases will lead to higher growth for both software and hardware revenue in the mechanical CAD/CAM/CAE sector in Europe.

Mechanical CAD/CAM/CAE growth in Japan is expected to undergo a significant shift in platform usage over our forecast period. Currently, the UNIX platform dominates the mechanical sector in Japan, despite the fact the Japanese mechanical market still places a heavy emphasis on 2-D drafting instead of 3-D/solid modeling. We expect this drafting orientation to persist, and in the next five years we anticipate a significant shift to more Windows NT and PC-based operating systems, at the expense of UNIX. This shift will not begin in earnest until late 1996, when Japan-specific versions of mechanical software on Windows NT are more widely available.

New Applications for CAD Technology

In 1994, we saw the beginning of new applications for mechanical CAD technology. Growth is picking up in nontraditional industries (those industries outside of aerospace and automotive). We expect this trend to continue as mechanical modeling, analysis, design, and simulation software become more user-friendly. Closely linked to the use of mechanical CAD in new arenas is the availability of such software on lower-cost platforms like Windows NT and the use of object technology to create customized industry- or application-specific solutions.

AEC Forecast Assumptions

The Impact of Windows NT

Intergraph dominates the UNIX market in North America, and the company's shift to Windows NT will cause both the collapse of UNIX sales in North America and the gradual erosion of UNIX in Europe. Windows NT will get a boost in 1995, driven by frustrated PC users who demand high performance and who cannot wait for Windows 95 to solve their requirements.

Factors that should contribute to the long-term expansion of the AEC CAD market are as follows:

CAD Is Becoming a Business Requirement

Large design firms are growing at the expense of smaller firms. These large end users increasingly require their employees and suppliers to adopt automation tools in the design and construction process. Smaller design firms must increasingly buy CAD systems or risk being dropped from consideration as a partner.

CAD purchases are increasingly justified as a competitive advantage in both sales and design reviews. Electronic design data is also required

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downstream by the designer's client, from the federal government down to the small commercial developer. Also, a significant pool of untapped users still exists. The current relatively low market penetration of AEC CAD systems should allow steady worldwide growth during the next five years, despite constant volatility in demand for the buildings and infrastructure to be designed.

New Features in AEC CAD Products Are Achievable

Better, lower-cost visualization tools will be in increasing demand as sales and communication tools. Data and database functions (versus graphics functions) are increasing in importance in AEC design systems, creating opportunities to sell users significant new functionality. Some vendors will create products that foster communication in the entire design, construction, and maintenance process, products that will increase the payoff in CAD investments.

The following trends will inhibit growth in the AEC CAD industry:

Design Is Only Part of the Problem

AEC's one-design-one-build structure means CAD provides fewer economic benefits to these users than does the one-design-build-many structure of manufacturing. Construction, which is essentially a prototype build, is fraught with uncertainties and delays that are not well addressed by existing AEC systems. Design tools can only thrive in the AEC structure when they support more of the entire business problem.

Poor Cooperation among Users

Users are poorly organized to take advantage of improved products, partly because of competition between engineering constructors and partly because designs are often split among several different companies representing different and competing aspects of the design process. New approaches to the design and construction process are needed to allow users to take full advantage of CAD tools.

GIS/Mapping Forecast Assumptions

The Impact of Windows NT

Intergraph's move to Windows NT at the expense of UNIX will quickly make PC-based operating systems the dominant revenue stream in North America. In the long term, the GIS UNIX market is highly subject to erosion by Windows NT because of the appeal of better integration of GIS and Windows-based productivity tools.

Factors that should contribute to the long-term expansion of the GIS market are as follows:

There Exists an Abundant Supply of Prospective Buyers

Penetration is still moderately low among core users. Bread-and-butter prospects in government and utilities are charged with maintaining information on land and assets in perpetuity. Many of these prospective buyers are still using paper maps that will degrade over time. This creates a certain inevitability to moving from paper maps to computer-based systems.

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New Technologies Will Drive Growth

Faster, cheaper computers will be continually leveraged to support new software products. Widespread computer-industry developments in open, distributed systems supporting high-speed networking will make it possible for GIS technology to broadly expand its user base. Lower-cost, higher-resolution satellite imagery holds the potential to drive another explosion in GIS market growth among users who cannot afford aerial photography. Advances in aerial photography, global positioning systems (GPSs), and laser range finders are making it possible to create GISs significantly cheaper, more accurate, and more complete than existing paper maps, giving experienced users some compelling reasons to reinvest. Portable and pen-based computers are bringing GIS to new users in field operations.

Data Will Drive Growth

The GIS business market is driving high growth on PCs. However, we see a wide band of uncertainty surrounding the clearly growing revenue opportunity from new applications. Several new applications in GIS are destined to become relatively low-revenue producing features in other software programs (and market), rather than standalone products in the GIS market. At the same time, data is increasing in value relative to software in this low-end market.

GIS has attained a certain indispensability, particularly among federal users and in utilities. As a result, users are beginning to expect to share the data in their various GIS systems. Within three years, we expect data to be readily exchangeable across different systems. At that point, shareable data will help drive market growth.

Several factors seriously constrain the long-term expansion of the GIS market, as follows:

High Cost of Entry Remains a Barrier

There will remain an uncertain, but certainly high, cost of creating a working GIS system in traditional environments. No magic will emerge to create a low-cost, meaningful data set for mainstream customers in government and utilities. Data conversion will remain costly because the significant cost of correcting prior errors and omissions on paper maps is inevitably bundled into the cost of "conversion."

Price Pressures Inhibit Growth

Price pressure will hold down total revenue. Innovation is the only way to maintain prices in any software industry, and GIS vendors will struggle in their attempt to create compelling new applications and improved investment payoff for customers.

Electronic Design Automation

The EDA software market grew 16.8 percent in 1994. Over the next five years, growth will continue to be fueled by continually increasing design complexity and ever-higher speeds.

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Electronic CAE

The demands today's tools place on CPU processing speed and memory size are reversing the process of equalization and driving the sales of UNIX-class tools. Equalization (PC-based tools becoming more expensive as UNIX-based tools fall in price) was either caused by the stagnation of the design challenge or, more likely, the stagnation in tool development. Design complexity is forcing a large-scale swap: gate-level users are swapping up to registered transfer (RT)-level while RT-level users are swapping up to electronic system (ES)-level tools. RT-level tools will begin to appear on Windows NT, competing with the UNIX-based tools while the ES-level tools will remain UNIX-based. Meanwhile, low-end design—still manageable by PC-based tools—is shifting to Asia/Pacific and driving PC growth in that region. The main inhibitor to growth in CAE tools is the engineering learning curve.

IC Layout

The IC-layout market grew as expected, 20 percent from 1993 to 1994, after several very sleepy years. Design complexity and high speed is forcing replacement of obsolete tools, driving this high growth. This is primarily a replacement market of very high-cost tools and very few players. The ensuing frenzy for market share is the result. The few PC-based tools in this market are being replaced by UNIX-class tools in North America and Japan. Growth in the very few PC-based tools is in Europe (including eastern Europe) and Asia/Pacific. It is yet unclear whether Windows NT will be able to penetrate the IC Layout market.

PCB/MCM/Hybrid

The 3.3 percent growth in the printed circuit board (PCB) market comes as a surprise, given the forecast negative 2 percent growth from 1993 to 1994. The strong yen masked a decline in PCB growth (in yen) in Japan, where half of PCB sales are.

Organizational manufacturing models are driving changes in the PCB market. As manufacturing organizations are moving to Asia/Pacific (from both North America and Japan), the low-speed designing is following, driving PC sales in that region. In North America, Europe, and Japan, high-speed board design is moving from manufacturing into engineering departments that are traditionally UNIX-based. Where new engineering environments are being created for RT-level designs, the opportunity for Windows NT to take over both the CAE environment and the PCB environment exists.

Forecast Methodology

Fundamental to the way Dataquest conducts its research is the underlying philosophy that the best data and analyses come from a well-balanced program. This program includes the following: balance between primary and secondary collection techniques; balance between supply-side and demand-side analysis; balance between focused, industry-specific research and coordinated, "big-picture" analysis aided by integration of data from the more than 25 separate high-technology industries Dataquest covers; and balance between the perspectives of

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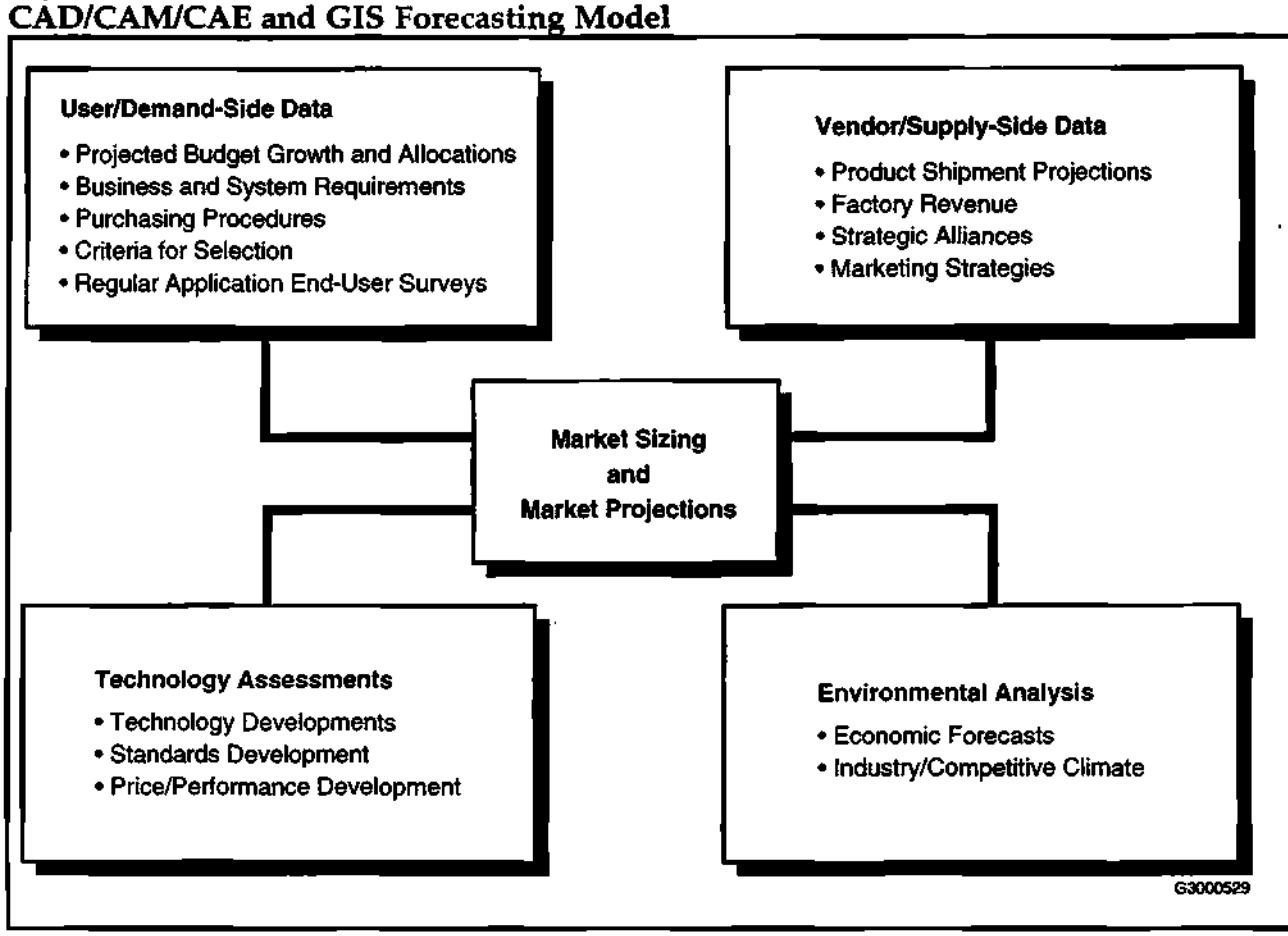
experienced industry professionals and rigorous, disciplined techniques of seasoned market researchers.

Dataquest also analyzes trends in the macro environment, which can have major influences on both supply-side and demand-side forecasting. In addition to demographics, analysts look at gross national product (GNP) growth, interest rate fluctuation, business expectations, and capital spending plans. In the geopolitical arena, the group looks at trade issues, political stability or lack thereof, tariffs, nontariff barriers, and such factors as the effect on Europe of the events of 1994.

Figure 1 shows the CAD/CAM/CAE and GIS forecasting model. The overall forecasting process uses a combination of techniques such as time series and technological modeling. Market estimates and forecasts are derived using the following research techniques:

- Segment forecasting—Individual forecasts are derived for each application segment tracked by the CAD/CAM/CAE and GIS group. Specifically, each application, segmented by region and platform, is forecast and rolled up. In this way, each application segment incorporates its own set of unique assumptions.

Figure 1
CAD/CAM/CAE and GIS Forecasting Model



Source: Dataquest (May 1995)

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- Demand-based analysis—Market growth is tracked and forecast in terms of the present and anticipated demand of current and future users. This requires the development of a total available market model and a satisfied available market figure to assess the levels of penetration accurately. Dataquest analysts also factor in the acceptance or ability for users to consume new technology.
- Capacity-based analysis—This method involves identifying future shipment volume constraints. These constraints, or "ceilings," can be the result of component availability, manufacturing capacity, or distribution capacity. In any case, capacity limitations are capable of keeping shipments below the demand level.

Segmentation Definitions

This section lists the definitions specific to this document. The following paragraphs define the segments.

Applications

- Mechanical—The mechanical segment refers to computer-aided tools used by engineers, designers, analysts, technicians, and draftspeople working predominantly in the discrete manufacturing industries, but includes government and education. Users of mechanical CAD/CAM/CAE tools work in all departments across the typical organization, with a majority found in product design, advanced engineering, and manufacturing engineering. Common design applications include conceptual design, industrial design, structural or thermal analysis, detail design, and electromechanical design (the mechanical part of design with electrical or electronic components and mechanisms). Common manufacturing applications include tool and fixture design, numerical control part programming, offline robotics programming, and interface to quality-control systems. Management tools for database control and distribution are included in this segment, as well as user-defined application programming.
- Architecture, Engineering, and Construction (AEC)—The AEC segment covers the use of computer-aided tools by architects, contractors, plant engineers, civil engineers, and other people associated with these disciplines to aid in designing and managing buildings, industrial plants, ships, and other types of nondiscrete entities.
- Geographic Information Systems (GIS)/Mapping—GIS is computer-based technology, and the segment is composed of hardware, software, and data used to capture, edit, display, and analyze spatial (tagged by location) information.
- Electronic Design Automation (EDA)—The EDA segment covers computer-based tools used to automate the process of designing an electronic product, including printed circuit boards, ICs, and systems. EDA includes ECAE, IC layout, and PCB/hybrid/MCM, as follows:
  - Electronic computer-aided engineering (ECAE)—These are computer-aided tools used in the engineering or design phase of electronic products (as opposed to the physical layout phase of the

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product). Examples of ECAE applications are schematic capture and simulation.

- IC layout—This is a software application tool used to create and validate the physical implementation of an IC. The IC layout category comprises polygon editors, symbolic editors, placement and routing (gate array, cell, and block), design verification tools (DRC/ERC/logic-to-layout), compilers, and module development tools.
- PCB/hybrid/MCM—This segment covers products used to create the placement and routing of the traces and components laid out on a printed circuit board. Also included in this category are thermal analysis tools.

Regions

The following bullets define the regions.

- North America—North America includes United States, Mexico, and Canada.
- Europe—Europe includes the United Kingdom, Scandinavia, Benelux, France, Germany, Italy, Spain, Austria/Switzerland, Russia, central Europe, and the rest of Europe.
- Japan
- Asia—Asia includes Singapore, Taiwan, Korea, China, Hong Kong, and the rest of Asia (Australia, India, and Southeast Asia).
- Rest of World—Rest of World includes all other countries and regions, including Africa, the Middle East, Central America, and South America.

Operating Systems

The following paragraphs define the operating systems.

UNIX. UNIX includes all UNIX variants and older workstation operating systems.

Host. Host includes minicomputer and mainframe operating systems in which external workstations' functions are dependent on a host computer.

Windows NT. Windows NT is the Microsoft operating system.

PC. PC includes DOS, Windows, Windows 95, OS/2, and Apple operating systems.

Line Items

Line item definitions are as follows:

- Average selling price (ASP) is defined as the average price of a product, inclusive of any discounts.
- CPU revenue is the portion of revenue derived from a system sale that is related to the value of the CPU.

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- CPU shipment is defined as the number of CPUs delivered.
- CPU installed base is defined as the total number of CPUs in active, day-to-day use.
- Unit shipment is defined as the number of products delivered (that is, seats).
- Seats are defined as the number of possible simultaneous users.
- Installed seats are defined as the total number of seats in active, day-to-day use.
- Hardware revenue is defined as the sum of the revenue from the hardware system components: CPU revenue, terminal revenue, and peripherals revenue.
- Peripherals revenue is defined as the value of all the peripherals from turnkey sale. (Peripherals in this category typically are input and output devices.)
- Terminal revenue is defined as revenue derived from the sale of terminals used to graphically create, analyze, or manipulate designs. The term is applicable only to the host systems.
- Software revenue is revenue derived from the sale of application software.
- Service revenue is defined as revenue derived from the service and support of CAD/CAM/CAE or GIS systems. Service is followed as software service and hardware service.
- Total factory revenue is defined as the amount of money received for goods measured in U.S. dollars and is the sum of hardware, software, and service revenue.

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Table A-1
CAD/CAM/CAE/GIS Software History and Forecast
Top Level Worldwide Forecast, All Applications, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
Software Revenue ($M)									
Worldwide, All Operating Systems	4,583	4,891	5,419	6,224	6,942	7,763	8,691	9,776	12.5
Worldwide									
UNIX	3,163	3,401	3,796	4,249	4,630	5,007	5,439	5,913	9.3
Windows NT	-	5	106	356	568	872	1,201	1,621	72.4
Personal Computer	1,066	1,190	1,327	1,484	1,652	1,827	2,012	2,214	10.8
Host/Proprietary	354	295	190	136	92	58	39	27	-32.1
All Operating Systems									
North America	1,599	1,759	1,929	2,170	2,480	2,863	3,279	3,711	14.0
Europe	1,668	1,628	1,824	2,178	2,410	2,650	2,926	3,276	12.4
Japan	1,117	1,203	1,316	1,445	1,563	1,694	1,840	2,014	8.9
Asia/Pacific	137	207	255	320	364	415	484	587	18.2
Rest of World	61	94	95	112	125	141	161	187	14.5
Year-to-Year Software Revenue Growth Rate (%)									
Worldwide, All Operating Systems		6.7	10.8	14.9	11.5	11.8	11.9	12.5	
Worldwide									
UNIX		7.5	11.6	11.9	9.0	8.1	8.6	8.7	
Windows NT		NA	1,950.4	234.2	59.8	53.4	37.8	35.0	
Personal Computer		11.6	11.5	11.8	11.3	10.6	10.1	10.1	
Host/Proprietary		-16.7	-35.6	-28.3	-32.5	-36.6	-32.2	-30.4	
All Operating Systems									
North America		10.0	9.7	12.5	14.3	15.5	14.5	13.2	
Europe		-2.4	12.0	19.4	10.7	10.0	10.4	12.0	
Japan		7.7	9.3	9.8	8.2	8.4	8.6	9.4	
Asia/Pacific		51.3	22.9	25.4	13.8	14.1	16.5	21.5	
Rest of World		53.2	1.7	17.7	11.5	12.6	14.6	16.3	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-1
CAD/CAM/CAE/GIS Software History and Forecast
Detail Germany Forecast, All Applications, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	84,714	92,701	99,084	119,800	135,000	147,600	162,800	181,000	13
Seats	88,487	95,296	101,591	121,900	136,700	148,800	163,700	181,700	12
Year-to-Year Increase (%)	19	8	7	20	12	9	10	11	
Installed Base									
CPUs	298,364	348,870	402,223	461,300	519,700	575,000	620,700	657,700	10
Seats	314,875	364,409	416,803	474,500	531,600	586,400	632,000	669,000	10
Year-to-Year Increase (%)	20	16	14	14	12	10	8	6	
REVENUE DATA ($M)									
CPU Revenue	864	795	877	1,049	1,173	1,282	1,399	1,561	12
Terminal Revenue	57	42	45	34	27	20	16	13	-22
Peripheral Revenue	92	56	52	58	57	57	56	57	2
Hardware Revenue	1,012	893	973	1,141	1,257	1,359	1,471	1,631	11
Year-to-Year Increase (%)	-1	-12	9	17	10	8	8	11	
Software Revenue	623	603	680	823	910	987	1,083	1,202	12
Year-to-Year Increase (%)	10	-3	13	21	11	8	10	11	
Software Service	188	186	228	273	295	307	323	342	8
Hardware Service	194	172	173	201	212	222	236	256	8
Service Revenue	382	358	401	474	507	529	559	598	8
Year-to-Year Increase (%)	12	-6	12	18	7	4	6	7	
Total Factory Revenue	2,017	1,854	2,054	2,438	2,675	2,875	3,113	3,431	11
Year-to-Year Increase (%)	5	-8	11	19	10	7	8	10	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-2
CAD/CAM/CAE/GIS Software History and Forecast
Detail Germany Forecast, Mechanical, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	32,320	31,619	34,762	42,000	46,200	49,600	53,000	56,900	10
Seats	35,170	33,371	36,728	43,800	47,600	50,600	53,700	57,300	9
Year-to-Year Increase (%)	9	-5	10	19	9	6	6	7	
Installed Base									
CPUs	117,014	132,562	149,868	169,100	187,300	205,400	220,200	229,300	9
Seats	129,245	143,889	160,622	179,100	196,500	214,300	229,000	238,100	8
Year-to-Year Increase (%)	19	11	12	12	10	9	7	4	
REVENUE DATA ($M)									
CPU Revenue	444	392	431	521	565	598	632	675	9
Terminal Revenue	42	32	36	29	22	16	11	8	-26
Peripheral Revenue	62	36	32	34	33	31	29	27	-4
Hardware Revenue	547	459	499	584	620	644	672	710	7
Year-to-Year Increase (%)	-6	-16	9	17	6	4	4	6	
Software Revenue	305	291	326	402	440	469	501	537	10
Year-to-Year Increase (%)	3	-5	12	23	9	7	7	7	
Software Service	95	95	130	162	174	177	181	183	7
Hardware Service	114	96	93	111	114	116	118	122	6
Service Revenue	208	191	223	272	288	293	299	305	6
Year-to-Year Increase (%)	-1	-8	17	22	6	2	2	2	
Total Factory Revenue	1,060	941	1,049	1,259	1,348	1,406	1,471	1,552	8
Year-to-Year Increase (%)	-2	-11	11	20	7	4	5	5	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-3
CAD/CAM/CAE/GIS Software History and Forecast
Detail Germany Forecast, AEC, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	34,213	40,488	42,824	53,200	60,900	66,000	72,600	79,900	13
Seats	34,545	40,729	42,898	53,200	60,900	66,000	72,600	79,900	13
Year-to-Year Increase (%)	47	18	5	24	14	8	10	10	
Installed Base									
CPUs	100,354	127,638	155,076	185,400	216,000	241,700	260,600	274,600	12
Seats	101,961	129,137	156,294	186,400	216,700	242,300	261,100	275,100	12
Year-to-Year Increase (%)	33	27	21	19	16	12	8	5	
REVENUE DATA ($M)									
CPU Revenue	213	198	231	294	346	382	419	460	15
Terminal Revenue	5	4	1	0	0	0	0	0	-34
Peripheral Revenue	22	14	14	17	18	18	19	19	7
Hardware Revenue	240	216	245	312	364	401	438	479	14
Year-to-Year Increase (%)	34	-10	13	27	17	10	9	9	
Software Revenue	162	155	184	232	263	283	312	343	13
Year-to-Year Increase (%)	47	-5	19	27	13	8	10	10	
Software Service	31	26	28	36	41	43	46	50	12
Hardware Service	35	29	36	44	49	52	57	62	12
Service Revenue	67	56	64	80	90	95	104	112	12
Year-to-Year Increase (%)	54	-16	15	25	12	6	9	8	
Total Factory Revenue	469	427	493	624	717	779	854	934	14
Year-to-Year Increase (%)	41	-9	16	27	15	9	10	9	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-4
CAD/CAM/CAE/GIS Software History and Forecast
Detail Germany Forecast, GIS/Mapping, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	5,495	7,072	9,820	12,300	14,500	17,000	19,500	22,300	18
Seats	5,974	7,637	10,157	12,400	14,500	17,000	19,500	22,300	17
Year-to-Year Increase (%)	15	28	33	22	17	17	15	14	
Installed Base									
CPUs	20,071	24,663	31,712	40,100	49,600	59,200	67,300	75,400	19
Seats	21,708	26,563	33,627	41,800	50,900	60,400	68,400	76,300	18
Year-to-Year Increase (%)	22	22	27	24	22	19	13	12	
REVENUE DATA ($M)									
CPU Revenue	75	76	98	113	125	142	155	171	12
Terminal Revenue	5	3	3	1	0	0	0	0	-69
Peripheral Revenue	6	6	5	5	6	6	6	7	7
Hardware Revenue	85	85	106	119	131	148	161	177	11
Year-to-Year Increase (%)	-20	0	25	12	10	13	9	10	
Software Revenue	58	62	79	92	102	113	124	136	12
Year-to-Year Increase (%)	-2	8	27	17	10	11	10	10	
Software Service	26	26	30	32	33	34	35	35	4
Hardware Service	17	18	21	22	23	25	26	27	6
Service Revenue	43	44	50	54	56	58	61	63	5
Year-to-Year Increase (%)	28	3	14	7	3	5	4	4	
Total Factory Revenue	185	191	235	265	289	319	346	376	10
Year-to-Year Increase (%)	-7	3	23	13	9	10	8	9	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-5
CAD/CAM/CAE/GIS Software History and Forecast
Detail Germany Forecast, Electronic Design Automation, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	12,685	13,522	11,678	12,300	13,400	15,100	17,700	22,000	13
Seats	12,799	13,558	11,808	12,500	13,600	15,300	17,800	22,200	13
Year-to-Year Increase (%)	-5	6	-13	6	9	13	17	24	
Installed Base									
CPUs	60,926	64,007	65,566	66,600	66,900	68,700	72,600	78,400	4
Seats	61,961	64,819	66,260	67,300	67,500	69,400	73,400	79,500	4
Year-to-Year Increase (%)	7	5	2	2	0	3	6	8	
REVENUE DATA ($M)									
CPU Revenue	133	129	117	122	137	160	193	256	17
Terminal Revenue	5	3	4	4	4	4	5	5	2
Peripheral Revenue	2	1	1	1	1	2	2	4	31
Hardware Revenue	140	133	123	127	142	166	200	264	17
Year-to-Year Increase (%)	-11	-5	-8	3	12	17	20	32	
Software Revenue	98	95	91	95	106	122	146	187	16
Year-to-Year Increase (%)	-1	-3	-5	5	11	16	20	28	
Software Service	37	38	40	44	48	53	61	74	13
Hardware Service	28	28	23	24	26	30	35	45	14
Service Revenue	64	66	63	67	73	83	96	119	13
Year-to-Year Increase (%)	18	3	-5	6	9	13	16	23	
Total Factory Revenue	302	295	277	289	321	371	442	569	16
Year-to-Year Increase (%)	-3	-3	-6	5	11	16	19	29	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-6
CAD/CAM/CAE/GIS Software History and Forecast
Detail Germany Forecast, Electronic CAE, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	8,803	10,104	9,206	9,600	10,200	11,000	12,500	15,600	11
Seats	8,829	10,104	9,228	9,600	10,200	11,000	12,500	15,600	11
Year-to-Year Increase (%)	-10	14	-9	4	6	9	14	24	
Installed Base									
CPUs	39,326	43,342	46,204	48,300	49,300	50,400	52,300	55,800	4
Seats	39,611	43,543	46,354	48,400	49,400	50,400	52,400	55,900	4
Year-to-Year Increase (%)	11	10	6	4	2	2	4	7	
REVENUE DATA ($M)									
CPU Revenue	91	95	87	90	99	112	132	177	15
Terminal Revenue	2	1	1	1	1	0	0	0	-13
Peripheral Revenue	2	1	1	1	1	1	1	2	24
Hardware Revenue	94	98	88	91	100	114	134	179	15
Year-to-Year Increase (%)	-7	4	-10	3	10	13	18	34	
Software Revenue	67	70	68	70	76	85	100	128	14
Year-to-Year Increase (%)	-1	5	-4	3	9	12	17	29	
Software Service	24	26	27	29	31	33	37	45	10
Hardware Service	19	21	17	17	18	20	23	29	12
Service Revenue	43	47	44	46	49	54	61	74	11
Year-to-Year Increase (%)	25	9	-5	4	7	9	13	22	
Total Factory Revenue	204	215	200	206	225	252	294	381	14
Year-to-Year Increase (%)	0	5	-7	3	9	12	17	30	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-7
CAD/CAM/CAE/GIS Software History and Forecast
Detail Germany Forecast, IC Layout, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	409	372	415	500	500	700	800	900	18
Seats	422	352	388	500	500	700	800	900	19
Year-to-Year Increase (%)	11	-17	10	17	19	20	20	20	
Installed Base									
CPUs	2,107	2,171	2,316	2,500	2,700	3,100	3,500	4,000	12
Seats	2,102	2,142	2,265	2,500	2,700	3,000	3,500	4,000	12
Year-to-Year Increase (%)	4	2	6	8	9	13	14	14	
REVENUE DATA ($M)									
CPU Revenue	16	14	14	14	17	20	24	29	15
Terminal Revenue	1	0	-	-	-	-	-	-	NA
Peripheral Revenue	0	-	0	0	0	0	0	0	2
Hardware Revenue	17	14	14	14	17	20	24	29	15
Year-to-Year Increase (%)	7	-19	5	1	18	19	19	19	
Software Revenue	11	9	9	11	13	16	19	23	19
Year-to-Year Increase (%)	17	-18	8	19	18	19	19	19	
Software Service	4	5	6	8	9	10	11	13	15
Hardware Service	4	4	3	3	4	5	5	6	11
Service Revenue	8	8	10	11	13	14	17	19	14
Year-to-Year Increase (%)	7	2	15	13	15	14	14	12	
Total Factory Revenue	36	31	34	37	43	51	60	70	16
Year-to-Year Increase (%)	10	-14	9	9	17	18	18	17	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-8
CAD/CAM/CAE/GIS Software History and Forecast
Detail Germany Forecast, PCB/MCM/Hybrid, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	3,473	3,046	2,057	2,300	2,700	3,400	4,300	5,500	22
Seats	3,548	3,102	2,192	2,400	2,900	3,600	4,500	5,700	21
Year-to-Year Increase (%)	7	-13	-29	11	17	26	26	25	
Installed Base									
CPUs	19,493	18,494	17,047	15,800	14,900	15,200	16,700	18,600	2
Seats	20,248	19,135	17,640	16,400	15,400	15,900	17,600	19,600	2
Year-to-Year Increase (%)	-1	-5	-8	-7	-6	3	10	12	
REVENUE DATA ($M)									
CPU Revenue	26	20	16	18	21	28	36	50	25
Terminal Revenue	2	2	4	3	3	4	4	4	4
Peripheral Revenue	0	0	0	0	0	1	1	2	41
Hardware Revenue	28	22	20	21	24	32	42	57	23
Year-to-Year Increase (%)	-28	-24	-7	5	15	32	29	35	
Software Revenue	20	16	13	14	16	21	27	36	22
Year-to-Year Increase (%)	-10	-21	-18	9	14	29	28	31	
Software Service	9	8	7	7	8	10	13	17	21
Hardware Service	5	4	3	3	4	5	7	9	25
Service Revenue	13	11	10	11	12	15	19	26	22
Year-to-Year Increase (%)	7	-15	-16	9	10	29	29	35	
Total Factory Revenue	62	49	43	46	52	68	88	118	22
Year-to-Year Increase (%)	-17	-21	-13	7	14	30	29	34	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-9
CAD/CAM/CAE/GIS Software History and Forecast
Detail Germany Forecast, All Applications, UNIX

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	23,699	23,113	27,880	33,200	37,100	40,200	44,100	48,500	12
Seats	23,699	23,113	27,880	33,200	37,100	40,200	44,100	48,500	12
Year-to-Year Increase (%)	-1	-2	21	19	12	8	10	10	
Installed Base									
CPUs	88,872	105,120	124,346	144,500	165,700	187,300	208,100	225,700	13
Seats	88,872	105,120	124,346	144,500	165,700	187,300	208,100	225,700	13
Year-to-Year Increase (%)	27	18	18	16	15	13	11	8	
REVENUE DATA ($M)									
CPU Revenue	537	502	574	698	773	830	904	985	11
Terminal Revenue	-	-	-	-	-	-	-	-	NA
Peripheral Revenue	72	42	37	40	38	34	32	29	-5
Hardware Revenue	608	544	611	738	811	865	936	1,015	11
Year-to-Year Increase (%)	2	-11	12	21	10	7	8	8	
Software Revenue	434	395	461	558	618	664	722	786	11
Year-to-Year Increase (%)	9	-9	17	21	11	7	9	9	
Software Service	164	155	193	237	256	262	270	275	7
Hardware Service	134	136	135	166	178	185	194	204	9
Service Revenue	298	291	328	403	433	446	464	479	8
Year-to-Year Increase (%)	27	-3	13	23	8	3	4	3	
Total Factory Revenue	1,341	1,230	1,400	1,698	1,862	1,975	2,122	2,280	10
Year-to-Year Increase (%)	9	-8	14	21	10	6	7	7	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-10
CAD/CAM/CAE/GIS Software History and Forecast
Detail Germany Forecast, All Applications, NT/Hybrid

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	-	6	667	2,100	2,800	4,100	5,700	8,600	67
Seats	-	6	667	2,100	2,800	4,100	5,700	8,600	67
Year-to-Year Increase (%)	NA	NA	10,847	209	35	48	38	51	
Installed Base									
CPUs	-	6	673	2,700	5,500	8,500	11,600	16,800	90
Seats	-	6	673	2,700	5,500	8,500	11,600	16,800	90
Year-to-Year Increase (%)	NA	NA	10,947	306	102	54	36	45	
REVENUE DATA ($M)									
CPU Revenue	-	0	8	31	41	68	99	163	82
Terminal Revenue	-	-	-	-	-	-	-	-	NA
Peripheral Revenue	-	0	1	4	5	6	8	10	53
Hardware Revenue	-	0	9	35	46	75	106	173	79
Year-to-Year Increase (%)	NA	NA	8,393	274	30	62	42	63	
Software Revenue	-	0	10	34	45	66	89	126	64
Year-to-Year Increase (%)	NA	NA	6,091	224	34	46	34	42	
Software Service	-	0	3	7	11	17	25	38	73
Hardware Service	-	0	4	7	9	15	20	31	49
Service Revenue	-	0	7	15	20	32	46	69	60
Year-to-Year Increase (%)	NA	NA	10,287	120	36	61	41	52	
Total Factory Revenue	-	0	27	84	111	173	240	368	69
Year-to-Year Increase (%)	NA	NA	7,614	216	33	55	39	53	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-11
CAD/CAM/CAE/GIS Software History and Forecast
Detail Germany Forecast, All Applications, Personal Computer

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	60,063	68,663	69,804	83,900	94,700	103,000	112,800	123,800	12
Seats	60,063	68,663	69,804	83,900	94,700	103,000	112,800	123,800	12
Year-to-Year Increase (%)	31	14	2	20	13	9	9	10	
Installed Base									
CPUs	204,313	238,798	272,705	310,100	345,000	375,900	397,800	411,900	9
Seats	204,313	238,798	272,705	310,100	345,000	375,900	397,800	411,900	9
Year-to-Year Increase (%)	20	17	14	14	11	9	6	4	
REVENUE DATA ($M)									
CPU Revenue	187	208	216	260	314	353	374	397	13
Terminal Revenue	-	-	-	-	-	-	-	-	NA
Peripheral Revenue	10	9	9	11	14	15	16	17	13
Hardware Revenue	198	217	226	271	328	368	390	414	13
Year-to-Year Increase (%)	21	10	4	20	21	12	6	6	
Software Revenue	149	173	182	210	232	248	266	286	9
Year-to-Year Increase (%)	34	16	5	15	11	7	7	7	
Software Service	12	16	15	18	20	22	23	26	11
Hardware Service	6	9	10	10	13	15	16	17	11
Service Revenue	18	25	26	28	33	36	39	43	11
Year-to-Year Increase (%)	14	35	5	9	17	11	9	9	
Total Factory Revenue	365	415	433	509	593	653	696	743	11
Year-to-Year Increase (%)	26	14	4	18	16	10	7	7	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-12
CAD/CAM/CAE/GIS Software History and Forecast
Detail Germany Forecast, All Applications, Host/Proprietary

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	951	919	732	600	400	300	200	200	-25
Seats	4,725	3,514	3,239	2,700	2,100	1,500	1,100	900	-23
Year-to-Year Increase (%)	-1	-26	-8	-17	-23	-29	-24	-22	
Installed Base									
CPUs	5,179	4,946	4,498	4,000	3,500	3,300	3,300	3,200	-6
Seats	21,690	20,484	19,078	17,200	15,500	14,700	14,500	14,500	-5
Year-to-Year Increase (%)	1	-6	-7	-10	-10	-5	-1	0	
REVENUE DATA ($M)									
CPU Revenue	140	85	78	60	45	31	23	17	-27
Terminal Revenue	57	42	45	34	27	20	16	13	-22
Peripheral Revenue	10	5	4	2	1	0	0	0	-53
Hardware Revenue	206	133	127	97	73	51	39	30	-25
Year-to-Year Increase (%)	-21	-36	-4	-24	-25	-29	-25	-23	
Software Revenue	40	34	27	21	15	9	6	4	-31
Year-to-Year Increase (%)	-25	-15	-22	-22	-29	-36	-34	-34	
Software Service	12	15	17	12	9	6	4	3	-29
Hardware Service	53	28	23	17	12	8	6	4	-30
Service Revenue	65	42	40	29	21	14	10	7	-30
Year-to-Year Increase (%)	-28	-35	-4	-29	-27	-32	-30	-30	
Total Factory Revenue	312	209	194	146	108	75	55	41	-27
Year-to-Year Increase (%)	-23	-33	-7	-25	-26	-31	-27	-26	

NA = Not applicable

Source: Dataquest (October 1995)

CCAM-EU-MS-9509

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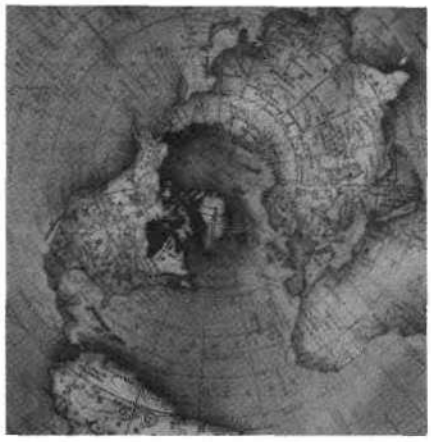
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CAD/CAM/CAE and GIS France Forecast Update



Market Statistics

Program: CAD/CAM/CAE/GIS Europe
Product Code: CCAM-EU-MS-9508
Publication Date: December 4, 1995
Filing: Market Analysis

CAD/CAM/CAE and GIS France Forecast Update



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Note: All tables show estimated data.

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CAD/CAM/CAE and GIS France Forecast Update

Fluctuating exchange rates once again masked the true market performance in the 1994 CAD/CAM/CAE and GIS market. Japanese CAD/CAM/CAE and GIS total factory revenue grew 4.8 percent from 1993 to 1994 when measured in U.S. dollars, contrary to what would be expected given the country's prolonged recession. However, the dollar depreciated against the yen at a rate of 8.2 percent so that when measured in yen, Japanese CAD/CAM/CAE and GIS total factory revenue declined 3.8 percent from 1993 to 1994.

Less dramatically, European CAD/CAM/CAE and GIS total factory revenue grew 9.9 percent from 1993 to 1994 when measured in U.S. dollars. With the dollar depreciating 1.5 percent, European CAD/CAM/CAE and GIS total factory revenue grew a lower 8.2 percent from 1993 to 1994 when measured in ECU. Table 1 shows the impact of currency fluctuation on the CAD/CAM/CAE and GIS software market.

Looking ahead, currency fluctuations will continue to be felt in all global markets. The dollar has continued to weaken during the early months of this year so that if we were to assume a stable currency for the remainder of the year, 1995 would end with the dollar depreciating 4.2 percent against the yen and 7.8 percent against the ECU (see Table 2). Although Dataquest does not forecast currency exchange rates, we do forecast with the best information available. The exchange rate is calculated as the simple arithmetic mean of the 12 average monthly rates for each country. For the purpose of this forecast, Dataquest assumes the September exchange rate will remain stable in the future.

This document contains Dataquest's detailed forecast information for the CAD/CAM/CAE and GIS industry. Included are the following:

- Five-year historical data
- Five-year forecast data

More detailed data is available through Dataquest's Client Inquiry service, which can provide custom analysis of the multidimensional database.

Changes to Our Forecast Structure

Dataquest's CAD/CAM/CAE and GIS forecast is based upon the updated market share data gathered before the end of 1994 and updated throughout 1995. In order to better serve you, the new CAD/CAM/CAE and GIS database has been restructured as follows:

- Japan is now tracked as a region separate from Asia/Pacific.
- Asia/Pacific now includes China, Hong Kong, Korea, Singapore, Taiwan, and Rest of Asia (Australia, New Zealand, India, and Southeast Asia).

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Table 1
CAD/CAM/CAE and GIS Revenue Growth Comparison (U.S. Dollars versus Local Currency for Both Europe and Japan)

Revenue by Region	1993	1994	Forecast 1999	Growth (%) 1993-1994	CAGR (%) 1994-1999
Europe ($M)					
Software Revenue	1,628.29	1,824.12	3,276.03	12.0	12.4
Hardware Revenue	2,421.88	2,604.55	5,022.05	7.5	14.0
Service Revenue	996.57	1,115.23	1,976.19	11.9	12.1
Total Factory Revenue	5,046.74	5,543.91	10,274.27	9.9	13.1
ECU/U.S.$ Exchange Rate*	0.86	0.84	0.77	-1.5	-1.8
Europe (ECU Millions)					
Software Revenue	1,394.80	1,538.83	2,522.54	10.3	10.4
Hardware Revenue	2,074.58	2,197.20	3,866.98	5.9	12.0
Service Revenue	853.67	940.81	1,521.67	10.2	10.1
Total Factory Revenue	4,323.04	4,676.84	7,911.19	8.2	11.1
Japan ($M)					
Software Revenue	1,203.33	1,315.70	2,013.89	9.3	8.9
Hardware Revenue	2,148.02	2,174.59	2,893.95	1.2	5.9
Service Revenue	756.90	813.74	1,074.17	7.5	5.7
Total Factory Revenue	4,108.24	4,304.03	5,982.01	4.8	6.8
Japan/U.S.$ Exchange Rate*	110.85	101.81	99.73	-8.2	-0.4
Japan (Yen Millions)					
Software Revenue	133,388.69	133,951.14	200,845.20	0.4	8.4
Hardware Revenue	238,107.55	221,394.71	288,613.32	-7.0	5.4
Service Revenue	83,902.25	82,847.36	107,126.86	-1.3	5.3
Total Factory Revenue	455,398.49	438,193.21	596,585.38	-3.8	6.4
North America ($M)					
Software Revenue	1,758.41	1,929.06	3,711.42	9.7	14.0
Hardware Revenue	2,345.76	2,512.99	4,526.12	7.1	12.5
Service Revenue	1,036.93	1,176.56	1,916.85	13.5	10.3
Total Factory Revenue	5,141.36	5,618.72	10,154.40	9.3	12.6
Worldwide ($M)					
Software Revenue	4,890.91	5,418.96	9,776.21	10.8	12.5
Hardware Revenue	7,351.48	7,798.97	13,510.08	6.1	11.6
Service Revenue	2,968.24	3,313.93	5,319.26	11.6	9.9
Total Factory Revenue	15,210.89	16,531.96	28,605.55	8.7	11.6

*Assuming a stable currency, the 1999 exchange rate is the September 1995 exchange rate.
Source: Dataquest (October 1995)

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Table 2
Foreign Currency versus the U.S. Dollar

		Actual					Current		Year-to-Year Change (%)					
Country	**Currency**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1990-1991**	**1991-1992**	**1992-1993**	**1993-1994**	**1994-1995**	**1995-1996**
Austria	Schilling	11.36	11.67	10.95	11.65	11.40	10.32	10.05	2.73	-6.2	6.4	-2.1	-9.5	-2.6
Belgium	Franc	33.41	34.13	32.02	34.67	33.66	30.16	29.38	2.16	-6.2	8.3	-2.9	-10.4	-2.6
Denmark	Krone	6.18	6.39	6.02	6.49	6.35	5.70	5.54	3.40	-5.8	7.8	-2.2	-10.2	-2.8
Finland	Markka	3.82	4.04	4.45	5.73	5.21	4.39	4.27	5.76	10.1	28.8	-9.1	-15.7	-2.7
France	Franc	5.44	5.64	5.27	5.67	5.54	5.04	4.92	3.68	-6.6	7.6	-2.3	-9.0	-2.4
Germany	D-Mark	1.62	1.66	1.56	1.66	1.62	1.45	1.43	2.47	-6.0	6.4	-2.4	-10.8	-1.0
Italy	Lira	1,197.22	1,238.93	1,227.75	1,577.85	1,609.34	1,625.01	1,616.00	3.48	-0.9	28.5	2.0	1.0	-0.6
Netherlands	Guilder	1.82	1.87	1.75	1.86	1.82	1.64	1.64	2.75	-6.4	6.3	-2.2	-9.9	0.2
Norway	Krone	6.25	6.49	6.18	7.11	7.04	6.42	6.25	3.84	-4.8	15.0	-1.0	-8.8	-2.6
Spain	Peseta	102.03	103.81	101.90	127.87	133.48	125.35	123.48	1.74	-1.8	25.5	4.4	-6.1	-1.5
Sweden	Krona	5.92	6.04	5.81	7.82	7.70	7.30	6.95	2.03	-3.8	34.6	-1.5	-5.2	-4.8
Switzerland	Franc	1.39	1.43	1.40	1.48	1.37	1.20	1.16	2.88	-2.1	5.7	-7.4	-12.7	-3.0
United Kingdom	Pound	0.56	0.57	0.57	0.67	0.65	0.64	0.63	1.79	0	17.5	-3.0	-1.5	-1.6
Europe Average	ECU	0.79	0.81	0.77	0.86	0.84	0.78	0.77	2.27	-4.9	11.4	-1.5	-7.8	-1.0
China	Renminbi	4.79	5.33	5.51	5.76	8.54	8.32	8.32	11.27	3.4	4.5	48.3	-2.6	0
Hong Kong	Dollar	7.79	7.77	7.74	7.74	7.73	7.74	7.73	-0.26	-0.4	0	-0.1	0.1	-0.1
Japan	Yen	144.05	134.59	126.34	110.85	101.56	97.34	99.73	-6.57	-6.1	-12.3	-8.4	-4.2	2.5
Korea	Won	242.70	730.67	782.41	799.42	805.80	773.20	768.20	201.06	7.1	2.2	0.8	-4.0	-0.6
Singapore	Dollar	1.81	1.73	1.63	1.62	1.53	1.42	1.42	-4.42	-5.8	-0.9	-5.3	-7.2	0
Taiwan	Dollar	26.64	26.49	24.93	26.15	26.45	27.50	27.06	-0.56	-5.9	4.9	1.1	4.0	-1.6

Source: Dataquest (October 1995)

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- Service is divided into hardware service and software service.
- Platforms have been replaced by operating systems, to include UNIX, host, Windows NT and PC.

This restructuring is reflected in the forecast. The net result is a better history from which to forecast. Unfortunately, because of this restructuring, the data will not match the data in Dataquest's previously published market share documents. In addition to some shifting of revenue to allow for the restructuring, several company changes were made as follows:

- Work in the new database resulted in the loss of some companies' European and Asian revenue, most notably Altera. The revenue for these companies has been corrected and is available through your inquiry privilege.
- UniCAD had inadvertently been excluded from our market share database and was therefore not included in previously published market share documents. It has been added.
- Mentor Graphics restated its revenue for 1992 and 1993, correcting an error in its reporting by shifting revenue from the year of order to the year of sale and realigning its sales to our changed subapplication definitions.

Worldwide Forecast Assumptions

The following paragraphs describe the main forces driving the CAD/CAM/CAE and GIS worldwide software forecast.

Mechanical Forecast Assumptions

The mechanical CAD/CAM/CAE market, which grew 9.7 percent in 1994, is expected to reach a market size of $3.9 million in five years. The market will be fueled by a complex and rich blend of emerging technologies, regional growth, and new applications for CAD technology.

Emerging Technologies

Topping the list of emerging technologies is product data management. This market has clearly begun to take off, not only in Europe and the United States but in Japan and Korea as well. Within the past year, we have seen pilot programs begin to move to full-scale production, support for new client platforms (Windows NT, Windows), integration with materials resource planning (MRP) systems, and an emergence of a "lite" product data management (PDM) category. PDM will be one of the significant drivers of the mechanical CAD market through 1999. Farther down the road, we expect growth in the industry to come from other emerging technologies, including generative numerical control (NC) software, analysis, conceptual design, and simulation/optimization software.

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Regional Growth

The outlook for the European markets is brighter than it has been for the last few years. The European economy as a whole continues to emerge slowly from its recession, and many of the European industries have begun a major restructuring of their information technology (IT) investment. Tool purchases by automotive companies and their supplier bases will lead to higher growth for both software and hardware revenue in the mechanical CAD/CAM/CAE sector in Europe.

Mechanical CAD/CAM/CAE growth in Japan is expected to undergo a significant shift in platform usage over our forecast period. Currently, the UNIX platform dominates the mechanical sector in Japan, despite the fact the Japanese mechanical market still places a heavy emphasis on 2-D drafting instead of 3-D/solid modeling. We expect this drafting orientation to persist, and in the next five years we anticipate a significant shift to more Windows NT and PC-based operating systems, at the expense of UNIX. This shift will not begin in earnest until late 1996, when Japan-specific versions of mechanical software on Windows NT are more widely available.

New Applications for CAD Technology

In 1994, we saw the beginning of new applications for mechanical CAD technology. Growth is picking up in nontraditional industries (those industries outside of aerospace and automotive). We expect this trend to continue as mechanical modeling, analysis, design, and simulation software become more user-friendly. Closely linked to the use of mechanical CAD in new arenas is the availability of such software on lower-cost platforms like Windows NT and the use of object technology to create customized industry- or application-specific solutions.

AEC Forecast Assumptions

The Impact of Windows NT

Intergraph dominates the UNIX market in North America, and the company's shift to Windows NT will cause both the collapse of UNIX sales in North America and the gradual erosion of UNIX in Europe. Windows NT will get a boost in 1995, driven by frustrated PC users who demand high performance and who cannot wait for Windows 95 to solve their requirements.

Factors that should contribute to the long-term expansion of the AEC CAD market are as follows:

CAD Is Becoming a Business Requirement

Large design firms are growing at the expense of smaller firms. These large end users increasingly require their employees and suppliers to adopt automation tools in the design and construction process. Smaller design firms must increasingly buy CAD systems or risk being dropped from consideration as a partner.

CAD purchases are increasingly justified as a competitive advantage in both sales and design reviews. Electronic design data is also required

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downstream by the designer's client, from the federal government down to the small commercial developer. Also, a significant pool of untapped users still exists. The current relatively low market penetration of AEC CAD systems should allow steady worldwide growth during the next five years, despite constant volatility in demand for the buildings and infrastructure to be designed.

New Features in AEC CAD Products Are Achievable

Better, lower-cost visualization tools will be in increasing demand as sales and communication tools. Data and database functions (versus graphics functions) are increasing in importance in AEC design systems, creating opportunities to sell users significant new functionality. Some vendors will create products that foster communication in the entire design, construction, and maintenance process, products that will increase the payoff in CAD investments.

The following trends will inhibit growth in the AEC CAD industry:

Design Is Only Part of the Problem

AEC's one-design-one-build structure means CAD provides fewer economic benefits to these users than does the one-design-build-many structure of manufacturing. Construction, which is essentially a prototype build, is fraught with uncertainties and delays that are not well addressed by existing AEC systems. Design tools can only thrive in the AEC structure when they support more of the entire business problem.

Poor Cooperation among Users

Users are poorly organized to take advantage of improved products, partly because of competition between engineering constructors and partly because designs are often split among several different companies representing different and competing aspects of the design process. New approaches to the design and construction process are needed to allow users to take full advantage of CAD tools.

GIS/Mapping Forecast Assumptions

The Impact of Windows NT

Intergraph's move to Windows NT at the expense of UNIX will quickly make PC-based operating systems the dominant revenue stream in North America. In the long term, the GIS UNIX market is highly subject to erosion by Windows NT because of the appeal of better integration of GIS and Windows-based productivity tools.

Factors that should contribute to the long-term expansion of the GIS market are as follows:

There Exists an Abundant Supply of Prospective Buyers

Penetration is still moderately low among core users. Bread-and-butter prospects in government and utilities are charged with maintaining information on land and assets in perpetuity. Many of these prospective buyers are still using paper maps that will degrade over time. This creates a certain inevitability to moving from paper maps to computer-based systems.

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New Technologies Will Drive Growth

Faster, cheaper computers will be continually leveraged to support new software products. Widespread computer-industry developments in open, distributed systems supporting high-speed networking will make it possible for GIS technology to broadly expand its user base. Lower-cost, higher-resolution satellite imagery holds the potential to drive another explosion in GIS market growth among users who cannot afford aerial photography. Advances in aerial photography, global positioning systems (GPSs), and laser range finders are making it possible to create GISs significantly cheaper, more accurate, and more complete than existing paper maps, giving experienced users some compelling reasons to reinvest. Portable and pen-based computers are bringing GIS to new users in field operations.

Data Will Drive Growth

The GIS business market is driving high growth on PCs. However, we see a wide band of uncertainty surrounding the clearly growing revenue opportunity from new applications. Several new applications in GIS are destined to become relatively low-revenue producing features in other software programs (and market), rather than standalone products in the GIS market. At the same time, data is increasing in value relative to software in this low-end market.

GIS has attained a certain indispensability, particularly among federal users and in utilities. As a result, users are beginning to expect to share the data in their various GIS systems. Within three years, we expect data to be readily exchangeable across different systems. At that point, shareable data will help drive market growth.

Several factors seriously constrain the long-term expansion of the GIS market, as follows:

High Cost of Entry Remains a Barrier

There will remain an uncertain, but certainly high, cost of creating a working GIS system in traditional environments. No magic will emerge to create a low-cost, meaningful data set for mainstream customers in government and utilities. Data conversion will remain costly because the significant cost of correcting prior errors and omissions on paper maps is inevitably bundled into the cost of "conversion."

Price Pressures Inhibit Growth

Price pressure will hold down total revenue. Innovation is the only way to maintain prices in any software industry, and GIS vendors will struggle in their attempt to create compelling new applications and improved investment payoff for customers.

Electronic Design Automation

The EDA software market grew 16.8 percent in 1994. Over the next five years, growth will continue to be fueled by continually increasing design complexity and ever-higher speeds.

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Electronic CAE

The demands today's tools place on CPU processing speed and memory size are reversing the process of equalization and driving the sales of UNIX-class tools. Equalization (PC-based tools becoming more expensive as UNIX-based tools fall in price) was either caused by the stagnation of the design challenge or, more likely, the stagnation in tool development. Design complexity is forcing a large-scale swap: gate-level users are swapping up to registered transfer (RT)-level while RT-level users are swapping up to electronic system (ES)-level tools. RT-level tools will begin to appear on Windows NT, competing with the UNIX-based tools while the ES-level tools will remain UNIX-based. Meanwhile, low-end design—still manageable by PC-based tools—is shifting to Asia/Pacific and driving PC growth in that region. The main inhibitor to growth in CAE tools is the engineering learning curve.

IC Layout

The IC-layout market grew as expected, 20 percent from 1993 to 1994, after several very sleepy years. Design complexity and high speed is forcing replacement of obsolete tools, driving this high growth. This is primarily a replacement market of very high-cost tools and very few players. The ensuing frenzy for market share is the result. The few PC-based tools in this market are being replaced by UNIX-class tools in North America and Japan. Growth in the very few PC-based tools is in Europe (including eastern Europe) and Asia/Pacific. It is yet unclear whether Windows NT will be able to penetrate the IC Layout market.

PCB/MCM/Hybrid

The 3.3 percent growth in the printed circuit board (PCB) market comes as a surprise, given the forecast negative 2 percent growth from 1993 to 1994. The strong yen masked a decline in PCB growth (in yen) in Japan, where half of PCB sales are.

Organizational manufacturing models are driving changes in the PCB market. As manufacturing organizations are moving to Asia/Pacific (from both North America and Japan), the low-speed designing is following, driving PC sales in that region. In North America, Europe, and Japan, high-speed board design is moving from manufacturing into engineering departments that are traditionally UNIX-based. Where new engineering environments are being created for RT-level designs, the opportunity for Windows NT to take over both the CAE environment and the PCB environment exists.

Forecast Methodology

Fundamental to the way Dataquest conducts its research is the underlying philosophy that the best data and analyses come from a well-balanced program. This program includes the following: balance between primary and secondary collection techniques; balance between supply-side and demand-side analysis; balance between focused, industry-specific research and coordinated, "big-picture" analysis aided by integration of data from the more than 25 separate high-technology industries Dataquest covers; and balance between the perspectives of

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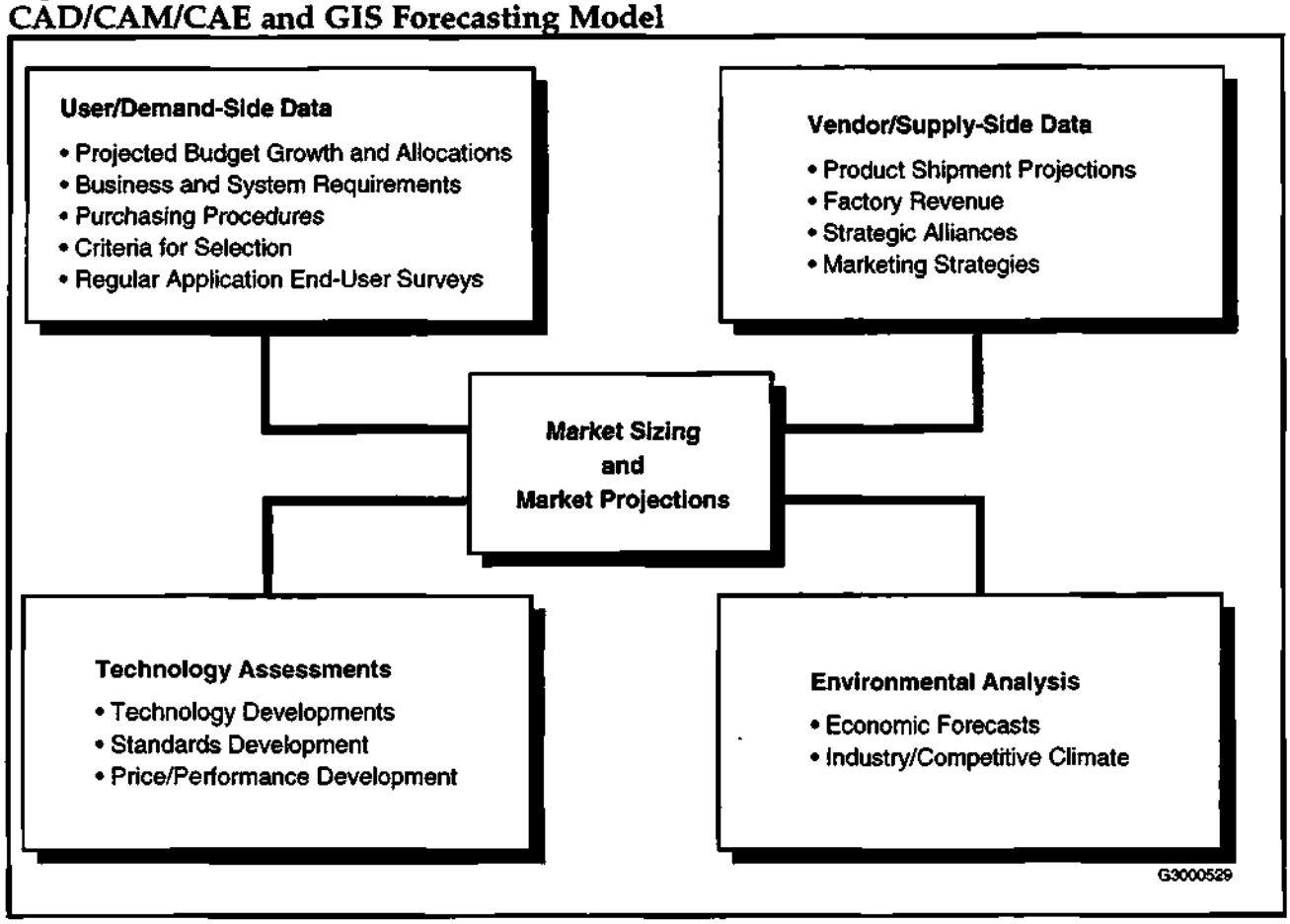
experienced industry professionals and rigorous, disciplined techniques of seasoned market researchers.

Dataquest also analyzes trends in the macro environment, which can have major influences on both supply-side and demand-side forecasting. In addition to demographics, analysts look at gross national product (GNP) growth, interest rate fluctuation, business expectations, and capital spending plans. In the geopolitical arena, the group looks at trade issues, political stability or lack thereof, tariffs, nontariff barriers, and such factors as the effect on Europe of the events of 1994.

Figure 1 shows the CAD/CAM/CAE and GIS forecasting model. The overall forecasting process uses a combination of techniques such as time series and technological modeling. Market estimates and forecasts are derived using the following research techniques:

- Segment forecasting—Individual forecasts are derived for each application segment tracked by the CAD/CAM/CAE and GIS group. Specifically, each application, segmented by region and platform, is forecast and rolled up. In this way, each application segment incorporates its own set of unique assumptions.

Figure 1
CAD/CAM/CAE and GIS Forecasting Model



Source: Dataquest (May 1995)

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- Demand-based analysis—Market growth is tracked and forecast in terms of the present and anticipated demand of current and future users. This requires the development of a total available market model and a satisfied available market figure to assess the levels of penetration accurately. Dataquest analysts also factor in the acceptance or ability for users to consume new technology.
- Capacity-based analysis—This method involves identifying future shipment volume constraints. These constraints, or "ceilings," can be the result of component availability, manufacturing capacity, or distribution capacity. In any case, capacity limitations are capable of keeping shipments below the demand level.

Segmentation Definitions

This section lists the definitions specific to this document. The following paragraphs define the segments.

Applications

- Mechanical—The mechanical segment refers to computer-aided tools used by engineers, designers, analysts, technicians, and draftspeople working predominantly in the discrete manufacturing industries, but includes government and education. Users of mechanical CAD/CAM/CAE tools work in all departments across the typical organization, with a majority found in product design, advanced engineering, and manufacturing engineering. Common design applications include conceptual design, industrial design, structural or thermal analysis, detail design, and electromechanical design (the mechanical part of design with electrical or electronic components and mechanisms). Common manufacturing applications include tool and fixture design, numerical control part programming, offline robotics programming, and interface to quality-control systems. Management tools for database control and distribution are included in this segment, as well as user-defined application programming.
- Architecture, Engineering, and Construction (AEC)—The AEC segment covers the use of computer-aided tools by architects, contractors, plant engineers, civil engineers, and other people associated with these disciplines to aid in designing and managing buildings, industrial plants, ships, and other types of nondiscrete entities.
- Geographic Information Systems (GIS)/Mapping—GIS is computer-based technology, and the segment is composed of hardware, software, and data used to capture, edit, display, and analyze spatial (tagged by location) information.
- Electronic Design Automation (EDA)—The EDA segment covers computer-based tools used to automate the process of designing an electronic product, including printed circuit boards, ICs, and systems. EDA includes ECAE, IC layout, and PCB/hybrid/MCM, as follows:
  - Electronic computer-aided engineering (ECAE)—These are computer-aided tools used in the engineering or design phase of electronic products (as opposed to the physical layout phase of the

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product). Examples of ECAE applications are schematic capture and simulation.

- IC layout—This is a software application tool used to create and validate the physical implementation of an IC. The IC layout category comprises polygon editors, symbolic editors, placement and routing (gate array, cell, and block), design verification tools (DRC/ERC/logic-to-layout), compilers, and module development tools.
- PCB/hybrid/MCM—This segment covers products used to create the placement and routing of the traces and components laid out on a printed circuit board. Also included in this category are thermal analysis tools.

Regions

The following bullets define the regions.

- North America—North America includes United States, Mexico, and Canada.
- Europe—Europe includes the United Kingdom, Scandinavia, Benelux, France, Germany, Italy, Spain, Austria/Switzerland, Russia, central Europe, and the rest of Europe.
- Japan
- Asia—Asia includes Singapore, Taiwan, Korea, China, Hong Kong, and the rest of Asia (Australia, India, and Southeast Asia).
- Rest of World—Rest of World includes all other countries and regions, including Africa, the Middle East, Central America, and South America.

Operating Systems

The following paragraphs define the operating systems.

UNIX. UNIX includes all UNIX variants and older workstation operating systems.

Host. Host includes minicomputer and mainframe operating systems in which external workstations' functions are dependent on a host computer.

Windows NT. Windows NT is the Microsoft operating system.

PC. PC includes DOS, Windows, Windows 95, OS/2, and Apple operating systems.

Line Items

Line item definitions are as follows:

- Average selling price (ASP) is defined as the average price of a product, inclusive of any discounts.
- CPU revenue is the portion of revenue derived from a system sale that is related to the value of the CPU.

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- CPU shipment is defined as the number of CPUs delivered.
- CPU installed base is defined as the total number of CPUs in active, day-to-day use.
- Unit shipment is defined as the number of products delivered (that is, seats).
- Seats are defined as the number of possible simultaneous users.
- Installed seats are defined as the total number of seats in active, day-to-day use.
- Hardware revenue is defined as the sum of the revenue from the hardware system components: CPU revenue, terminal revenue, and peripherals revenue.
- Peripherals revenue is defined as the value of all the peripherals from turnkey sale. (Peripherals in this category typically are input and output devices.)
- Terminal revenue is defined as revenue derived from the sale of terminals used to graphically create, analyze, or manipulate designs. The term is applicable only to the host systems.
- Software revenue is revenue derived from the sale of application software.
- Service revenue is defined as revenue derived from the service and support of CAD/CAM/CAE or GIS systems. Service is followed as software service and hardware service.
- Total factory revenue is defined as the amount of money received for goods measured in U.S. dollars and is the sum of hardware, software, and service revenue.

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Table A-1
CAD/CAM/CAE/GIS Software History and Forecast
Top Level Worldwide Forecast, All Applications, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
Software Revenue ($M)									
Worldwide, All Operating Systems	4,583	4,891	5,419	6,224	6,942	7,763	8,691	9,776	12.5
Worldwide									
UNIX	3,163	3,401	3,796	4,249	4,630	5,007	5,439	5,913	9.3
Windows NT	-	5	106	356	568	872	1,201	1,621	72.4
Personal Computer	1,066	1,190	1,327	1,484	1,652	1,827	2,012	2,214	10.8
Host/Proprietary	354	295	190	136	92	58	39	27	-32.1
All Operating Systems									
North America	1,599	1,759	1,929	2,170	2,480	2,863	3,279	3,711	14.0
Europe	1,668	1,628	1,824	2,178	2,410	2,650	2,926	3,276	12.4
Japan	1,117	1,203	1,316	1,445	1,563	1,694	1,840	2,014	8.9
Asia/Pacific	137	207	255	320	364	415	484	587	18.2
Rest of World	61	94	95	112	125	141	161	187	14.5
Year-to-Year Software Revenue Growth Rate (%)									
Worldwide, All Operating Systems		6.7	10.8	14.9	11.5	11.8	11.9	12.5	
Worldwide									
UNIX		7.5	11.6	11.9	9.0	8.1	8.6	8.7	
Windows NT		NA	1,950.4	234.2	59.8	53.4	37.8	35.0	
Personal Computer		11.6	11.5	11.8	11.3	10.6	10.1	10.1	
Host/Proprietary		-16.7	-35.6	-28.3	-32.5	-36.6	-32.2	-30.4	
All Operating Systems									
North America		10.0	9.7	12.5	14.3	15.5	14.5	13.2	
Europe		-2.4	12.0	19.4	10.7	10.0	10.4	12.0	
Japan		7.7	9.3	9.8	8.2	8.4	8.6	9.4	
Asia/Pacific		51.3	22.9	25.4	13.8	14.1	16.5	21.5	
Rest of World		53.2	1.7	17.7	11.5	12.6	14.6	16.3	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-1
CAD/CAM/CAE/GIS Software History and Forecast
Detail France Forecast, All Applications, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	28,534	30,344	34,492	40,800	45,800	50,600	55,700	62,100	12
Seats	30,171	31,080	35,403	41,600	46,400	51,100	56,000	62,300	12
Year-to-Year Increase (%)	15	3	14	17	12	10	10	11	
Installed Base									
CPUs	99,271	117,009	136,746	157,400	178,000	197,900	214,700	228,800	11
Seats	107,398	123,903	142,766	162,600	182,500	202,100	218,700	232,800	10
Year-to-Year Increase (%)	21	15	15	14	12	11	8	6	
REVENUE DATA ($M)									
CPU Revenue	339	318	361	430	481	533	585	659	13
Terminal Revenue	26	15	17	13	10	8	6	4	-24
Peripheral Revenue	29	21	19	22	21	21	21	21	2
Hardware Revenue	395	354	397	465	512	562	611	684	11
Year-to-Year Increase (%)	-1	-10	12	17	10	10	9	12	
Software Revenue	238	239	278	338	378	418	462	519	13
Year-to-Year Increase (%)	12	0	16	21	12	11	10	12	
Software Service	74	77	103	126	138	147	156	166	10
Hardware Service	79	75	77	89	95	101	108	118	9
Service Revenue	153	151	180	214	233	248	264	284	10
Year-to-Year Increase (%)	5	-1	19	19	9	7	6	8	
Total Factory Revenue	785	744	855	1,017	1,124	1,229	1,337	1,487	12
Year-to-Year Increase (%)	4	-5	15	19	11	9	9	11	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-2
CAD/CAM/CAE/GIS Software History and Forecast
Detail France Forecast, Mechanical, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	12,767	13,653	15,670	18,800	20,800	22,700	24,400	26,200	11
Seats	14,167	14,284	16,479	19,500	21,400	23,100	24,600	26,400	10
Year-to-Year Increase (%)	10	1	15	18	10	8	7	7	
Installed Base									
CPUs	44,821	52,892	62,067	72,100	81,900	91,600	99,700	105,300	11
Seats	51,144	58,339	66,970	76,500	85,800	95,300	103,300	108,900	10
Year-to-Year Increase (%)	20	14	15	14	12	11	8	5	
REVENUE DATA ($M)									
CPU Revenue	202	182	211	252	275	294	311	332	10
Terminal Revenue	20	12	15	12	9	7	5	3	-26
Peripheral Revenue	22	13	13	14	13	12	11	11	-4
Hardware Revenue	243	207	239	278	297	313	327	347	8
Year-to-Year Increase (%)	0	-15	15	16	7	5	5	6	
Software Revenue	134	135	160	196	216	235	252	272	11
Year-to-Year Increase (%)	13	0	19	22	10	9	7	8	
Software Service	42	44	63	78	84	87	89	91	7
Hardware Service	52	46	46	55	57	58	59	61	6
Service Revenue	94	90	109	133	141	145	149	152	7
Year-to-Year Increase (%)	1	-5	22	21	6	3	2	2	
Total Factory Revenue	472	432	508	607	654	693	728	770	9
Year-to-Year Increase (%)	4	-8	18	19	8	6	5	6	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-3
CAD/CAM/CAE/GIS Software History and Forecast
Detail France Forecast, AEC, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	7,908	7,865	7,788	8,800	9,400	9,900	10,500	11,200	7
Seats	8,015	7,931	7,829	8,800	9,400	9,900	10,500	11,200	7
Year-to-Year Increase (%)	12	-1	-1	13	7	5	5	7	
Installed Base									
CPUs	25,787	30,486	34,179	37,100	39,100	40,300	40,900	40,600	4
Seats	26,602	31,161	34,694	37,400	39,400	40,500	41,100	40,800	3
Year-to-Year Increase (%)	28	17	11	8	5	3	1	-1	
REVENUE DATA ($M)									
CPU Revenue	42	38	39	46	50	55	57	61	9
Terminal Revenue	2	1	0	0	0	0	0	0	-38
Peripheral Revenue	4	3	2	2	2	2	2	2	3
Hardware Revenue	47	42	42	48	53	57	59	64	9
Year-to-Year Increase (%)	0	-12	0	17	9	8	5	7	
Software Revenue	32	30	31	36	38	40	42	45	7
Year-to-Year Increase (%)	15	-9	5	15	6	5	5	6	
Software Service	7	6	6	7	8	8	8	8	6
Hardware Service	6	6	6	7	7	7	8	8	6
Service Revenue	13	12	12	14	14	15	16	16	6
Year-to-Year Increase (%)	11	-9	5	13	3	3	4	5	
Total Factory Revenue	93	83	85	99	105	112	117	125	8
Year-to-Year Increase (%)	6	-11	3	16	7	6	5	6	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-4
CAD/CAM/CAE/GIS Software History and Forecast
Detail France Forecast, GIS/Mapping, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	2,122	2,757	3,461	4,600	5,400	6,300	7,200	8,200	19
Seats	2,214	2,805	3,492	4,600	5,400	6,300	7,200	8,200	18
Year-to-Year Increase (%)	47	27	24	31	19	15	15	13	
Installed Base									
CPUs	5,773	7,926	10,626	14,000	17,700	21,100	23,800	26,400	20
Seats	6,271	8,378	10,999	14,200	17,800	21,200	23,900	26,500	19
Year-to-Year Increase (%)	39	34	31	29	25	19	12	11	
REVENUE DATA ($M)									
CPU Revenue	28	35	39	51	58	68	76	86	18
Terminal Revenue	2	1	1	0	0	0	0	0	-70
Peripheral Revenue	4	5	4	5	6	6	6	6	10
Hardware Revenue	33	41	43	56	64	74	82	93	17
Year-to-Year Increase (%)	13	23	5	31	13	15	12	13	
Software Revenue	21	27	29	41	47	53	59	64	17
Year-to-Year Increase (%)	49	30	8	39	15	12	11	10	
Software Service	6	9	10	14	15	16	18	19	13
Hardware Service	6	9	10	12	13	15	16	18	12
Service Revenue	12	18	21	25	28	31	34	37	12
Year-to-Year Increase (%)	41	46	16	24	10	10	9	9	
Total Factory Revenue	66	86	93	123	139	157	175	194	16
Year-to-Year Increase (%)	27	30	8	32	13	13	11	11	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-5
CAD/CAM/CAE/GIS Software History and Forecast
Detail France Forecast, Electronic Design Automation, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	5,738	6,069	7,574	8,600	10,200	11,700	13,700	16,600	17
Seats	5,776	6,060	7,603	8,700	10,200	11,800	13,700	16,600	17
Year-to-Year Increase (%)	19	5	25	14	18	15	17	21	
Installed Base									
CPUs	22,891	25,704	29,874	34,200	39,300	44,900	50,200	56,400	14
Seats	23,382	26,025	30,103	34,400	39,400	45,000	50,400	56,600	13
Year-to-Year Increase (%)	14	11	16	14	15	14	12	12	
REVENUE DATA ($M)									
CPU Revenue	68	63	72	81	98	117	140	178	20
Terminal Revenue	2	1	1	1	1	1	1	1	-4
Peripheral Revenue	0	0	0	0	0	1	1	2	50
Hardware Revenue	70	64	74	82	99	119	142	181	20
Year-to-Year Increase (%)	-10	-9	14	11	21	20	20	27	
Software Revenue	50	47	57	65	77	91	109	138	19
Year-to-Year Increase (%)	-1	-7	22	13	19	18	20	26	
Software Service	19	18	23	27	31	36	41	48	16
Hardware Service	15	14	14	15	18	21	25	31	17
Service Revenue	34	32	37	42	49	57	66	79	16
Year-to-Year Increase (%)	4	-5	16	14	17	15	16	20	
Total Factory Revenue	154	143	168	189	226	267	317	398	19
Year-to-Year Increase (%)	-4	-7	17	12	20	18	19	25	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-6
CAD/CAM/CAE/GIS Software History and Forecast
Detail France Forecast, Electronic CAE, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	3,771	4,274	5,777	6,500	7,600	8,700	10,000	12,000	16
Seats	3,775	4,263	5,816	6,500	7,700	8,700	10,100	12,100	16
Year-to-Year Increase (%)	15	13	36	13	17	14	15	20	
Installed Base									
CPUs	14,101	16,577	20,337	24,200	28,500	32,800	36,600	41,000	15
Seats	14,234	16,648	20,411	24,300	28,600	32,900	36,700	41,200	15
Year-to-Year Increase (%)	19	17	23	19	18	15	12	12	
REVENUE DATA ($M)									
CPU Revenue	43	44	51	57	70	84	100	127	20
Terminal Revenue	1	1	1	1	1	1	1	1	-8
Peripheral Revenue	0	0	0	0	0	0	0	1	57
Hardware Revenue	44	44	52	58	71	84	101	129	20
Year-to-Year Increase (%)	-3	0	17	11	22	19	19	28	
Software Revenue	32	33	41	46	55	65	78	100	20
Year-to-Year Increase (%)	5	2	26	11	21	18	20	28	
Software Service	11	11	15	17	20	23	26	31	16
Hardware Service	9	10	10	11	13	15	17	21	17
Service Revenue	21	21	24	28	33	38	43	52	16
Year-to-Year Increase (%)	13	1	16	13	19	15	15	19	
Total Factory Revenue	97	98	118	131	159	187	222	280	19
Year-to-Year Increase (%)	3	1	20	12	21	18	19	26	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-7
CAD/CAM/CAE/GIS Software History and Forecast
Detail France Forecast, IC Layout, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	291	277	352	400	500	500	600	800	17
Seats	294	266	337	400	500	500	600	800	18
Year-to-Year Increase (%)	-22	-9	27	15	19	19	18	18	
Installed Base									
CPUs	1,440	1,547	1,727	1,900	2,100	2,500	2,800	3,200	13
Seats	1,440	1,530	1,694	1,900	2,100	2,400	2,800	3,200	13
Year-to-Year Increase (%)	8	6	11	12	12	15	15	14	
REVENUE DATA ($M)									
CPU Revenue	11	10	12	12	14	17	20	23	15
Terminal Revenue	0	0	-	-	-	-	-	-	NA
Peripheral Revenue	-	-	0	0	0	0	0	0	0
Hardware Revenue	11	10	12	12	15	17	20	23	15
Year-to-Year Increase (%)	-20	-14	19	5	18	18	17	17	
Software Revenue	8	7	8	10	11	13	16	18	17
Year-to-Year Increase (%)	-17	-14	24	17	18	18	17	17	
Software Service	3	3	5	6	7	7	8	9	13
Hardware Service	3	3	3	3	3	4	4	5	12
Service Revenue	6	6	8	9	10	11	12	14	13
Year-to-Year Increase (%)	-19	5	27	13	15	13	12	10	
Total Factory Revenue	25	22	27	30	36	42	48	56	15
Year-to-Year Increase (%)	-19	-9	22	11	17	17	16	15	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-8
CAD/CAM/CAE/GIS Software History and Forecast
Detail France Forecast, PCB/MCM/Hybrid, All Operating Systems

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	1,677	1,518	1,444	1,700	2,100	2,500	3,000	3,800	21
Seats	1,707	1,531	1,449	1,700	2,100	2,500	3,000	3,800	21
Year-to-Year Increase (%)	41	-10	-5	19	19	21	21	25	
Installed Base									
CPUs	7,350	7,580	7,810	8,100	8,700	9,700	10,800	12,200	9
Seats	7,708	7,847	7,998	8,300	8,800	9,700	10,900	12,300	9
Year-to-Year Increase (%)	6	2	2	3	6	11	12	13	
REVENUE DATA ($M)									
CPU Revenue	13	10	9	11	13	16	21	28	24
Terminal Revenue	1	1	0	0	0	0	0	0	5
Peripheral Revenue	0	0	0	0	0	0	1	1	45
Hardware Revenue	15	10	10	11	13	17	21	29	24
Year-to-Year Increase (%)	-19	-31	-3	16	19	28	25	35	
Software Revenue	10	8	8	9	11	13	16	20	20
Year-to-Year Increase (%)	-2	-26	5	16	15	21	21	28	
Software Service	5	3	4	4	5	6	7	9	19
Hardware Service	3	2	2	2	2	3	3	5	23
Service Revenue	7	5	5	6	7	8	10	13	20
Year-to-Year Increase (%)	5	-30	4	16	11	21	22	32	
Total Factory Revenue	32	23	23	27	31	38	47	62	22
Year-to-Year Increase (%)	-9	-29	1	16	16	24	23	32	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-9
CAD/CAM/CAE/GIS Software History and Forecast
Detail France Forecast, All Applications, UNIX

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	9,067	9,981	11,944	14,100	16,000	17,600	19,400	21,400	12
Seats	9,067	9,981	11,944	14,100	16,000	17,600	19,400	21,400	12
Year-to-Year Increase (%)	3	10	20	18	13	11	10	10	
Installed Base									
CPUs	33,859	41,199	49,841	59,000	68,600	78,800	88,700	97,000	14
Seats	33,859	41,199	49,841	59,000	68,600	78,800	88,700	97,000	14
Year-to-Year Increase (%)	27	22	21	18	16	15	13	9	
REVENUE DATA ($M)									
CPU Revenue	211	222	252	303	341	374	409	448	12
Terminal Revenue	-	-	-	-	-	-	-	-	NA
Peripheral Revenue	24	17	15	15	14	13	12	11	-6
Hardware Revenue	235	239	267	319	355	387	421	459	11
Year-to-Year Increase (%)	7	2	12	20	12	9	9	9	
Software Revenue	172	175	204	245	275	302	330	361	12
Year-to-Year Increase (%)	14	2	16	20	12	10	9	9	
Software Service	66	69	92	112	123	129	134	137	8
Hardware Service	53	60	59	72	78	83	88	93	9
Service Revenue	119	129	151	184	201	212	222	230	9
Year-to-Year Increase (%)	20	8	17	22	9	5	5	4	
Total Factory Revenue	526	543	621	748	832	901	973	1,049	11
Year-to-Year Increase (%)	12	3	14	20	11	8	8	8	

NA = Not applicable
Source: Dataquest (October 1995)

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Table B-10
CAD/CAM/CAE/GIS Software History and Forecast
Detail France Forecast, All Applications, NT/Hybrid

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	-	12	325	1,200	1,600	2,300	3,000	4,400	68
Seats	-	12	325	1,200	1,600	2,300	3,000	4,400	68
Year-to-Year Increase (%)	NA	NA	2,598	274	33	39	33	46	
Installed Base									
CPUs	-	12	337	1,600	3,200	4,800	6,200	8,800	92
Seats	-	12	337	1,600	3,200	4,800	6,200	8,800	92
Year-to-Year Increase (%)	NA	NA	2,698	361	104	50	31	40	
REVENUE DATA ($M)									
CPU Revenue	-	0	4	20	26	40	55	87	83
Terminal Revenue	-	-	-	-	-	-	-	-	NA
Peripheral Revenue	-	0	1	3	3	4	5	6	54
Hardware Revenue	-	0	5	23	29	44	59	92	80
Year-to-Year Increase (%)	NA	NA	2,125	367	28	50	36	55	
Software Revenue	-	0	5	20	27	38	50	72	68
Year-to-Year Increase (%)	NA	NA	1,521	270	34	41	32	44	
Software Service	-	0	2	5	8	12	16	23	72
Hardware Service	-	0	2	5	6	9	12	18	50
Service Revenue	-	0	4	11	14	21	28	40	60
Year-to-Year Increase (%)	NA	NA	2,892	177	34	48	34	45	
Total Factory Revenue	-	1	14	53	70	103	137	205	71
Year-to-Year Increase (%)	NA	NA	1,971	279	31	46	34	49	

NA = Not applicable

Source: Dataquest (October 1995)

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Table B-11
CAD/CAM/CAE/GIS Software History and Forecast
Detail France Forecast, All Applications, Personal Computer

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	19,057	20,012	21,901	25,200	28,000	30,600	33,200	36,200	11
Seats	19,057	20,012	21,901	25,200	28,000	30,600	33,200	36,200	11
Year-to-Year Increase (%)	25	5	9	15	11	9	8	9	
Installed Base									
CPUs	63,136	73,714	84,679	95,200	104,700	112,900	118,300	121,600	8
Seats	63,136	73,714	84,679	95,200	104,700	112,900	118,300	121,600	8
Year-to-Year Increase (%)	24	17	15	12	10	8	5	3	
REVENUE DATA ($M)									
CPU Revenue	58	58	67	77	92	104	109	116	12
Terminal Revenue	-	-	-	-	-	-	-	-	NA
Peripheral Revenue	2	2	2	3	3	4	4	4	13
Hardware Revenue	60	60	69	80	95	108	113	120	12
Year-to-Year Increase (%)	15	1	15	15	20	13	5	6	
Software Revenue	47	51	57	64	69	74	79	84	8
Year-to-Year Increase (%)	28	7	13	11	9	7	6	7	
Software Service	3	3	3	3	4	4	4	5	12
Hardware Service	2	3	3	3	4	5	5	6	12
Service Revenue	5	6	6	6	8	9	10	11	12
Year-to-Year Increase (%)	12	25	4	4	20	15	10	10	
Total Factory Revenue	112	117	133	150	172	191	202	215	10
Year-to-Year Increase (%)	20	5	13	13	15	11	6	6	

NA = Not applicable
Source: Dataquest (October 1995)

Table B-12
CAD/CAM/CAE/GIS Software History and Forecast
Detail France Forecast, All Applications, Host/Proprietary

	1992	1993	1994	1995	1996	1997	1998	1999	CAGR (%) 1994-1999
HARDWARE SHIPMENT DATA									
Shipments									
CPUs	411	339	321	300	200	100	100	100	-23
Seats	2,048	1,075	1,232	1,100	800	600	400	300	-23
Year-to-Year Increase (%)	-11	-48	15	-13	-22	-28	-26	-25	
Installed Base									
CPUs	2,277	2,083	1,889	1,700	1,500	1,400	1,400	1,400	-5
Seats	10,403	8,978	7,909	6,800	6,000	5,600	5,500	5,400	-7
Year-to-Year Increase (%)	-5	-14	-12	-14	-12	-7	-2	0	
REVENUE DATA ($M)									
CPU Revenue	71	38	38	29	22	15	11	8	-26
Terminal Revenue	26	15	17	13	10	8	6	4	-24
Peripheral Revenue	3	1	2	1	0	0	0	0	-52
Hardware Revenue	100	55	57	43	33	23	17	13	-26
Year-to-Year Increase (%)	-21	-45	3	-23	-25	-29	-26	-25	
Software Revenue	19	12	11	9	7	4	3	2	-30
Year-to-Year Increase (%)	-21	-36	-6	-19	-27	-34	-33	-34	
Software Service	4	4	7	5	4	3	2	2	-26
Hardware Service	25	12	12	8	6	4	3	2	-30
Service Revenue	29	16	19	14	10	7	5	3	-29
Year-to-Year Increase (%)	-32	-44	15	-28	-26	-31	-29	-29	
Total Factory Revenue	148	83	87	66	49	34	25	18	-27
Year-to-Year Increase (%)	-23	-44	4	-24	-25	-30	-28	-27	

NA = Not applicable

Source: Dataquest (October 1995)

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European CAD/CAM/CAE/GIS



Market Trends

Program: CAD/CAM/CAE/GIS Europe
Product Code: CCAM-EU-MT-9501
Publication Date: December 4, 1995
Filing: Market Analysis



European CAD/CAM/CAE/GIS



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Chapter 1
Report Overview

The European CAD/CAM/CAE/GIS 1995 Market Trends book presents the results of Dataquest's research and analysis in the 1994 European CAD/CAM/CAE/GIS market. The remainder of this report is divided into the following chapters:

- Chapter 2, "Executive Summary": An overview of the major findings of the report
- Chapter 3, "Trends Analysis": Definitions, discussions, and analyses of the major trends and issues driving the market
- Chapter 4, "Market Analysis": An analysis of Dataquest's 1994 European market survey results, by region and application
- Appendix A, "European CAD/CAM/CAE/GIS Market Statistics": Tables from *Source: Dataquest* market share used in reference in the text of the document
- Appendix B, "Methodology": Market definitions

Methodology

The market and trends analysis is based upon many years of industry experience in the CAD/CAM/CAE/GIS group. We use the results of primary research to define, measure, and estimate the significant parameters of the market. Vendor- and user-based surveys are conducted to gain further insight into significant market dynamics. First-hand discussions with end users, investors, and vendors are used to verify assumptions and to check analysis results.

Project Analyst: Petra Gartzen

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Chapter 2
Executive Summary

A big comeback story occurred in the European CAD/CAM/CAE/GIS market, with the region posting double-digit growth in 1994 after a few years of downturn. The market grew 12.1 percent to $1.8 billion during 1994 and it is poised for even higher growth in the near future. This is partly due to better economic output, but also due to the fact the European CAD/CAM/CAE-user community began a major restructuring of its CAD tool investment in 1994 that is set to continue into the near future. The European CAD/CAM/CAE/GIS market, which represented the world's largest regional market for this segment in terms of total revenue and software revenue until the beginning of 1993, suffered a setback in 1993 and lost its leading position. During 1994 some of this loss in market share was recovered. The region accounted for 34 percent of total CAD/CAM/CAE/GIS product sales in 1994 and 33 percent of software revenue. More details can be found in Chapters 3 and 4.

Major Trends and Issues

Major trends and issues include the following:

- The broadening and strengthening of recovery in the European economies marked the end of the long and unusually severe downturn of recent years. All major European economies began a return to positive gross domestic product (GDP) growth in 1994.
- Car production and sales figures in Europe are on the rise, and the outlook for the European industrial-machinery sector has improved sharply.
- The major European end-user industries are undergoing significant changes that will affect CAD/CAM/CAE/GIS sales in the various industries in one way or another.
- The coveted aerospace and automotive accounts continue to change hands at the expense of established players.
- Dataquest believes central and eastern Europe are major growth areas for CAD/CAM/CAE/GIS tools. Privatization and the formation of new companies are key drivers in these regions.
- The dollar depreciated slightly against European currencies in 1994; this had a positive impact on dollar revenue growth in the European countries.

The Market

The following bullet points characterize the European CAD/CAM/CAE/GIS market in 1994:

- Overall, the European CAD/CAM/CAE/GIS market grew 9.1 percent to $5.6 billion in total factory revenue in 1994. Calculated in European Currency Units (ECU), the market grew 7.4 percent.

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- CAD/CAM/CAE/GIS software revenue increased 12.1 percent to $1.8 billion. Based on ECU, software revenue grew 10.4 percent.
- U.S.-based vendors shipped 63.2 percent of the CAD/CAM/CAE/GIS software revenue, compared with 36.2 percent generated by European vendors; however, several leading products sold by U.S. vendors are being developed in Europe.
- The top 10 European CAD/CAM/CAE/GIS software market share rankings remained fairly stable through 1994. The group accounted for 49 percent of the total in 1993 and 50 percent in 1994; this translates to a $911.3 million gain in revenue.
- UNIX-based software still dominates the market, accounting for 68 percent of CAD/CAM/CAE/GIS software sales in 1994.
- The proportion of service revenue continues to increase.
- The largest regional market in 1994 was Germany, with $685 million in software revenue, representing nearly 38 percent of the total European CAD/CAM/CAE/GIS software market.
- The largest application sector in Europe is the mechanical segment, having some 48 percent of the total European CAD/CAM/CAE/GIS software market.
- The fastest-growing segment in 1994 was AEC, with 15 percent software revenue growth.

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Chapter 3
Trends Analysis

European Economy

The big comeback in 1994 occurred in Europe. After several years of gloom in the European economies, we are finally seeing light at the end of the tunnel. All major European economies began a return to positive gross domestic product (GDP) growth in 1994, and GDP is expected to remain stable for the foreseeable future. This growth will in turn likely lead to increased industrial production. Such improved economic indicators are instilling more confidence in industry sectors, and businesses are expected to substantially increase their investment in manufacturing for the remainder of 1995 and throughout 1996. In particular, car production and sales figures in Europe are on the rise and the outlook for the European industrial machinery sector has improved sharply.

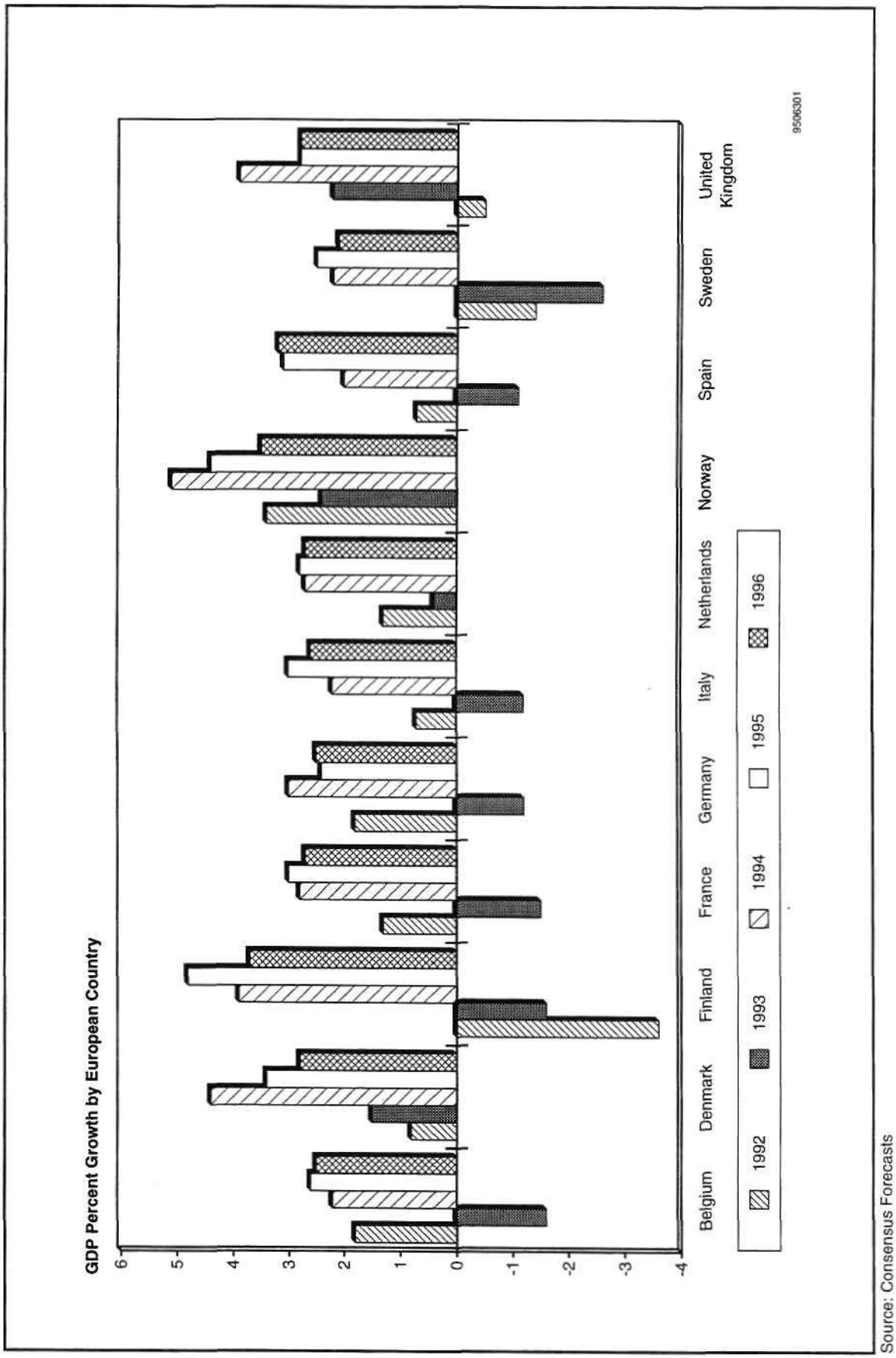
After a low point toward the end of 1993, industrial output turned positive for the first time since early 1991. Revival of activities is feeding into property values, and they appear to be leveling out after their steep, several-year decline. Also, the decline in manufacturing investment intentions across most of Europe came to a halt in 1994 after several down years. Investment is expected to show good growth in 1995 and to continue improving in 1996. Although the outlook for the next few years is much better than it has been of late, the continuing high deficits in the public sectors of the industrialized nations have contributed to declining government investment in many countries. Unemployment, Europe's big problem, will drop only with fundamental labor market reforms. More liberalization of markets is needed. Exports will play an important role in a general economic recovery in Europe, and the signs for this are good as the Pacific Rim countries and China step up their investment.

Looking at the emerging markets of central and eastern Europe, it becomes evident that those former communist countries (the Baltic states, the Czech Republic, Hungary, Poland, the Slovak Republic, and Slovenia) that implemented market reforms are now growing or appear on the threshold of recovery, and their prospects for continued growth are good. But enormous difficulties must still be faced over structural reform in Russia and the Ukraine, where output remains in severe decline, and it may well be several years before the decline in those countries bottoms out.

Following are a set of figures showing the major economic indicators for the various European countries (see Figures 3-1, 3-2, 3-3, and 3-4).

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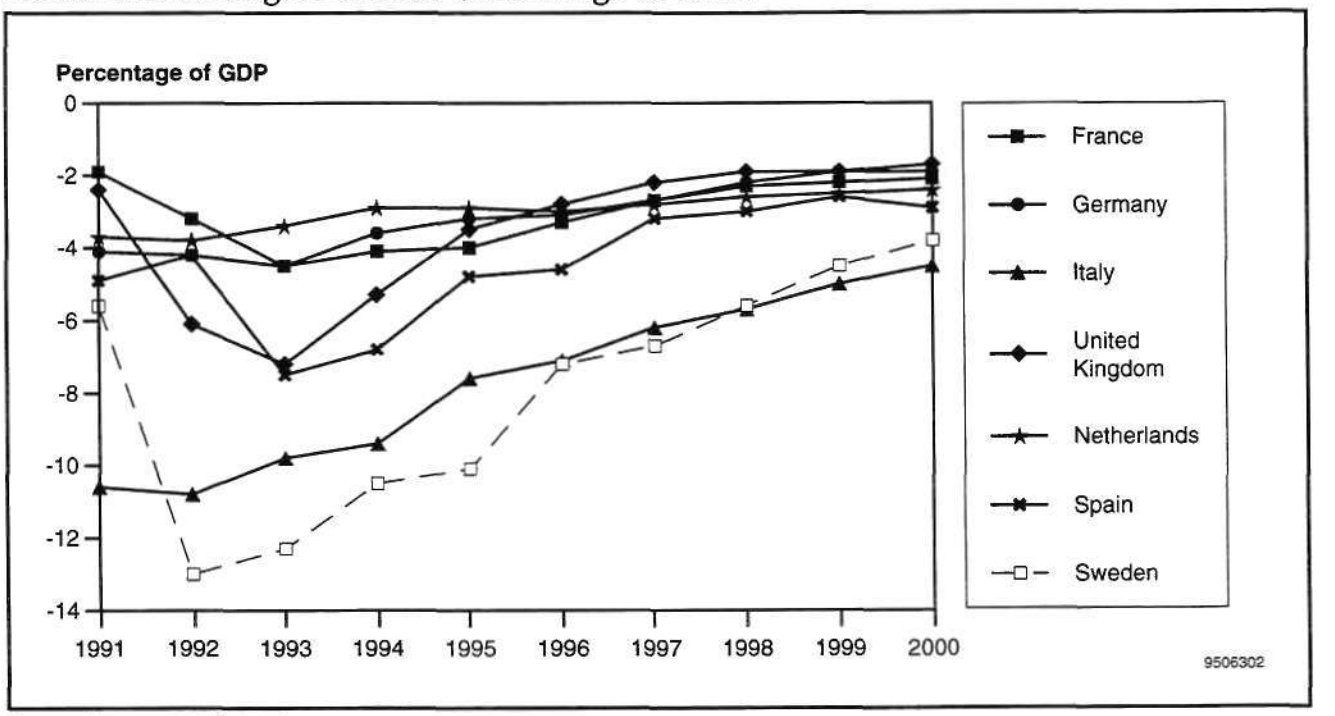
Figure 3-1
GDP Growth by European Country (Percent)



Source: Consensus Forecasts

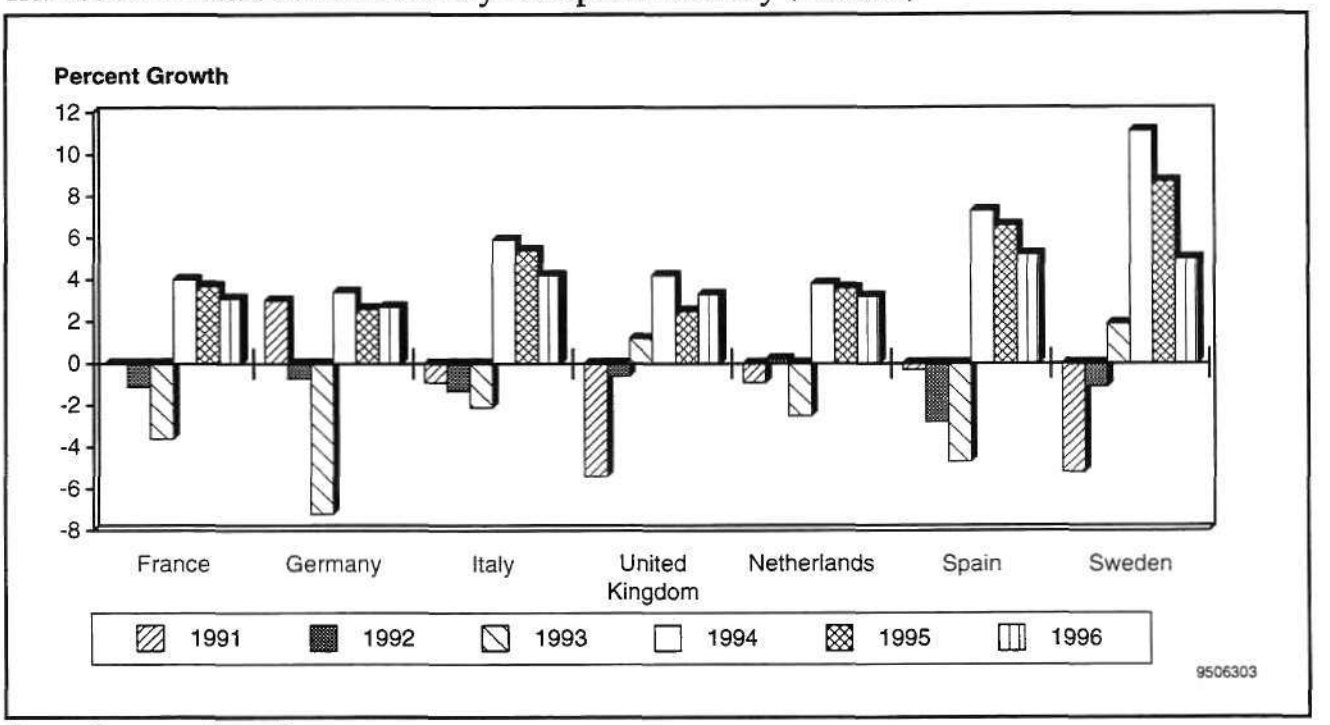
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Figure 3-2
Government Budget Balances (Percentage of GDP)



Source: Consensus Forecasts

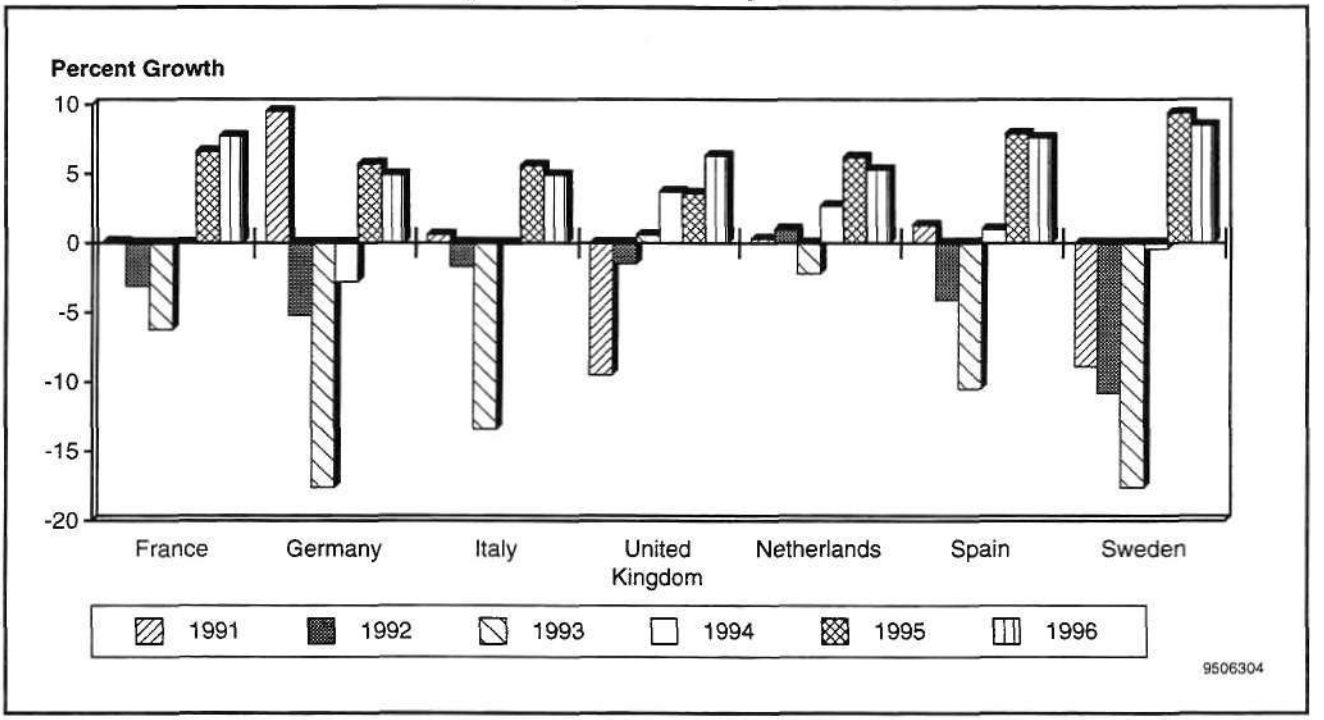
Figure 3-3
Industrial Production Growth by European Country (Percent)



Source: Consensus Forecasts

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Figure 3-4
Business Investment Growth by European Country (Percent)



Source: Consensus Forecasts

European End-User Industries

All the major European end-user industries have been undergoing profound changes for a number of years that have had a significant effect on the growth rates for the various applications of the CAD/CAM/CAE/GIS industry. The following bullet points and accompanying figures provide a snapshot of what has happened in these end-user industries:

- Like the industry worldwide, the aerospace sector was hit by the coincidence of a sharp recession in civil aviation and drastic cuts in defense spending, as governments sought to reap the dividends of the end of the Cold War. Europe could lose its access to a vast area of vital high technology if it allows the aerospace sector to be marginalized. European governments must be prepared to back the industry with indirect support—through defense spending and subsidies for research and development—as the U.S. government does for its aerospace manufacturers.
- The electronics industry in Europe, from computers to semiconductors to consumer electronics, is troubled. The only highlight is the telecommunications sector. It is booming and investing in information technology (IT).
- Power-generating equipment producers are currently prospering from growing demand in the western world for new, cleaner generating methods. In eastern Europe, there is likely to be plenty of work for western companies retrofitting Soviet-designed nuclear power stations. The heavy capital investment required to rebuild eastern Europe's industries and businesses, along with the continuing investment need in western Europe, should get the machinery sector moving.

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- The transportation industry in Europe offers good growth potential for CAD/CAM/CAE/GIS tools. The overstretched road network in most European regions needs sorting out, and the railway industry in particular is undergoing a renaissance.
- The automotive industry recovered from recession in Europe. Markets in countries such as Germany, France, Italy, and Spain were hit by plunging sales during 1993, and returned to growth in 1994. Figures for 1995 are expected to be even better (see Figures 3-5 and 3-6).
- The building/construction industry in Europe is slowly coming out of a very deep recession that hit almost every country across the continent with the exception of Germany, where this industry benefited from the effects of reunification (see Figure 3-7). In 1994, we saw an upturn in some countries such as Spain, some parts of Scandinavia, and Italy.

Eastern Europe

Eastern Europe's conversion to capitalism has been immense, with the removal of communist regimes and the introduction of privatization, but political strife is smoldering everywhere. The eastern countries are heavily in debt, and this will take some time to correct and will cause instability. The entire region is vulnerable to all of the international banking whims. Also, the strength of the single market has caused nonmembers to conform to many of the de facto standards set up by the members, and this enables nonmembers to trade with members. However, conforming is difficult for the central and eastern European countries at such an early stage in their metamorphosis from centralized planning to a market-driven economy, and the varying economies of each European country also make unity difficult.

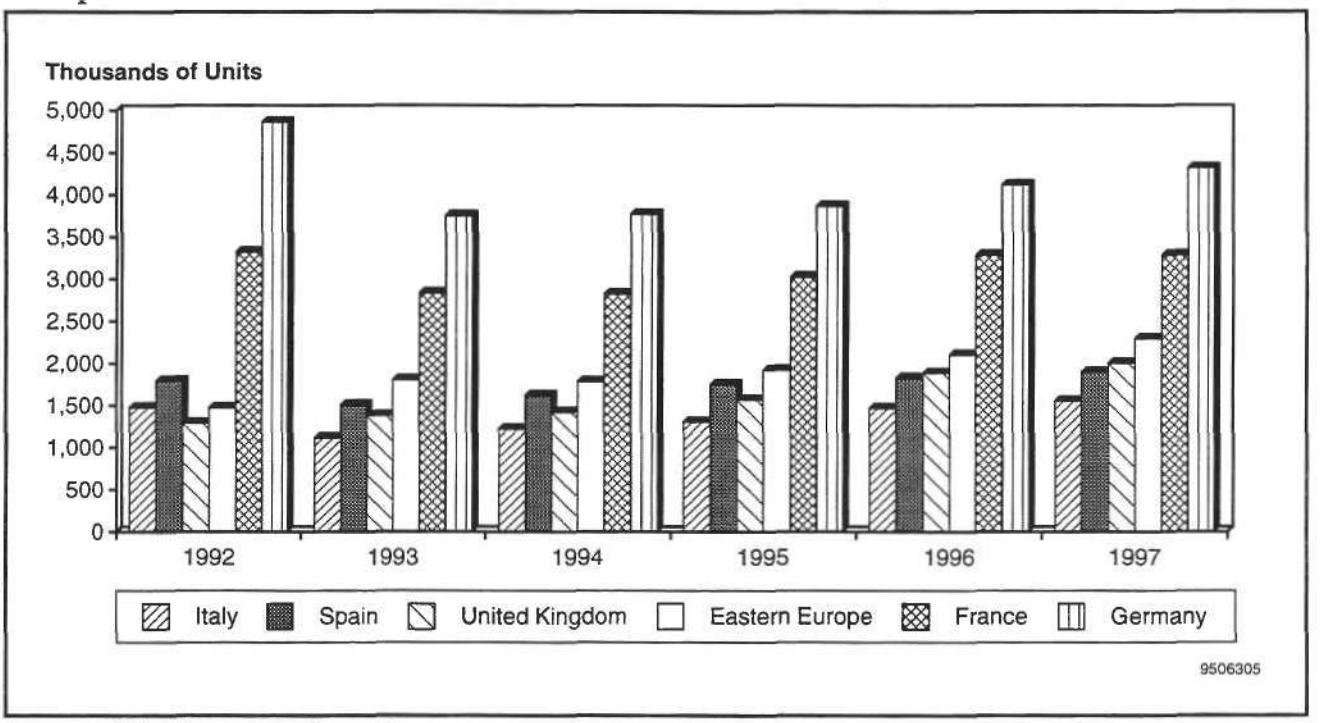
The situation in this part of Europe is turbulent and changing almost daily as these countries gradually open up to international markets and competition. Infrastructure developments are given a very high priority, with telecommunications equipment receiving a greater emphasis than most other developments.

High-technology trade restrictions are no longer preventing the sale of satellite equipment, computers, chips, plant equipment, and so on. The dissolving of the Coordinating Committee for Multilateral Export Control (CoCom) was the final step in an already accelerating process that stripped away virtually all remaining controlled exports. Trade restrictions were one of the major barriers for investment. Perhaps most important, these developments would have been impossible were it not for the speed at which organizations are maturing as businesses. Local companies are now taking on a greater degree of managerial and financial responsibility, making the organization of true joint ventures more realistic. This is partly because of the growing number of people who have experience in the west and who have some training in western-management styles.

There may be considerable economic problems in central and eastern Europe, but there is certainly no shortage of optimism there. This is definitely one of the major future growth areas for CAD/CAM tools. Privatization and the formation of new companies are key drivers in this region. Financing can be found, especially for public and large-scale

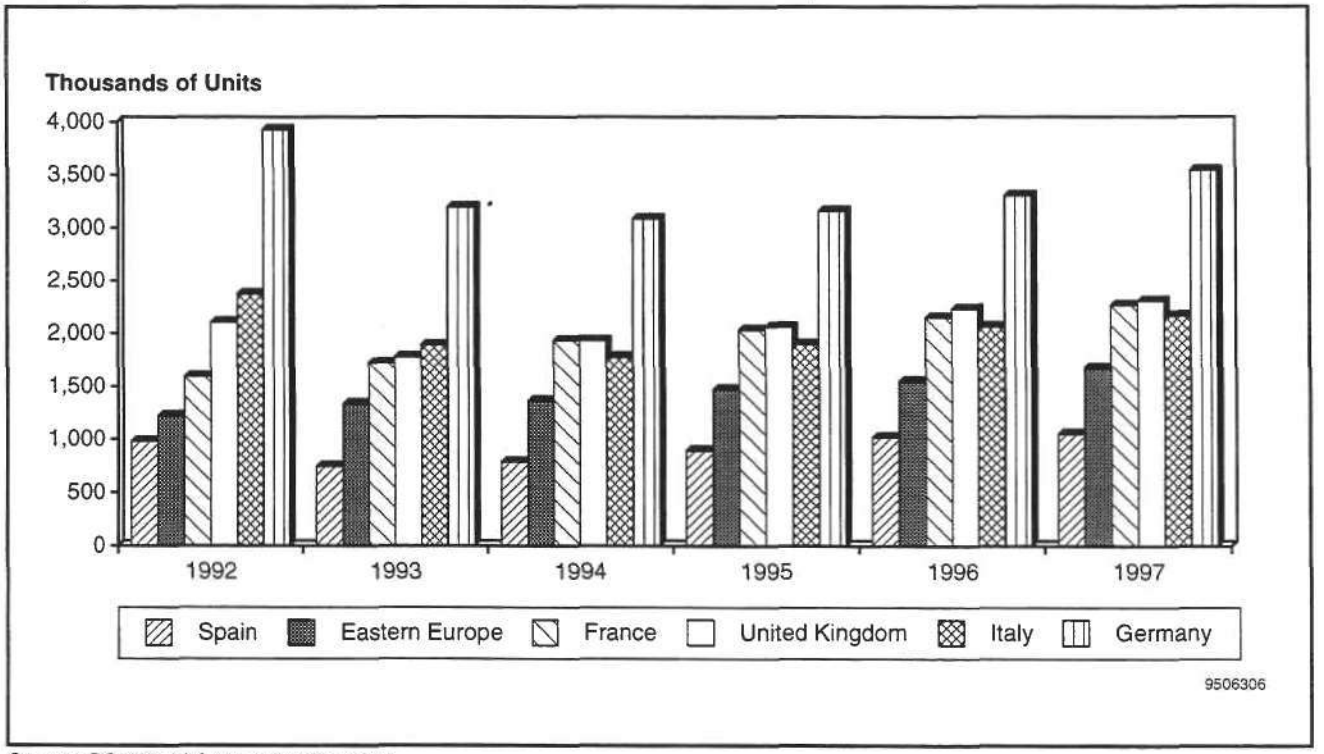
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Figure 3-5
European Car and Production Forecast (Thousands of Units)



Source: DRI World Automotive Forecast

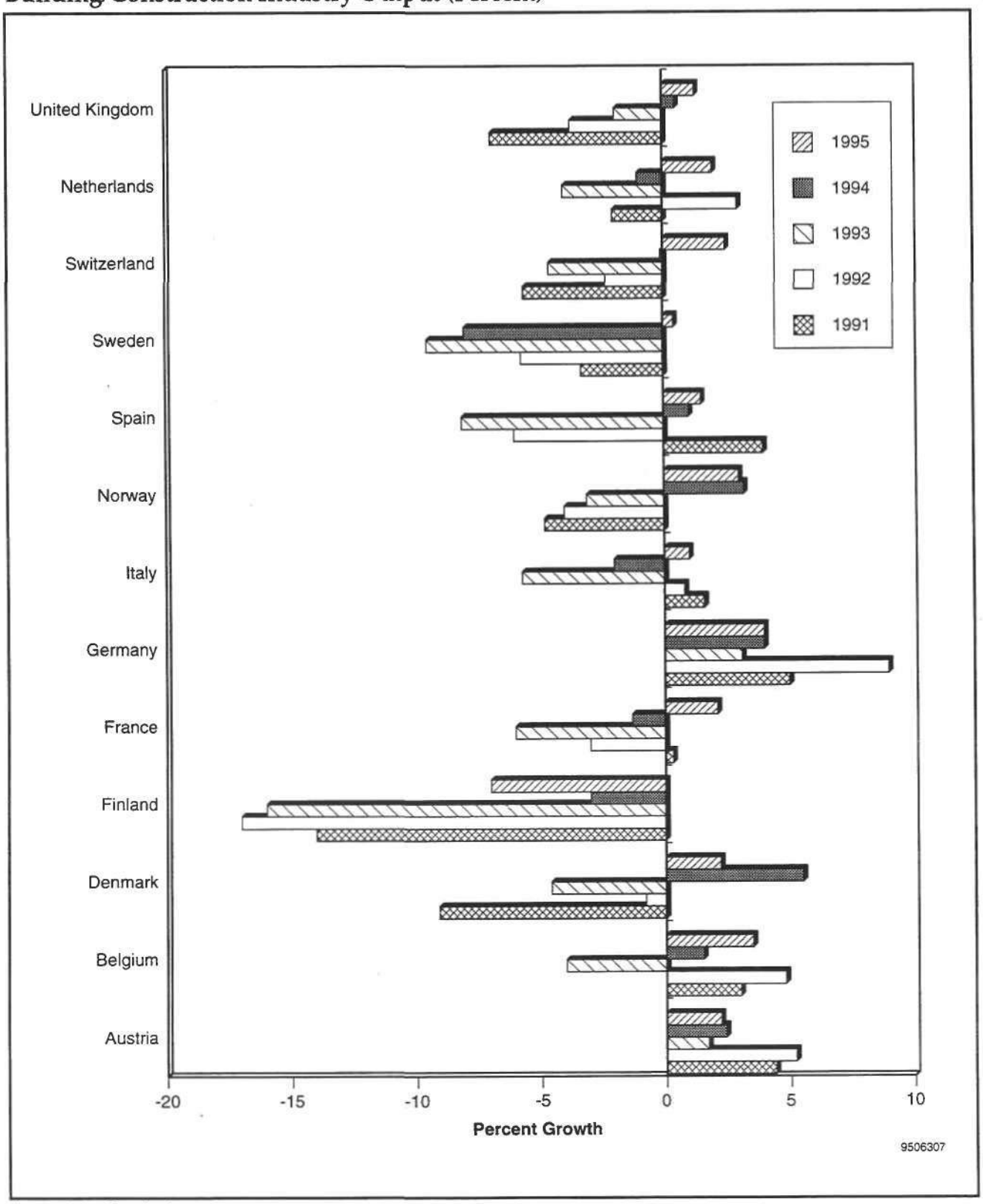
Figure 3-6
European New Car Sales Forecast (Thousands of Units)



Source: DRI World Automotive Forecast

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Figure 3-7
Building/Construction Industry Output (Percent)



Source: EuroConstruct

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infrastructure projects. Telecom is a critical need in this part of the world, and the development of industry will follow. High-quality international and intercity telecommunications links already exist via high-speed digital optical fiber links. Now only the cities themselves need to be modernized.

The region is very much a Windows-based market, but piracy has been a big problem. Many suppliers have preferred to supply customized software rather than packages to overcome piracy problems. Overall, some eight illegal copies of software exist for every legal copy, but this is changing now that a legal framework exists. There are now channels consisting of sophisticated distributors and value-added resellers (VARs). Computer 2000 and Autodesk have pioneered market entry into some of these countries.

The size of these countries, measured both in square kilometers and in population, varies enormously, as does the time scale over which the country will become developed as a market for high-tech goods such as CAD/CAM/CAE/GIS products.

Central European countries emerged first from the eastern bloc. These are the countries that offer the greatest short-term opportunities.

Sources used for this report include the following:

- Financial Times
- Consensus Forecasts
- EuroConstruct
- DRI World Automotive Forecast
- World Bank
- OECD
- IMF
- DTI
- Barclays Bank
- EBRD

The Continuing Impact of Currency Shift

Fluctuating exchange rates once again masked the true market performance in the 1994 CAD/CAM/CAE and GIS market. European CAD/CAM/CAE and GIS software grew 12.3 percent from 1993 to 1994 when measured in U.S. dollars. However, the dollar depreciated 1.5 percent against the ECU, so European CAD/CAM/CAE and GIS software revenue grew 10.8 percent from 1993 to 1994 when measured in ECU. Table 3-1 highlights the effect the fluctuations in the dollar exchange rate had on the results of European CAD/CAM/CAE/GIS vendors. Most U.S.-based vendors report to us in dollars using their own internal conversion rate, which is fixed for several years.

Looking ahead, currency fluctuations will continue to be felt in all global markets. The dollar has continued to weaken during the early months of

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Table 3-1
Dollar Exchange Rate Changes by European Country

		Actual					Current	Current	Year-to-Year Change (Percent)					
Country	Currency	1990	1991	1992	1993	1994	1995	1996	1990-1991	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996
Austria	Schilling	11.36	11.67	10.95	11.65	11.4	10.17	10.3	2.7	-6.2	6.4	-2.1	-10.8	1.5
Belgium	Franc	33.41	34.13	32.02	34.67	33.66	29.72	30.2	2.2	-6.2	8.3	-2.9	-11.7	1.5
Denmark	Krone	6.18	6.39	6.02	6.49	6.35	5.65	5.7	3.4	-5.8	7.8	-2.2	-11.0	0.8
Finland	Markka	3.82	4.04	4.45	5.73	5.21	4.40	4.4	5.8	10.1	28.8	-9.1	-15.5	-0.4
France	Franc	5.44	5.64	5.27	5.67	5.54	5.02	5.0	3.7	-6.6	7.6	-2.3	-9.4	0.5
Germany	D-Mark	1.62	1.66	1.56	1.66	1.62	1.45	1.5	2.5	-6.0	6.4	-2.4	-10.8	1.5
Italy	Lira	1,197	1,239	1,228	1,578	1,609	1,637.59	1,625.0	3.5	-0.9	28.5	2.0	1.8	-0.8
Netherlands	Guilder	1.82	1.87	1.75	1.86	1.82	1.62	1.6	2.7	-6.4	6.3	-2.2	-11.1	1.5
Norway	Krone	6.25	6.49	6.18	7.11	7.04	6.38	6.4	3.8	-4.8	15.0	-1.0	-9.4	0.7
Spain	Peseta	102	103.8	101.9	127.9	133.5	125.50	125.4	1.7	-1.8	25.5	4.4	-6.0	-0.1
Sweden	Krona	5.92	6.04	5.81	7.82	7.7	7.32	7.3	2.0	-3.8	34.6	-1.5	-4.9	-0.2
Switzerland	Franc	1.39	1.43	1.4	1.48	1.37	1.20	1.2	2.9	-2.1	5.7	-7.4	-12.7	0.5
United Kingdom	Pound	0.56	0.57	0.57	0.67	0.65	0.63	0.6	1.8	0	17.5	-3.0	-2.4	1.6
Europe Average	ECU	0.79	0.808	0.769	0.857	0.844	0.78	0.8	2.3	-4.9	11.4	-1.5	-7.8	0.8

Source: Dataquest (October 1995)

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this year, so if we were to assume a stable currency for the remainder of this year, 1995 will end with the dollar depreciating nearly 8 percent against the ECU. Although Dataquest does not forecast currency exchange rates, we do forecast with the best information available. The exchange rate is calculated as the simple arithmetic mean of the 12 monthly average rates for each country. For the purpose of this forecast, Dataquest assumes the August exchange rate will remain stable in the future.

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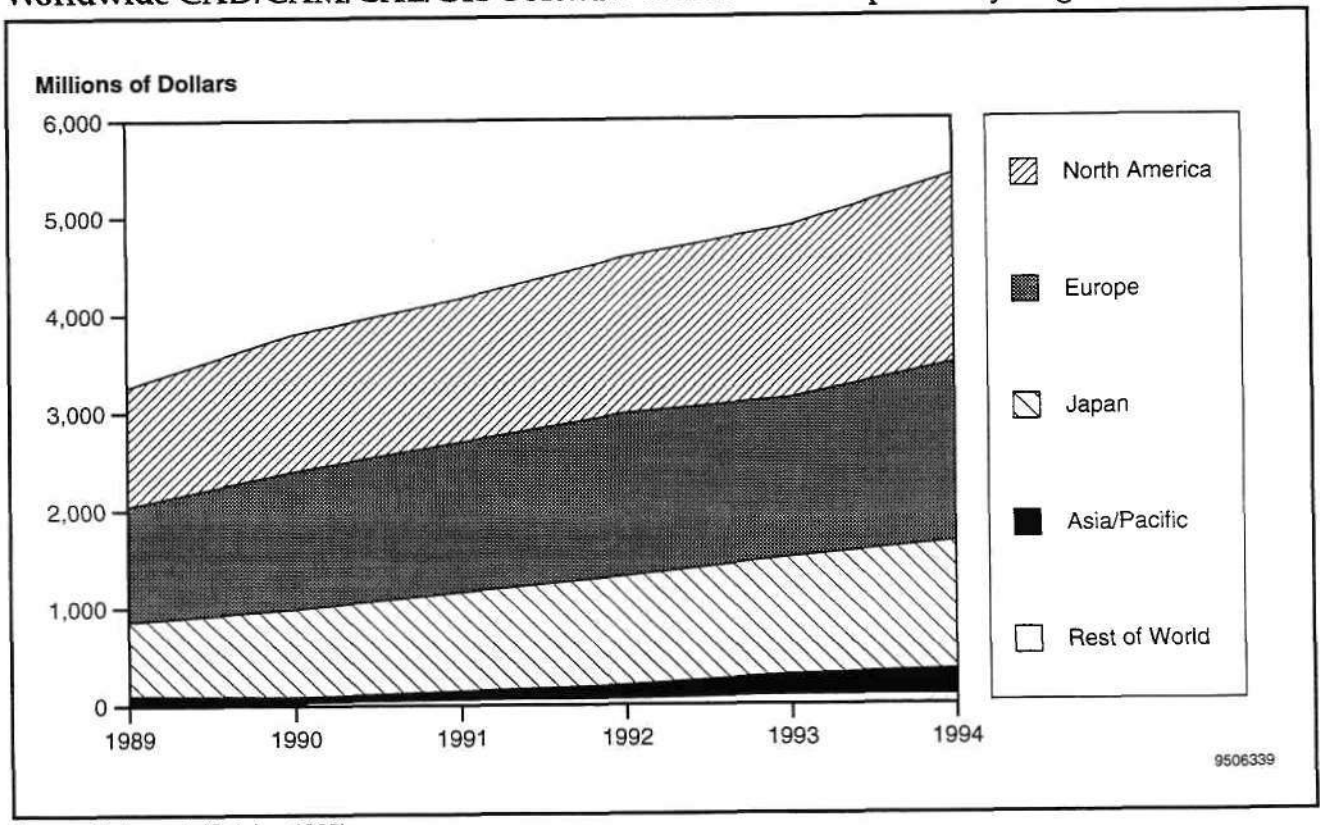
Chapter 4
Market Analysis

The European CAD/CAM/CAE/GIS Market

The European CAD/CAM/CAE/GIS market, representing the world's largest regional market for this segment in terms of total revenue and software revenue until the beginning of 1993, suffered a setback in 1993 and lost its leading position. In 1994 some of this loss in market share was recovered. The region accounted for 34 percent of total CAD/CAM/CAE/GIS product sales in 1994 and 33 percent of software revenue (see Figure 4-1).

Europe comprises many countries, each with unique market characteristics. Europe accounted for 34 percent of the world's total CAD/CAM/CAE/GIS product sales and 33 percent of software sales for 1994. Overall, the European CAD/CAM/CAE/GIS market grew 9.1 percent in 1994 to $5.8 billion in total factory revenue. Software revenue increased 12.3 percent to $1.8 billion. Currency fluctuations are complicating the picture. The dollar depreciated slightly against European currencies in 1994, which had a positive impact on growth in the European countries (see Table 3-1). Calculating the European revenue in ECU, the market grew 7.4 percent in terms of total revenue and 10.4 percent in software revenue.

Figure 4-1
Worldwide CAD/CAM/CAE/GIS Software Market Development by Region



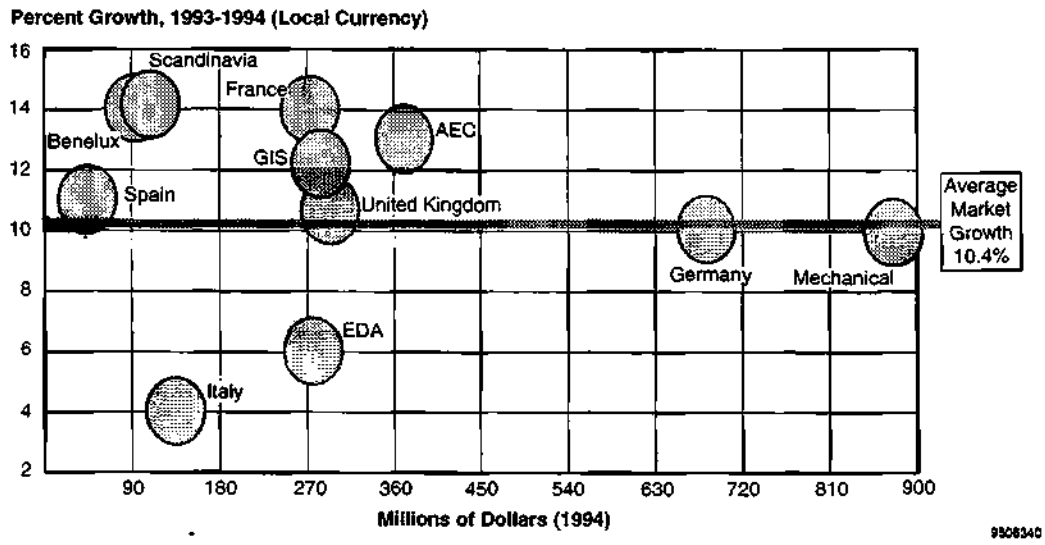
Source: Dataquest (October 1995)

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Each European country represents a different market, requirements, languages, and so on. This makes it more difficult, slower, and more expensive for vendors to sell products in Europe and that means these markets mature more slowly in Europe. Figures 4-2 and 4-3 provide a look at the activities in the European CAD/CAM/CAE/GIS software industry, indicating market size and market growth rate for each segment and each European region. In Figure 4-2, as well as the remaining software-market portfolios throughout this document, the heavy horizontal line indicates the industry average for software revenue growth; the positions of the bubbles indicate their segment or regional growth rates (x-axis) and segment or regional sizes (y-axis) for 1994. Growth is shown in local currency terms for CAD/CAM/CAE/GIS in Europe by region and application. To enable comparison between the regions, the actual market sizes in Figure 4-2, as well as the remaining software-market portfolios, are given in U.S. dollars.

Of the total European CAD/CAM/CAE/GIS software revenue, U.S.-based vendors had 63 percent and European vendors 36 percent in 1994. This indicates a gain of market share for U.S.-based vendor over 1993, when the distribution was 62 percent for U.S.-based vendors versus 37 percent for European vendors; the Asian vendors' share was negligible. However, when looking at this distribution, we must remember that several of the products sold by U.S.-based vendors are actually developed in Europe. The leading example of this is the CATIA system, developed by Dassault Systémes, for which IBM has the sole distribution rights. Other examples include Computervision's Medusa product, Hewlett-Packard's Precision Engineering products, GDS, and the solid modelers Acis and Parasolids.

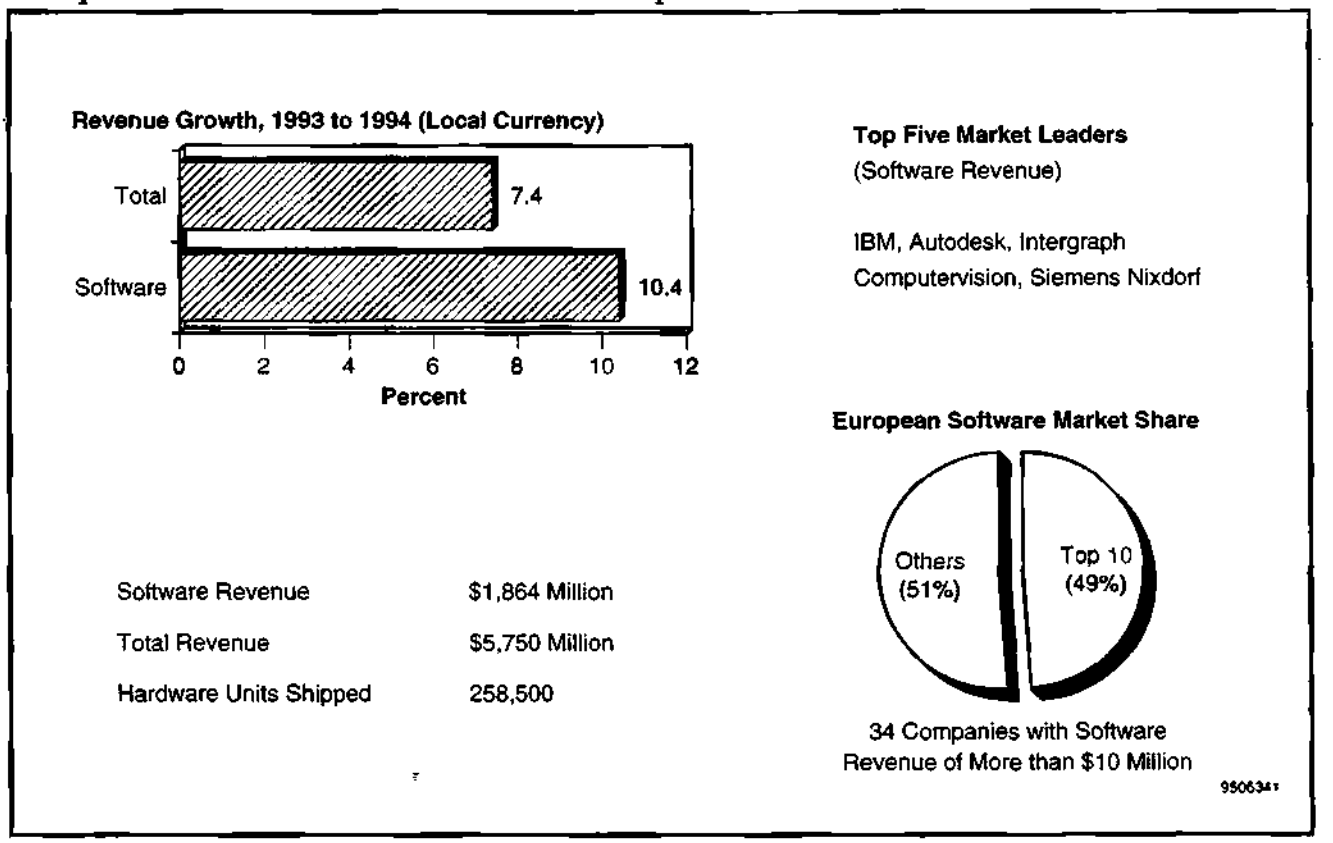
Figure 4-2
European CAD/CAM/CAE/GIS Software Market Portfolio



Source: Dataquest (October 1995)

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Figure 4-3
European CAD/CAM/CAE/GIS Market Snapshot



Source: Dataquest (October 1995)

The share of European vendors is declining for many reasons. First, it is much more difficult to find venture capital or other start-up funding in many countries of Europe than it is in North America. Much of the CAD/CAM/CAE/GIS industry in the United States is driven by people leaving one company and starting a new company with new ideas. These start-ups often include veterans of the vendor and user companies. This happens to a greater extent in the United States because of the critical mass and partnership situation existing there. Marketing is another issue, and many European companies are extremely reluctant to invest in the right kinds of marketing organizations. Marketing, market research, and press relations all cost money, and companies must be prepared to pay for these things. A third factor is that many European vendors operate only in their country of origin and one or two other countries. As a result, these vendors have suffered. Operating in a comparatively small region does not generate enough revenue to keep up the R&D investment necessary to continue to produce competitive products.

In terms of market share, the position of the top 10 CAD/CAM/CAE/GIS software vendors changed only slightly from 1993. As a group, these top vendors increased market share and accounted for 50 percent of the total European software revenue, compared with 49 percent in 1993. The new entrant among the top 10 was ESRI, which replaced EDS Unigraphics (see Table 4-1). Parametric Technology as usual was the growth leader among the top 10. The companies that showed good growth in 1994 were the companies that managed to successfully sell into the small and

Table 4-1
Top 10 CAD/CAM/CAE and GIS Software Vendors' Size and Growth in Europe

Company	1994 ($M)	Growth (%)	1993 Ranking
IBM	184.8	21.3	1
Autodesk	149.9	14.0	2
Intergraph	109.1	4.6	3
Computervision	98.0	-4.4	4
Siemens Nixdorf Informationssysteme	83.0	0.5	5
Parametric Technology	69.7	72.4	9
Matra Datavision	63.4	19.7	6
Nemetschek	58.1	30.1	8
ESRI	48.4	34.7	12
Hewlett-Packard	46.9	-0.7	7
Top 10 Companies	911.3	14.5	
All Companies	1,824.2	12.1	
Top 10 Companies (ECU)	768.8	12.7	
All Companies (ECU)	1,538.9	10.4	

Source: Dataquest (October 1995)

medium-size businesses. During 1994 we still observed that in many cases the large accounts deferred purchases. The companies that tended to focus on these key accounts faced problems. During 1995 we are also seeing an upturn in investment in the large end-user companies with news of several very large orders across Europe.

CAD/CAM/CAE/GIS Major Global Trends

The following is a list of trends we observed that impacted the overall growth figures for the CAD/CAM/CAE/GIS market on a global scale.

Technology

Computing performance is continuing to improve at an exponential rate. The resulting technological improvements drive further demand for improved software solutions.

Indispensability

As complexity increases in both the design and the design process, the benefits of automation improve dramatically. This, coupled with market pressures to produce higher quality products and to reduce cycle time, is making CAD/CAM/CAE/GIS a necessity.

Late Buyers

A significant pool of untapped users still exists in mechanical, AEC, and GIS applications, driving additional growth. These conservative buyers will favor market leaders and installed systems for compatibility. For vendors, therefore, the value of high market share and customer satisfaction will increase.

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Desktop Dominance

The turf war for desktop dominance has been building steam since the introduction of the Pentium chip and Windows NT, which will fight to take market share from the higher-priced, multiple UNIX operating systems with RISC technology. The decline of host-dependent systems is also continuing, with replacements going to networked, desktop systems. Vendors whose business models depend on high-priced workstations are threatened by these powerful new PCs. At the same time, the replacement of host systems provides them with opportunity for growth.

Unbundling of Software

Software vendors have ported to multiple platforms. The market is quickly moving from proprietary to open systems, resulting in a shift from bundled to unbundled software.

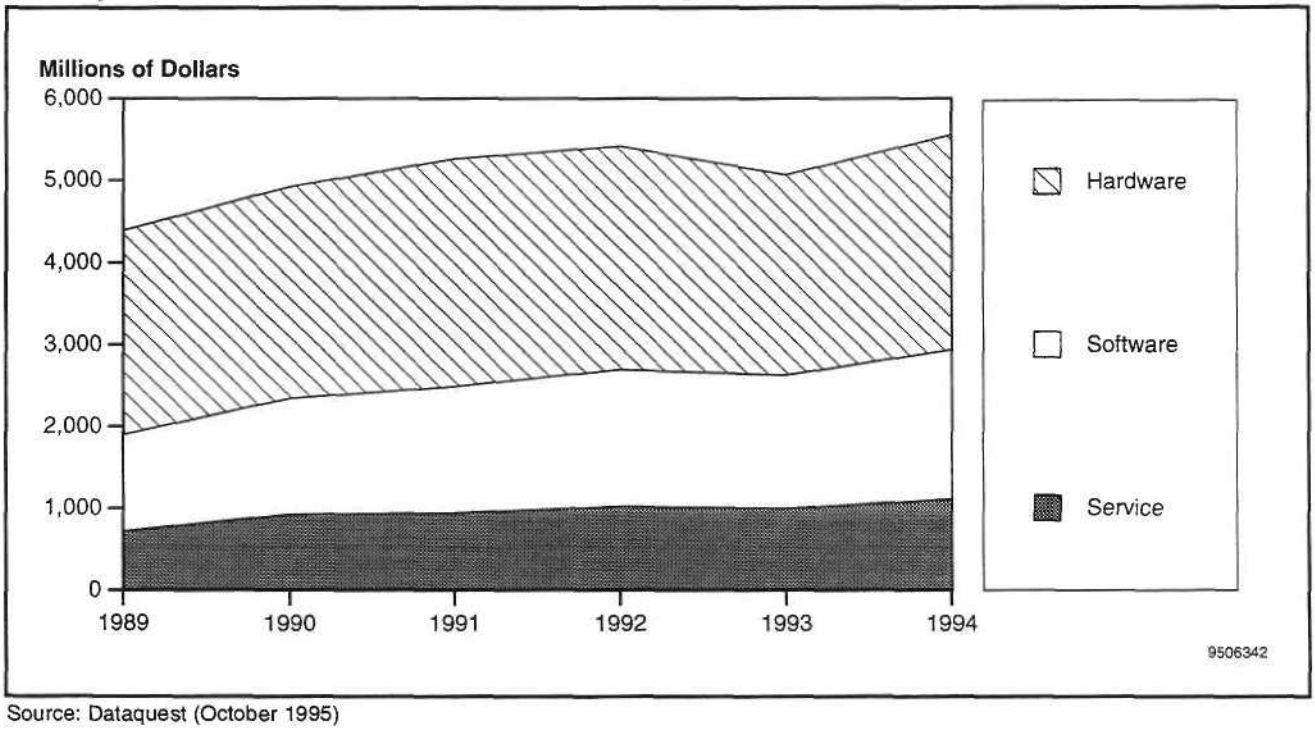
Replacement Market

The replacement market is gaining importance, as illustrated by the fact that over 50 percent of all seats sold in 1994 were replacement seats. Over the next five years, owing to the aging installed base of these technical markets, replacements will dominate sales at over 60 percent. Except for the GIS/mapping market, early adoptions are complete.

European Market Development by Component

We have seen, as in some other parts of the world, an increase in service revenue. This can partly be attributed to the fact we now include consulting revenue and other professional services in this figure. As expected, the share of hardware continued to decline (see Figure 4-4).

Figure 4-4
Average CAD/CAM/CAE/GIS Market Development by Component



Source: Dataquest (October 1995)

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Changing Distribution Models

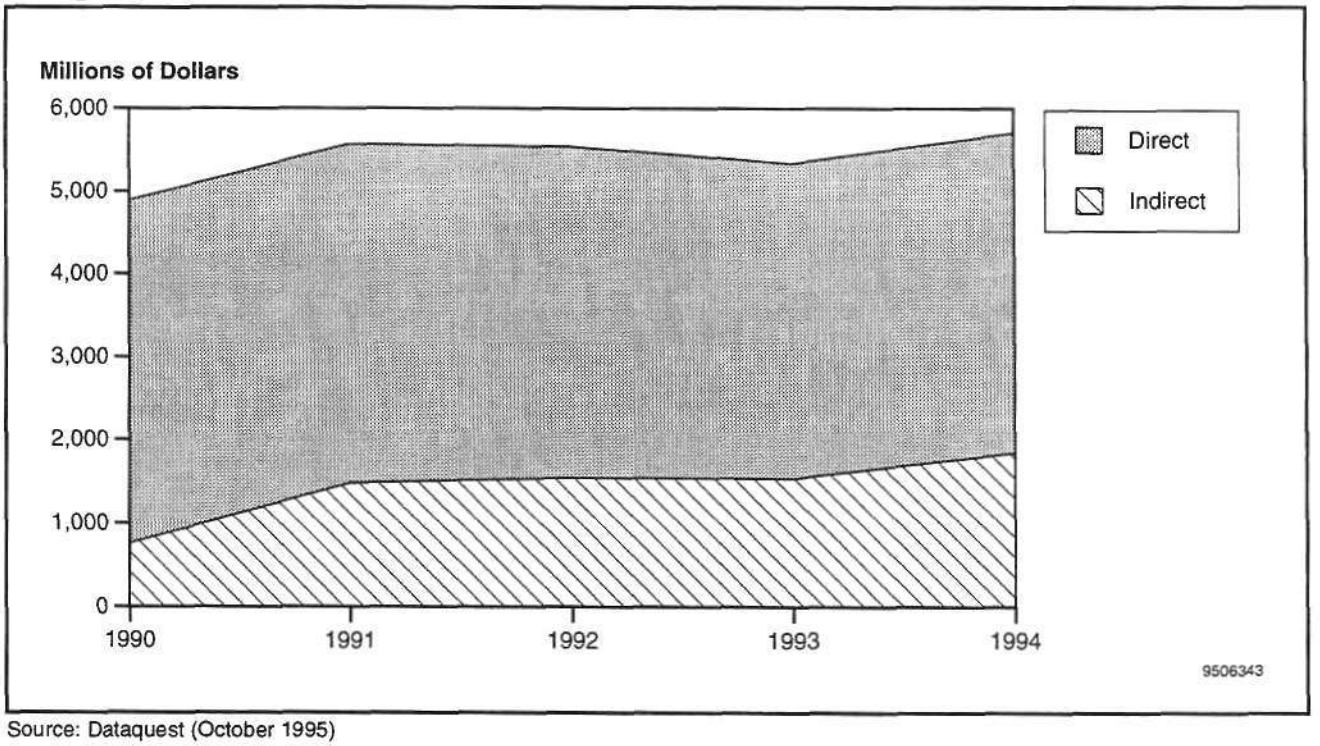
Because Europe comprises a number of separate countries, each with its own language and culture, distribution and support become key issues. It is not possible to emulate a typical U.S. situation and install a single toll-free number as a support hotline for the whole of Europe. Support must be closer to the customer. Each country needs its own sales and support office staffed with people speaking the local language. For that reason, it costs more to do business in Europe.

In general, most vendors (certainly the larger ones) use a direct salesforce to reach large companies within the larger markets, and indirect channels (dealers and distributors) to reach smaller companies in more distributed, fragmented markets.

These distribution efforts resulted in a shift of market share from 84 percent for direct channel revenue in 1990 to a 68 percent share for the direct channel in 1994 (see Figure 4-5). It is true that direct channels offer greater margins when the business is available, but they are also where the greatest costs can be found.

This slowdown of the direct channel reflects the relative saturation and retrenchment of large companies.

Figure 4-5
European CAD/CAM/CAE/GIS Revenue: Direct versus Indirect Sales Channels



Source: Dataquest (October 1995)

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Quite a number of small VARs have been making good business out of combining in-house software with tools from several sources and selling the solutions to small and medium-size companies.

A myriad of small companies in Europe are involved in mechanical, electronic, and architectural design. These companies do not have big budgets and they represent a very fragmented market that is expensive to penetrate. The cost of sales as a percentage of the sale value is much higher than selling to a big company.

The requirements of many small companies are quite different than those of large companies. Small companies do not have internal CAD/CAM/CAE support groups, so they need good local support. They often provide subassemblies to larger companies and therefore need to demonstrate compatibility with the larger companies' CAD/CAM/CAE tools.

These small companies offer advantages to the CAD/CAM/CAE vendor. The small-company sector is less penetrated than the large-company sector, so the market is wide open for all kinds of tool sales. And many of the larger companies have been hit the hardest by recession. These large companies have more tools than they know what to do with, and they are cutting costs, laying off employees, and restructuring.

Also, small companies may have difficulty finding money, but there is much less bureaucracy involved in getting them to spend that money. If it makes sense for the business, the company will find the money. Large companies are much less flexible in their financing.

Operating Systems

The CAD/CAM/CAE/GIS market in Europe remains predominantly UNIX-based in terms of software revenue. In 1994, UNIX-based software sales made up 68 percent of the market, while DOS/Windows software made up 26 percent of the market. Host-based systems declined to just 4 percent of the market, and Windows NT-based sales accounted for the remaining 2 percent (see Figure 4-6).

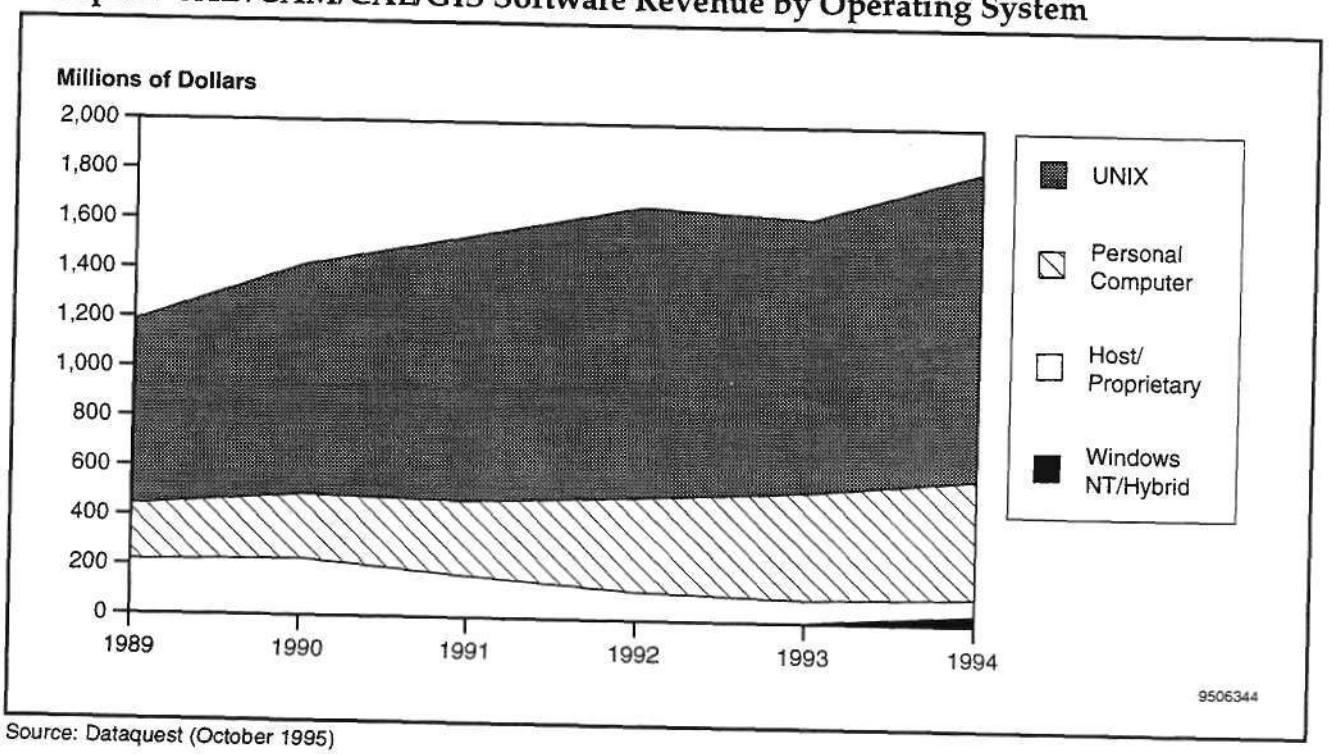
Major Market Segments

Following is a brief analysis of the CAD/CAM/CAE/GIS market in Europe by application. Because the drivers for each of these applications differ depending on regional, economic, and cultural differences, it is also important to analyze these drivers on a regional level. (Appendix A highlights the leading vendors in the various European regions in terms of total revenue and software revenue.)

The proportional split of software revenue by application changed in distribution from 1993 to 1994, with actual percentages varying by only 1 percentage point or less from last year's picture or from the general worldwide pattern. Mechanical and EDA both lost 1 percentage point. GIS and AEC software gained 1 percentage point over 1993 (see Figures 4-7 and 4-8). In terms of actual software revenue growth based on ECU for the various applications in 1994, the AEC sector showed a 13 percent gain over 1993, followed by GIS applications with 12 percent growth. Mechanical CAD/CAM/CAE software revenue grew nearly 10 percent, and EDA applications increased by 6 percent (see Figure 4-1).

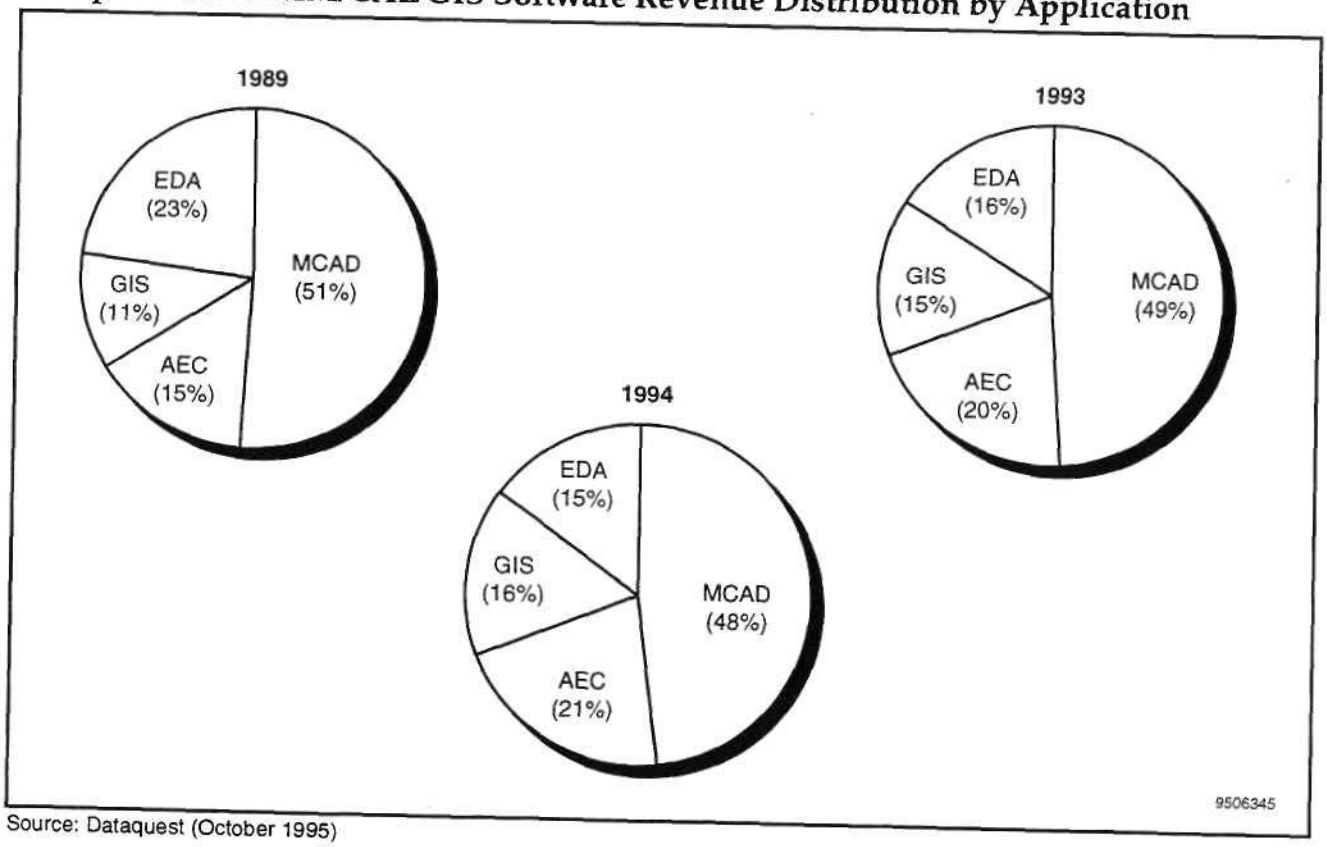
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Figure 4-6
European CAD/CAM/CAE/GIS Software Revenue by Operating System



Source: Dataquest (October 1995)

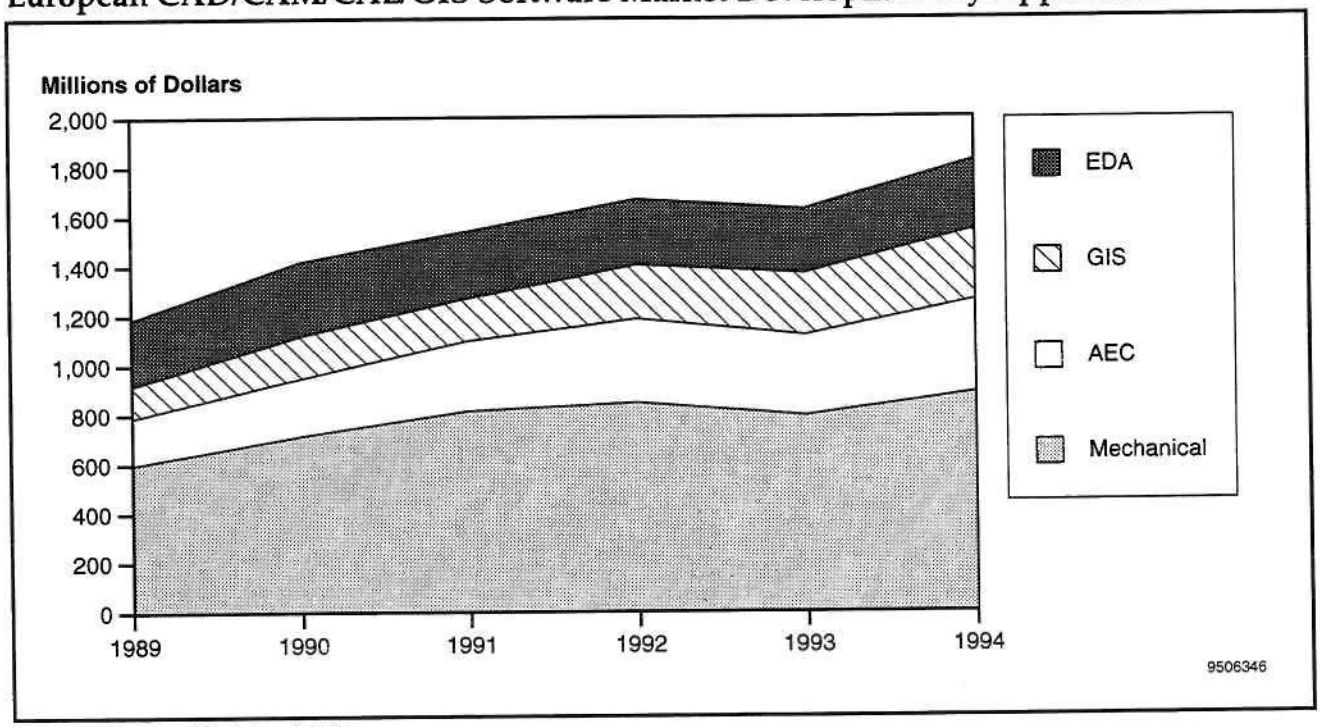
Figure 4-7
European CAD/CAM/CAE/GIS Software Revenue Distribution by Application



Source: Dataquest (October 1995)

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Figure 4-8
European CAD/CAM/CAE/GIS Software Market Development by Application



Source: Dataquest (October 1995)

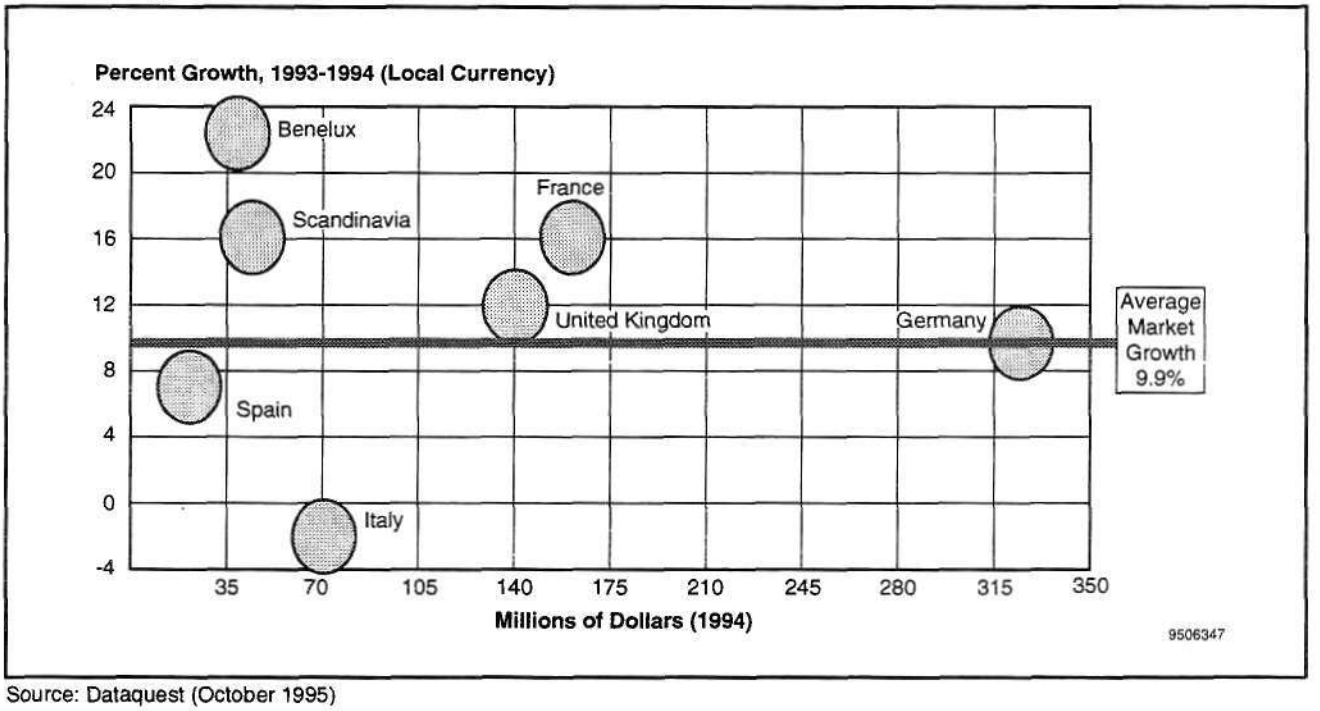
Mechanical

The market for mechanical CAD/CAM/CAE software recovered during 1994 following the overall economic situation in the manufacturing industry in Europe. The German, French, and United Kingdom manufacturing industries in particular—by far the largest consumers of mechanical CAD/CAM/CAE products in Europe—returned to good growth, and this pulled up the growth rate of the overall European mechanical CAD/CAM/CAE software market (see Figure 4-9).

Mechanical applications, which totaled $884 million, had a 48 percent share of the total European CAD/CAM/CAE/GIS software market in 1994 (compared with 49 percent in 1993 and 51 percent in 1992) and increased by nearly 10 percent in software revenue based on ECU in 1994. The top 10 vendors actually grew nearly 13 percent and now control 69 percent of this market, compared with 67 percent in 1993 (see Table 4-2). There were no new entrants but a little reshuffle of positions among the top 10, with PTC as growth leader reaching the third position. Among the European companies, Matra Datavision stands out as the only European company that has made it among the top 10 on a worldwide level in a market that is heavily dominated by U.S.-based vendors. U.S.-based vendors had a 70 percent share of the mechanical CAD/CAM/CAE software market, with European vendors holding the rest. Over the last few years, we have seen the share of European vendors decline in favor of U.S.-based vendors. This trend is caused by several factors: U.S. vendors' acquisitions of several European companies (Norsk Data, Isykon product line), local mergers and acquisitions (Straessle acquired Nestler and Fides and, most recently, Siemens Nixdorf's product line, Matra Datavision acquired Cisigraph), and the fact companies have simply pulled out of this market.

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Figure 4-9
1994 European Mechanical CAD/CAM/CAE Software Market Portfolio



Source: Dataquest (October 1995)

Table 4-2
Top 10 Mechanical CAD/CAM/CAE Software Vendors' Size and Growth

Company	1994 ($M)	Growth (%)	1993 Ranking
IBM	163.3	23.0	1
Computervision	91.4	-1.0	2
Parametric Technology	69.7	72.4	5
Matra Datavision	63.4	20.7	4
Autodesk	60.1	14.3	3
EDS Unigraphics	44.1	17.2	7
Hewlett-Packard	37.3	-2.7	6
SDRC	27.8	12.2	10
MacNeal-Schwendler	27.7	-19.1	8
Siemens Nixdorf	24.2	-5.8	9
Top 10 Companies	609.0	14.6	
All Companies	884.4	11.6	
Top 10 Companies (ECU)	513.8	12.9	
All Companies (ECU)	746.1	9.9	

Source: Dataquest (October 1995)

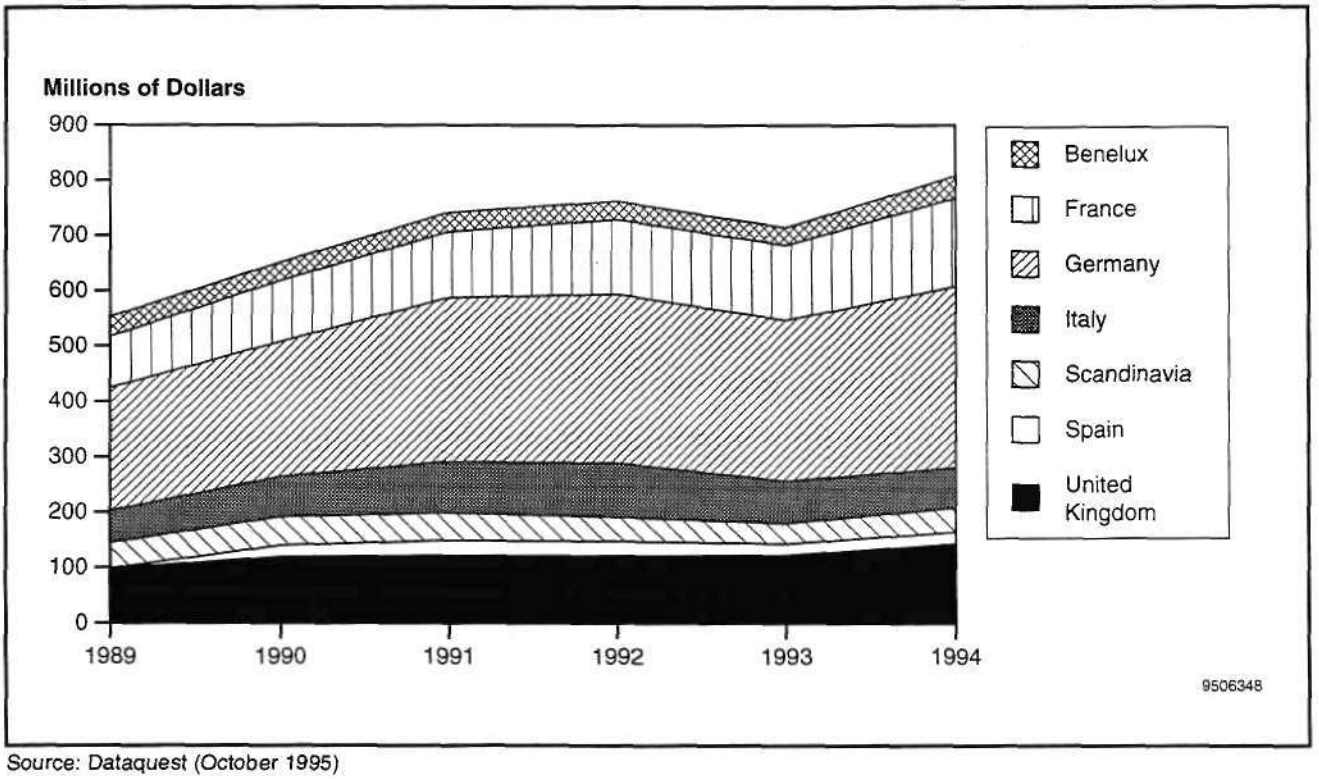
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The decline also it makes sense when looking at the history of the mechanical CAD/CAM/CAE market. The large accounts started investing in CAD when there were mostly U.S.-based software vendors operating in this market. With very few exceptions (that is, Matra Datavision and Dassault Systémes), European companies entered the market later, when the major accounts were already penetrated with U.S.-based products. The best opportunities for European companies now are in industry sectors dominated by small and medium-size companies such as the industrial machinery industry. Companies such as Strässle are very successful in this sector. However, in order to reach a leading position in this market sector, the company will have to become more international. Figure 4-10 shows the European mechanical CAD/CAM/CAE software market development by region.

The mechanical CAD/CAM/CAE market remains predominantly UNIX-based. In 1994, UNIX software sales made up 75 percent of the market, while DOS/Windows software made up 17 percent of the market. Host-based systems declined to 6 percent of the market, and Windows NT-based sales accounted for the remaining 2 percent (see Figure 4-11).

An initiative that has the potential to transform the European manufacturing industry came to life at the end of 1993. Advanced Information Technology in Design and Manufacturing (AIT), headed up by Daimler Benz, is intended to strengthen the competitiveness of Europe's key manufacturing industries (automotive, aerospace, component supplier, machine-tools/equipment, and so on). It aims to achieve this goal via two consecutive actions initiated by industry with support of the European Commission. The first action is a consensus among the European users and

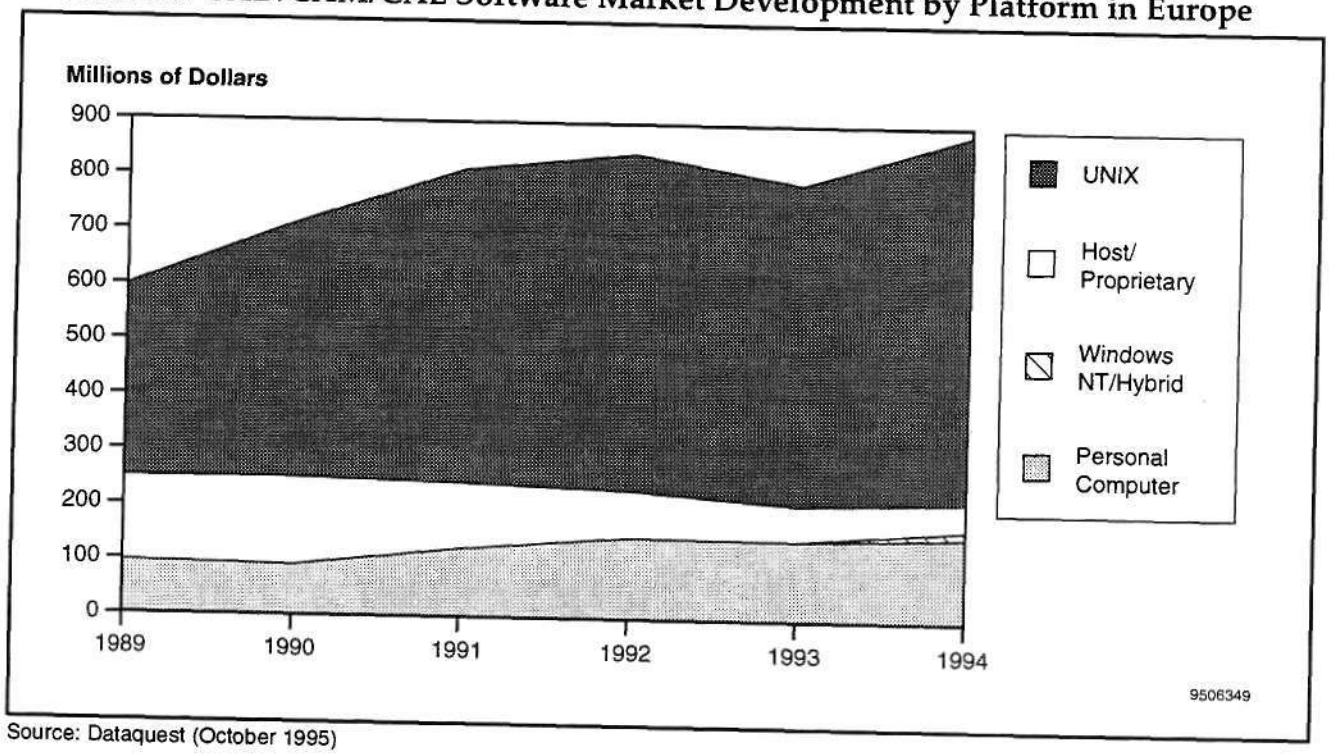
Figure 4-10
European Mechanical CAD/CAM/CAE Software Market Development by Region



Source: Dataquest (October 1995)

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Figure 4-11
Mechanical CAD/CAM/CAE Software Market Development by Platform in Europe



Source: Dataquest (October 1995)

suppliers of information technology (IT) for the most important future requirements on design and manufacturing practice; the second action is an IT R&D initiative to support these commonly defined requirements.

These trends give a clear indication that the European manufacturing industry is going through a major transformation to remain competitive in a more and more global economy.

AEC

The European construction industry, like the economy of the region, recovered during 1994. Except in the United Kingdom and France, investment in AEC software improved again in 1994. In the United Kingdom and France, the building sector is still weak, although the overall economy has improved. In these two countries, the situation has not been helped by the overdevelopment of offices in the late 1980s; many office buildings still remain empty. In Germany, investment in AEC software has been booming ever since reunification fueled a major restructuring of infrastructure, from underground stations to roads to new parliament buildings.

Apart from economic trends, there are more general trends affecting the AEC sector worldwide.

Large design firms are growing at the expense of smaller firms. These large end users increasingly require their employees and suppliers to adopt automation tools in the design and construction process. Smaller design firms must increasingly buy CAD systems or risk being dropped from consideration as a partner.

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CAD purchases are increasingly justified as competitive advantages in both sales and design reviews. Electronic design data is also required downstream by the designer's clients, from central government down to the small commercial developer. Also, a significant pool of untapped users still exists.

Better, lower-cost visualization tools are in increasing demand as sales and communications tools. Data and database functions (versus graphics functions) are increasing in importance in AEC design systems, creating opportunities to sell users significant new functionality. Some vendors will create products that foster communication in the entire design, construction, and maintenance process. These products will increase the payoff in CAD investments.

The European AEC software market reached $375 million in software revenue in 1994. Based on ECU, AEC software revenue in Europe increased by 13 percent. This growth was driven by the top 10 vendors' 19 percent aggregate growth. These top 10 vendors, seven of which are European companies, control 72 percent of this market segment (see Table 4-3). In the AEC segment, European vendors keep gaining market share and now control 60 percent of the market; U.S.-based vendors control the rest in terms of software revenue. This compares with a 58 percent share for European vendors in 1993 and 55 percent in 1992.

Table 4-3
Top 10 AEC Software Vendors' Size and Growth

Company	1994 ($M)	Growth (%)	1993 Ranking
Autodesk	65.4	15.6	1
Nemetschek	58.1	30.1	2
Intergraph	40.8	6.6	3
IEZ	36.2	30.1	4
IBM	16.7	15.5	5
RIB/Bausoftware	15.7	46.8	7
Soft-Tech	13.3	16.8	6
ZIEGLER Informatics	8.3	244.3	25
Han Dataport	8.2	26.6	9
Graphisoft Group	7.8	62.7	13
Top 10 Companies	270.5	20.7	
All Companies	375.0	15.0	
Top 10 Companies (ECU)	228.2	18.7	
All Companies (ECU)	316.4	13.2	

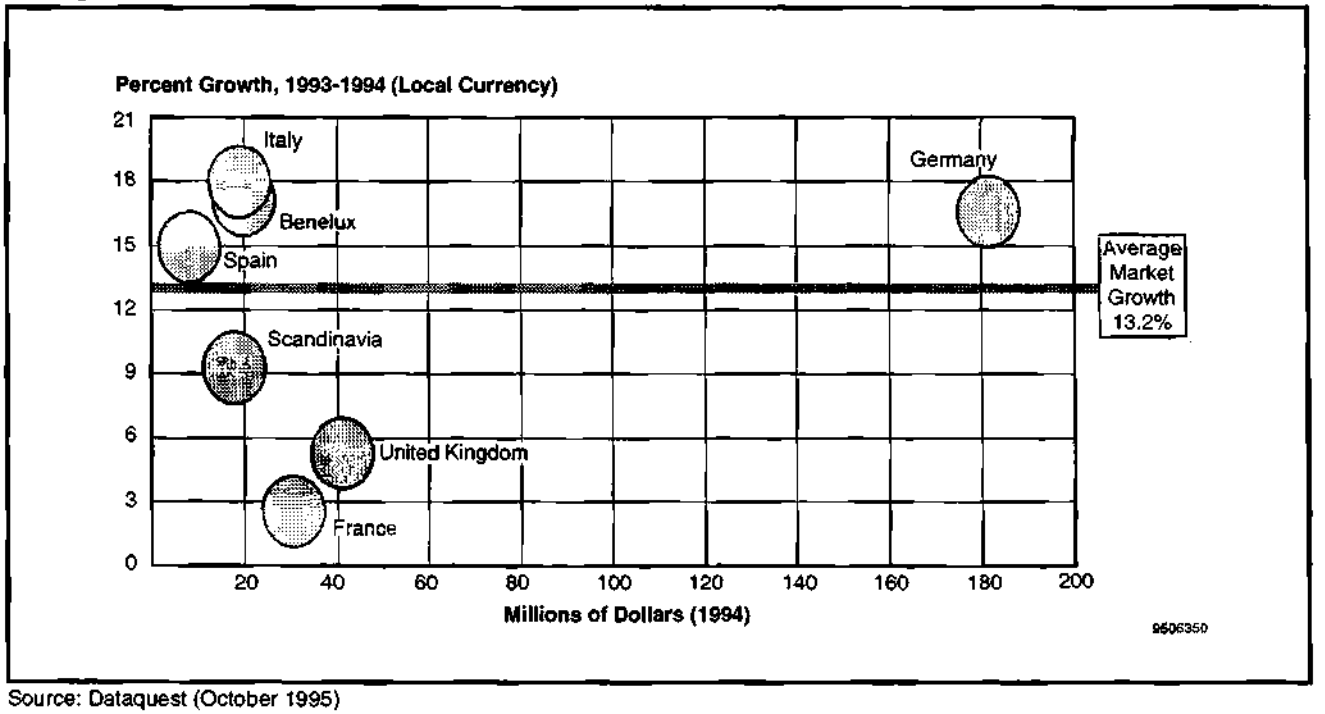
Source: Dataquest (October 1995)

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The largest regional market for AEC software is Germany, which absolutely dominates this market segment in Europe with a 49 percent share of the total European AEC software revenue (see Figures 4-12 and 4-13). Contrary to the other technical applications, among the top 10 European AEC software vendors, seven are European companies (see Table 4-3). This can partly be attributed to the fact most architects started using CAD tools later than other industry sectors. By then—especially in Germany—already a large number of local software houses were already specializing in this sector. Moreover, the AEC sector consists of many small businesses or one-man bands that require more individual support. Obviously, a local supplier can satisfy this need much better than a foreign supplier. Moreover, a local vendor is more able to customize his product to the local design regulations and attitudes.

The AEC market segment is dominated by PC-based solutions, not only in terms of unit shipments, which accounted for 86 percent of all seats shipped in Europe in 1994, but also in terms of software revenue, which accounted for 53 percent of the total European AEC software revenue (see Figure 4-14).

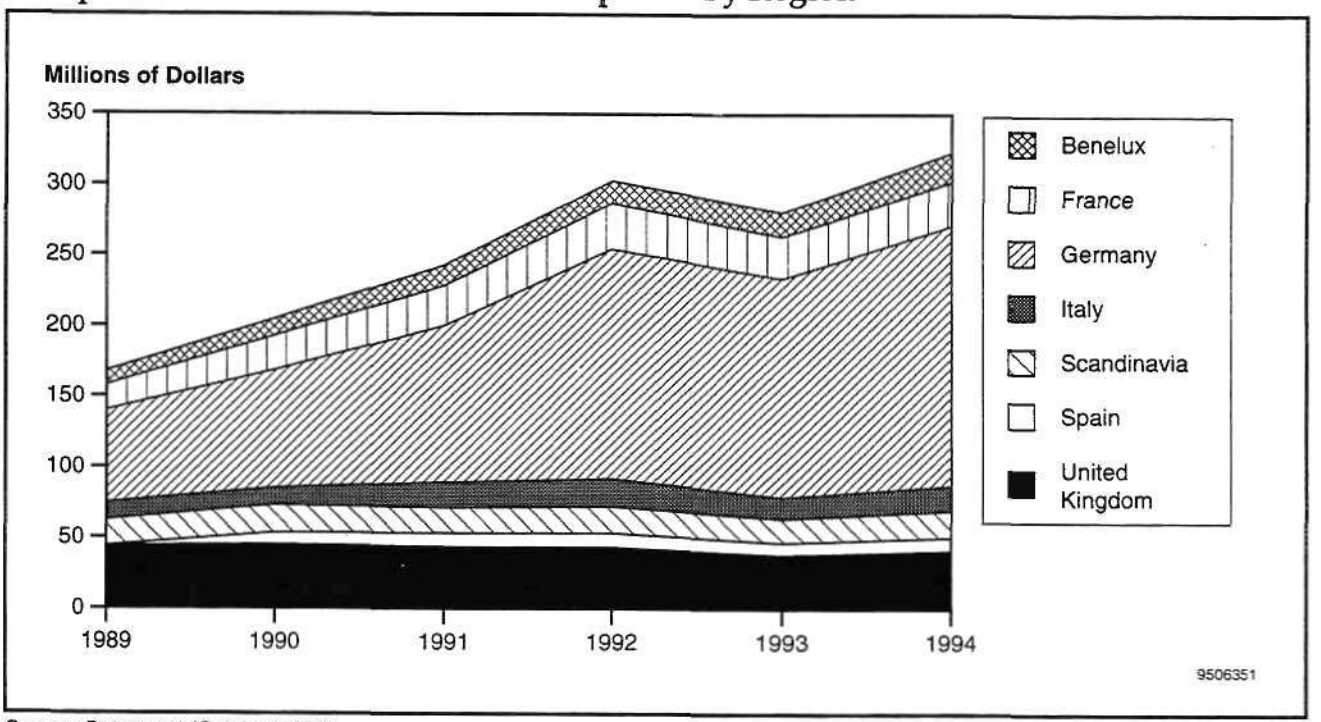
Figure 4-12
European AEC Software Market Portfolio



Source: Dataquest (October 1995)

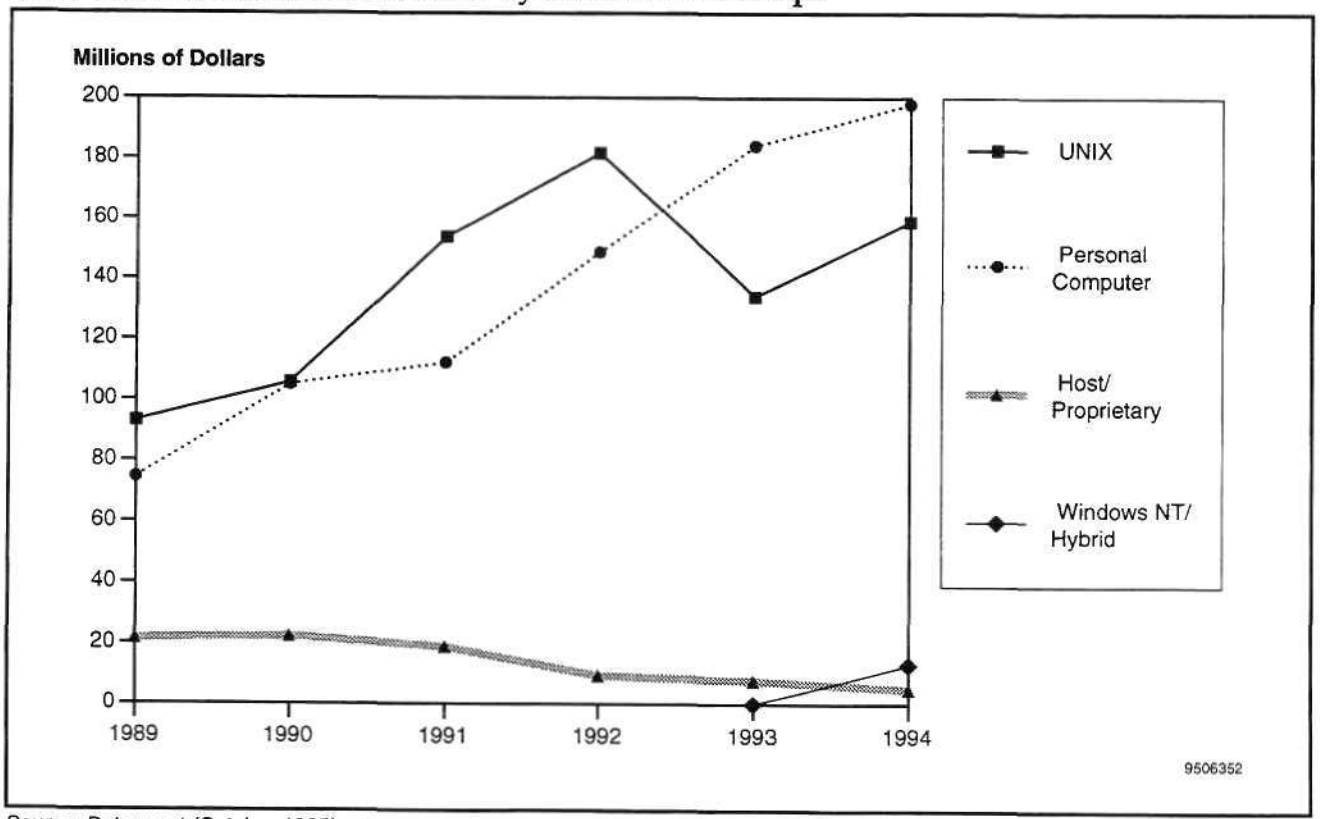
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Figure 4-13
European AEC Software Market Development by Region



Source: Dataquest (October 1995)

Figure 4-14
AEC Software Revenue Forecast by Platform in Europe



Source: Dataquest (October 1995)

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A similar initiative to AIT in the discrete manufacturing industry was established in 1995 for the European process industry. The Process Industries Manufacturing Advantage through IT (PRIMA) project aims to set up a network of process industries companies in Europe to establish the mid- and long-term requirements for IT (including standards) of the industries using continuous or batch processes for manufacturing or for the provision of services. The project will establish a dialogue between these process sectors, the IT vendors, and the relevant European R&D programs. Its output will be a description of how key business requirements for the future can be translated into projects and systems using the mechanisms of EU R&D programs.

GIS

There is a tendency around Europe to make the public sector smaller. In countries where, for example, the utility sector was privatized, we have seen a surge in GIS spending almost as a direct result. Also, the telecommunications sector is becoming increasingly deregulated, and in order for telecommunications companies to have a competitive edge, they have had to become more efficient in managing territories. This trend has resulted in large orders for GIS from German Telekom and France Telecom, among others.

In Europe, GIS software revenue in 1994 increased 12 percent based on the ECU, reaching $284 million in revenue. Germany is again the largest region in terms of software revenue size, but its lead in this market is not as large as in the other applications (see Figure 4-15). In this market sector, the United Kingdom plays a major role, both in the use of GIS and in GIS software development. The United Kingdom's position in this sector can be attributed to the fact that although prices for digital map data are among the highest in Europe, the Ordnance Survey in the United Kingdom has been aggressive in developing very detailed and reliable data. The top 10 vendors, which control 74 percent of this market segment, increased their software revenue by 13 percent in aggregate (see Table 4-4). European vendors held a 47 percent share of the European GIS software market in 1992; in 1994, U.S.-based vendors held 57 percent of the market despite the fact there are five European vendors among the top 10 (see Figure 4-16).

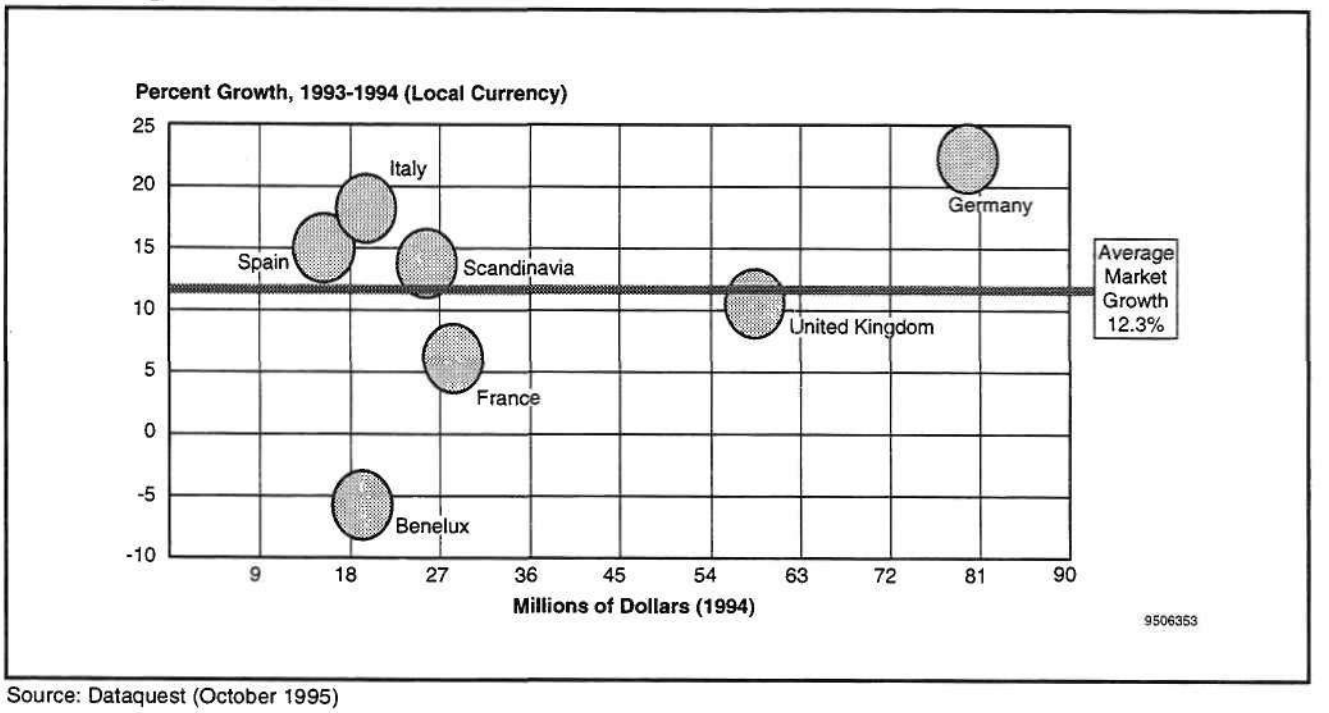
In terms of software revenue, the European GIS market is very much dominated by UNIX-based solutions. PC-based solutions are constantly gaining more ground, and host-based solutions have almost become extinct (see Figure 4-17).

All of this means there is plenty of scope for the European GIS market to exhibit strong growth over the next decades; however, some projects in Europe are stuck because of nonavailability of data. Cadastral and utility applications need high-precision data that in some cases does not exist and where it does exist, the cost of good topological data is prohibitive.

There are some European initiatives to address the data problems. One is the EC's IMPACT initiative that tries to encourage cross-border development of new geographical information sources aimed at strategic business applications. The European Umbrella Organization for Geographical Information (EUROGI) was formed to encourage various groups within the European geographic information community to start working together. It will consider topics such as standards in GIS, cost-benefit studies, teaching, and training.

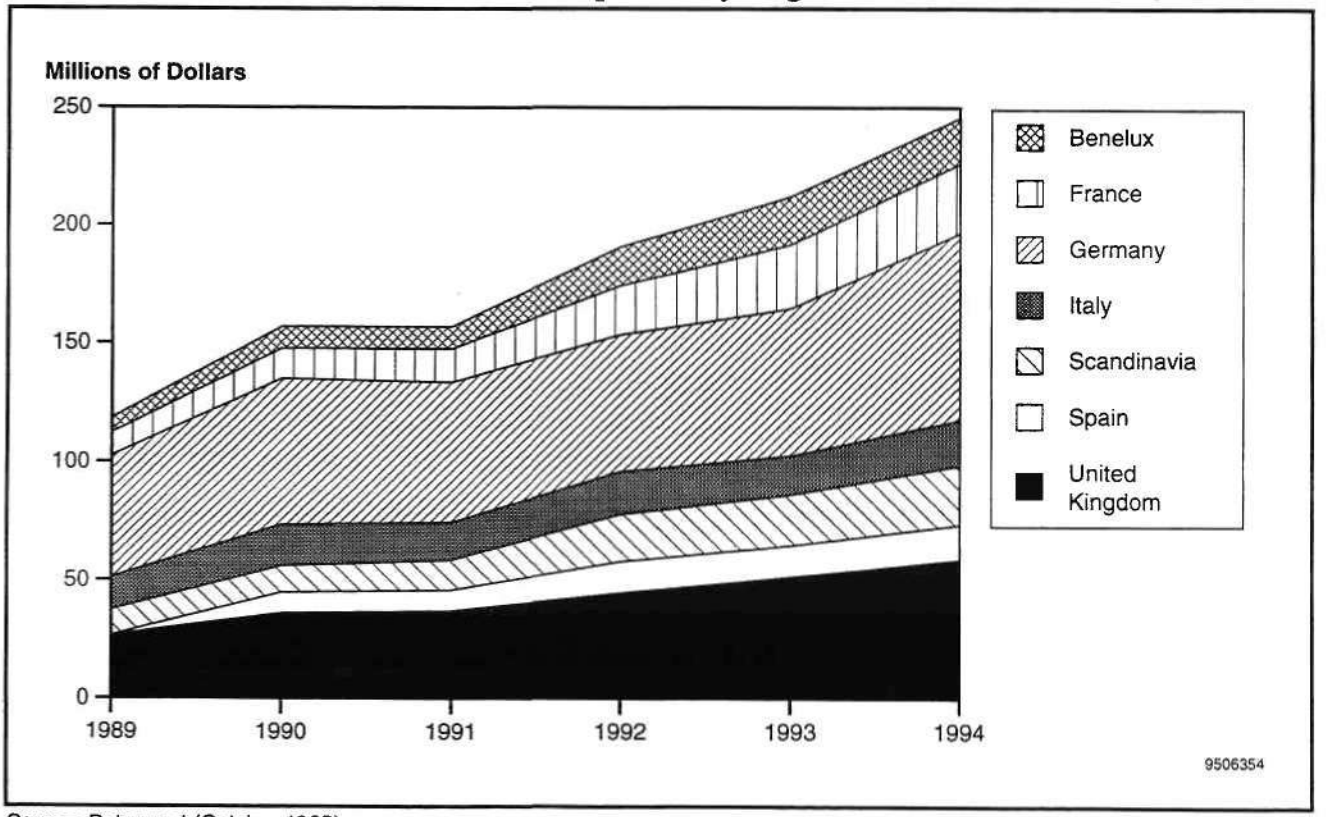
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Figure 4-15
1994 European GIS Software Market Portfolio



Source: Dataquest (October 1995)

Figure 4-16
European GIS Software Market Development by Region



Source: Dataquest (October 1995)

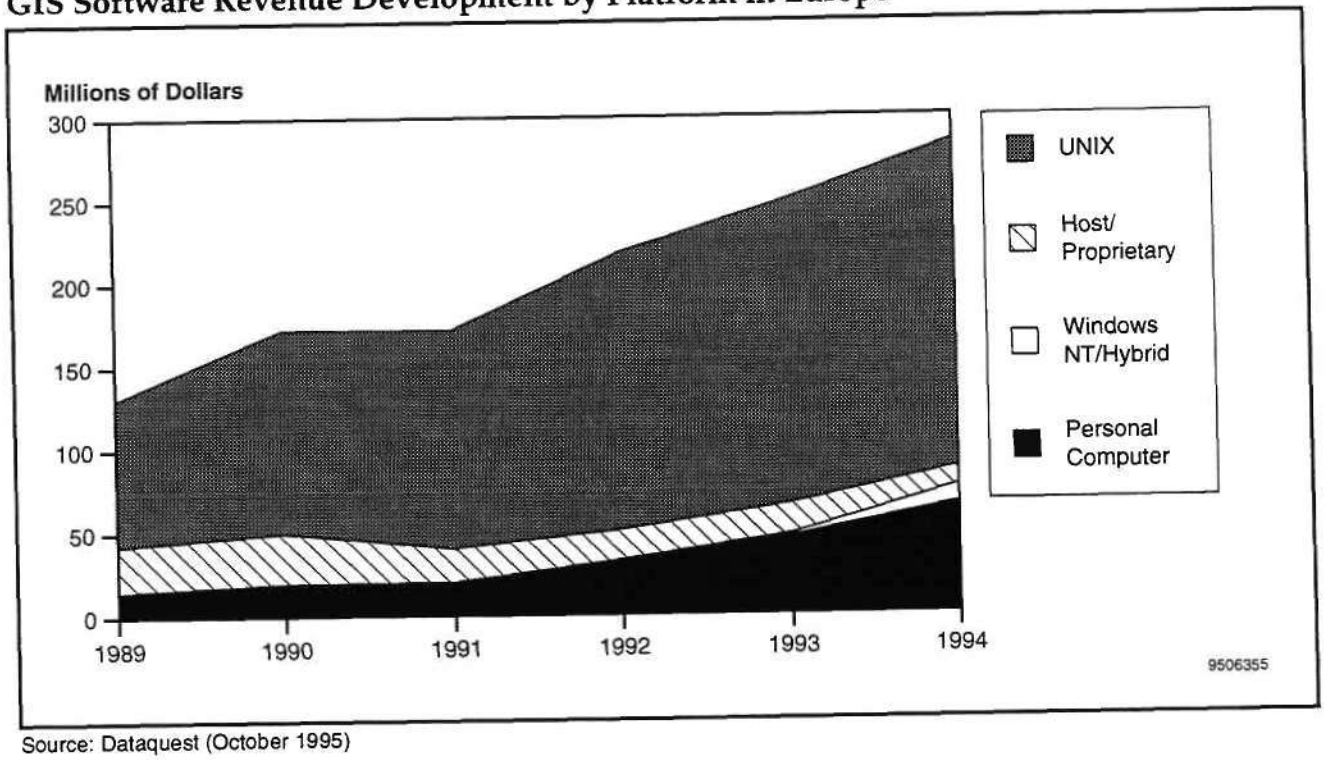
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Table 4-4
Top 10 GIS Software Vendors' Size and Growth

Company	1994 ($M)	Growth (%)	1993 Ranking
Siemens Nixdorf	49.6	3.1	1
ESRI	48.4	34.7	3
Intergraph	41.6	9.4	2
Smallworld Systems	18.7	35.9	5
Autodesk	16.6	15.0	4
Sysdeco	8.8	5.5	7
ICL	8.7	-3.1	6
strässle Informationssysteme	7.4	13.3	8
APIC Systémes	4.9	21.7	11
UNISYS	4.7	33.1	13
Top 10 Companies	209.4	14.5	
All Companies	283.7	14.1	
Top 10 Companies (ECU)	176.7	12.8	
All Companies (ECU)	239.3	12.3	

Source: Dataquest (October 1995)

Figure 4-17
GIS Software Revenue Development by Platform in Europe



Source: Dataquest (October 1995)

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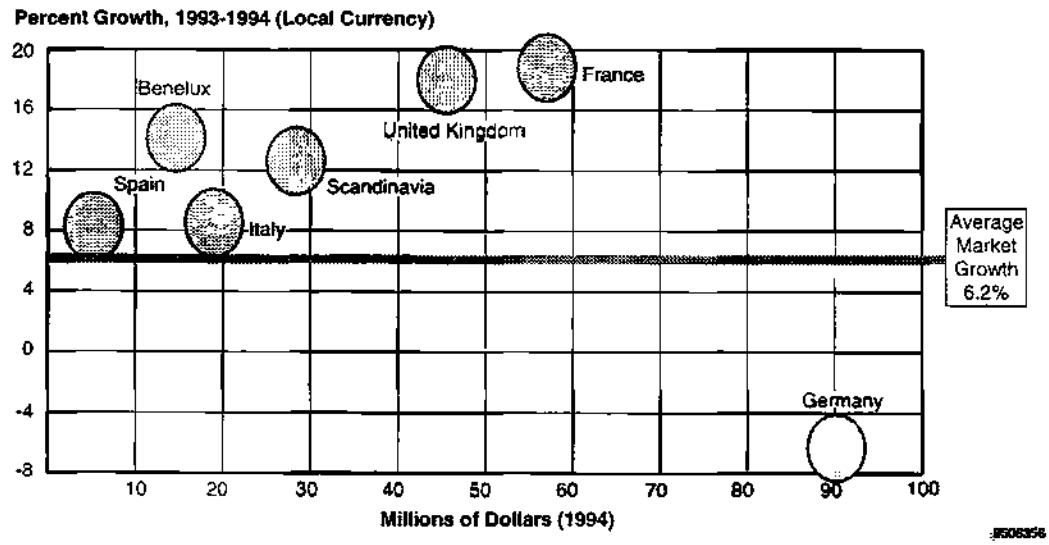
The European end-user market is fragmented and differs by country depending on the level of privatization of government sectors and how the various sectors are structured. In several of the countries, such as Belgium, the public authority is responsible for roads and wastewater but not for utilities such as gas, electricity, and drinking water. Because there is usually no coordination between the public authority and the utility sector in countries where these sectors are independent of each other, it is impossible to create a single good database. In most cases, these two sectors do not share costs for political reasons.

EDA

The European EDA software market showed better growth in 1994. Overall EDA software revenue growth in Europe was 6.2 percent based on ECU. In U.S. dollars, the market reached $281 million. Figure 4-18 shows the size of the country markets in millions of dollars: Germany, as with the other technical applications discussed in this report, is by far the biggest market. However, the margin of Germany's lead is much smaller. Since 1990, Germany's share of the EDA market has been decreasing whereas France and the United Kingdom have gained market share.

This improved growth for EDA software in Europe can be attributed to an overall improvement in the European economy and the fact many user companies that deferred investments during the years of recession are replacing outdated systems.

Figure 4-18
1994 European EDA Software Market Portfolio



Source: Dataquest (October 1995)

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The top 10 vendors had a 64 percent share of the total EDA software market. The positions of these vendors changed significantly in 1994 compared with 1993 (see Table 4-5). When compared with the other application sectors, these top 10 vendors had a lower growth rate—5 percent in ECU—than the average EDA software growth rate. The EDA market is heavily dominated by U.S.-based vendors that held an 80 percent share of the overall European EDA software market in 1994. In 1992, this share was 77 percent. U.S.-based vendors have been steadily increasing their hold on the European EDA market, and now that Racal-Redac has become a Japanese company, the European vendors' share plunged even further in 1994. Other acquisitions of European vendors include Cadis by Synopsys and Anacad by Mentor Graphics. See Figure 4-19 for EDA software development by region.

The EDA market, more than any other segment of the European CAD/CAM/CAE/GIS software industry, is dominated by UNIX-based solutions. See Figure 4-20 for the EDA market development by platform in Europe.

As in other industries, a lot of equipment is produced in Europe but is not necessarily designed in Europe. Much of it is produced by Japanese or North American companies that tend to design their products at their home bases. Major differences therefore exist between what is produced and what is designed in Europe. In particular, telecommunications, which is third in production, is way ahead when it comes to design investment. The main investment in EDA software revenue in Europe during 1994

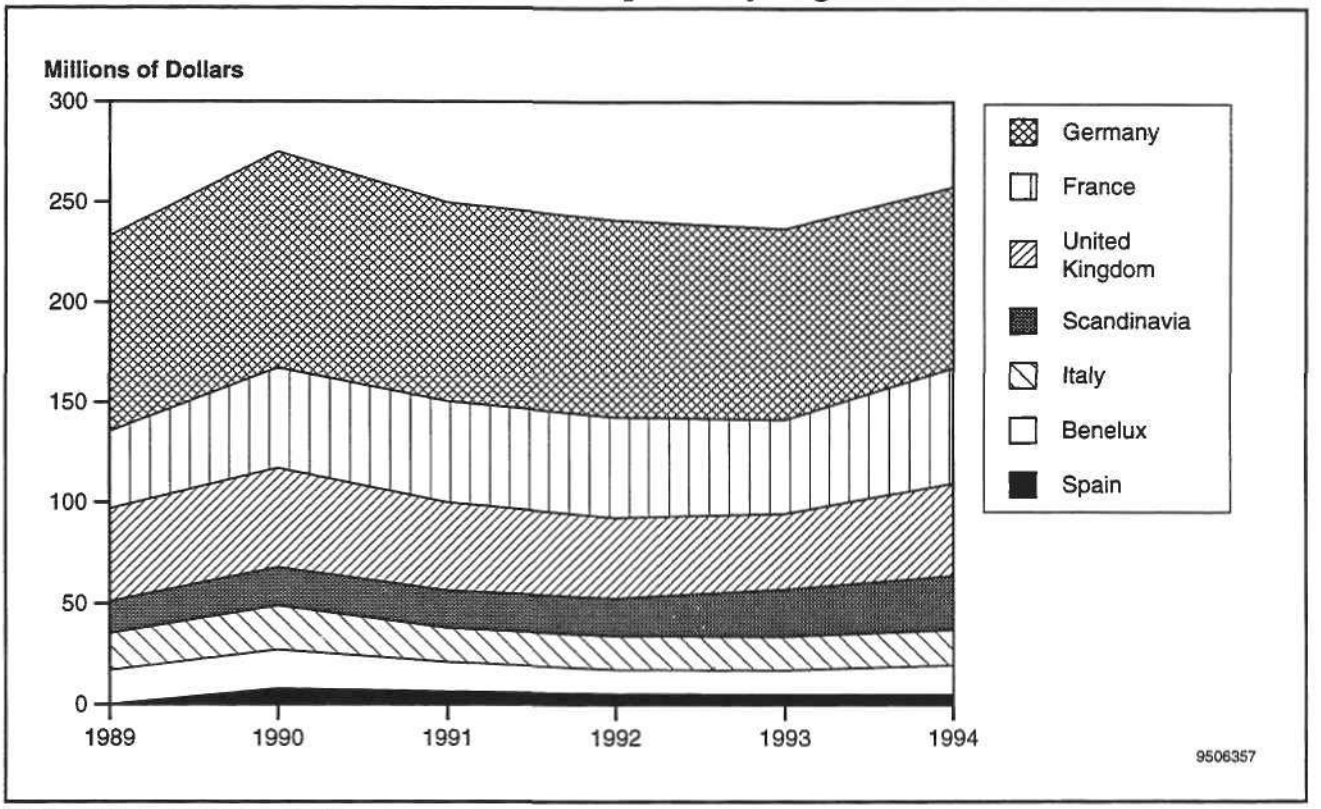
Table 4-5
Top 10 EDA Software Vendors Size and Growth

Company	1994 ($M)	Growth (%)	1993 Ranking
Mentor Graphics	42.0	20.9	2
Cadence	40.3	6.9	1
Synopsys	20.0	-24.8	3
Viewlogic Systems	18.7	31.2	4
Quickturn Design Systems	11.8	165.0	13
COMPASS Design Automation	11.3	-3.0	6
Zuken-Redac	10.3	-23.2	5
Hewlett-Packard	9.6	7.9	7
Autodesk	7.8	-1.2	8
Zycad	6.8	58.5	14
Top 10 Companies	178.6	6.2	
All Companies	281.1	7.8	
Top 10 Companies (ECU)	150.7	4.6	
All Companies (ECU)	237.1	6.2	

Source: Dataquest (October 1995)

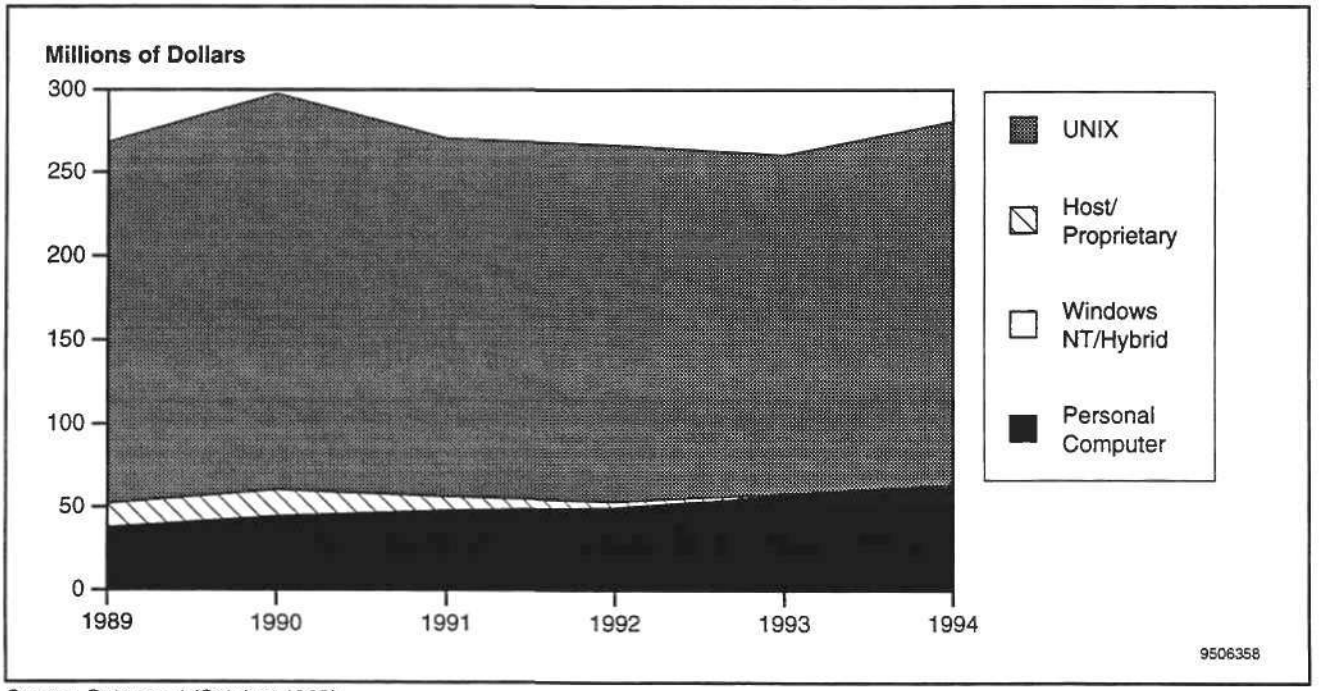
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Figure 4-19
European EDA Software Revenue Development by Region



Source: Dataquest (October 1995)

Figure 4-20
EDA Software Revenue Forecast by Platform in Europe

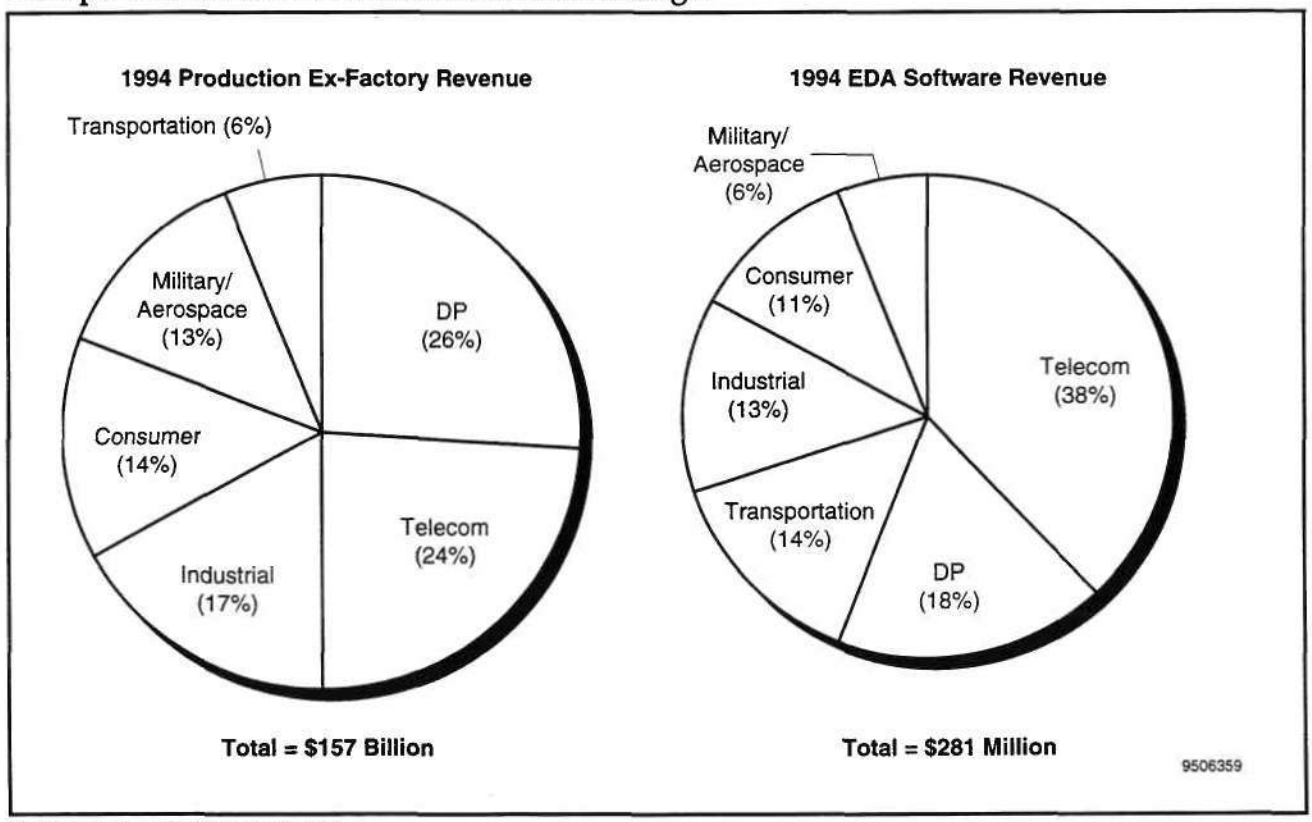


Source: Dataquest (October 1995)

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came from the telecommunications sector, which continues to dominate electronic design in Europe. Thirty-eight percent of the EDA software generated in Europe came from the telecommunications sector (see Figure 4-21). Of the top 13 worldwide telecommunications companies, eight are headquartered in Europe, including the top two. In addition to this sector, the semiconductor and defense industries in Europe increased their investment in EDA software tools.

Figure 4-21
European Electronics Production versus Design



Source: Dataquest (October 1995)

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Appendix A
European CAD/CAM/CAE/GIS Market Statistics

Table A-1
1994 CAD/CAM/CAE/GIS Total Vendor Market Share Update (Millions of U.S. Dollars) Top 30 Revenue and Shipments Vendors, Europe, All Operating Systems, All Applications

Rank	Company Name	CPU Shipments (Units)	Software Revenue	CPU Revenue	Service Revenue	Total Factory Revenue	1994 Share of Market (%)
1	IBM	34,760	184.8	545.9	182.3	968.9	17.1
2	Hewlett-Packard	27,632	46.9	484.7	112.2	643.8	11.4
3	Digital Equipment	40,161	-	510.8	77.3	588.1	10.4
4	Sun Microsystems	22,843	-	373.6	72.7	446.2	7.9
5	Intergraph	11,924	109.1	107.7	102.5	343.3	6.1
6	Computervision	-	98.0	-	133.0	231.0	4.1
7	Siemens Nixdorf Informations-systeme	4,863	83.0	58.8	58.8	206.4	3.6
8	Silicon Graphics	4,721	-	140.5	19.3	159.8	2.8
9	Autodesk	-	149.9	-	-	149.9	2.6
10	Matra Datavision	2,254	63.4	32.9	10.3	113.4	2.0
11	Nemetschek	2,295	58.1	21.4	8.0	92.1	1.6
12	Parametric Technology	-	69.7	-	19.7	89.4	1.6
13	Mentor Graphics	174	42.0	5.0	37.8	84.8	1.5
14	EDS Unigraphics	1,276	44.9	18.1	16.6	79.6	1.4
15	Cadence	-	40.8	-	34.3	75.1	1.3
16	IEZ	1,187	36.2	16.8	11.1	66.8	1.2
17	ESRI	-	48.4	-	9.1	57.5	1.0
18	Landmark Graphics	171	23.2	4.9	20.8	53.2	0.9
19	SDRC	-	27.8	-	14.0	41.9	0.7
20	ASCAD	537	12.1	15.8	3.8	37.2	0.7
21	MacNeal-Schwendler	-	30.1	-	6.9	37.0	0.7
22	strässle Informationssysteme	240	23.3	3.2	7.7	34.4	0.6
23	Wiechers Datentechnik	548	21.5	6.0	6.1	33.7	0.6
24	ICL	1,020	12.1	18.9	2.6	33.6	0.6
25	Applicon	364	14.2	5.9	9.2	33.2	0.6
26	Sysdeco Innovation	307	8.8	8.5	9.1	32.1	0.6
27	Synopsys	-	20.0	-	9.4	29.4	0.5
28	Smallworld Systems	43	18.7	0.6	8.8	28.3	0.5
29	Han Dataport	346	17.7	5.0	3.9	28.3	0.5
30	RIB/Bausoftware	125	20.7	2.1	3.1	26.3	0.5
	Other Companies	116,272	-	326.7	6.0	419.0	7.4
	All North American Companies	118,517	1,153.6	1,817.3	938.4	4,000.4	70.6
	All European Companies	23,421	660.3	280.7	220.4	1,220.3	21.6
	All Asian Companies	228	10.3	4.3	7.2	22.6	0.4
	All Companies	258,438	1,824.2	2,429.0	1,171.9	5,662.4	100.0

Note: Because vendor data includes OEM revenue and shipments, the sum of vendors is greater than the total.
Source: Dataquest (August 1995)

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Table A-2
1994 CAD/CAM/CAE/GIS Total Vendor Market Share Update (Millions of U.S. Dollars)
Top 30 Revenue and Shipments Vendors, Europe, UNIX, All Applications

Rank	Company Name	CPU Shipments (Units)	Software Revenue	CPU Revenue	Service Revenue	Total Factory Revenue	1994 Share of Market (%)
1	IBM	13,381	133.2	404.6	132.9	703.1	18.0
2	Hewlett-Packard	18,896	43.5	454.2	108.8	606.4	15.5
3	Sun Microsystems	22,843	-	373.6	72.7	446.2	11.4
4	Digital Equipment	9,500	-	195.6	33.6	229.2	5.9
5	Computervision	-	93.1	-	133.0	226.1	5.8
6	Siemens Nixdorf Informations-systeme	2,129	63.2	45.7	52.1	164.3	4.2
7	Intergraph	2,026	55.8	41.6	53.7	163.3	4.2
8	Silicon Graphics	4,721	-	140.5	19.3	159.8	4.1
9	Matra Datavision	2,022	62.0	32.1	10.3	111.2	2.8
10	Mentor Graphics	174	41.1	5.0	37.8	83.9	2.1
11	Parametric Technology	-	62.7	-	17.7	80.4	2.1
12	EDS Unigraphics	1,276	44.9	18.1	16.6	79.6	2.0
13	Cadence	-	40.8	-	34.3	75.1	1.9
14	IEZ	1,187	34.3	16.8	11.0	64.8	1.7
15	Landmark Graphics	171	23.2	4.9	20.8	53.2	1.4
16	ESRI	-	33.6	-	8.4	42.0	1.1
17	SDRC	-	27.8	-	14.0	41.9	1.1
18	Nemetschek	725	26.2	9.6	3.6	41.5	1.1
19	ASCAD	514	11.5	15.6	3.7	36.1	0.9
20	strässle Informationssysteme	240	23.3	3.2	7.7	34.4	0.9
21	ICL	1,020	12.1	18.9	2.6	33.6	0.9
22	Applicon	364	13.7	5.9	9.2	32.7	0.8
23	Sysdeco Innovation	307	8.8	8.5	9.1	32.1	0.8
24	Synopsys	-	20.0	-	9.4	29.4	0.8
25	Smallworld Systems	43	18.7	0.6	8.8	28.3	0.7
26	Han Dataport	346	17.7	5.0	3.9	28.3	0.7
27	MacNeal-Schwendler	-	20.6	-	4.7	25.3	0.6
28	Zuken-Redac	228	10.1	4.3	7.0	22.2	0.6
29	PROCAD GmbH	152	13.6	2.8	5.0	21.6	0.6
30	Delcam International	301	5.6	7.7	5.5	20.0	0.5
	All North American Companies	58,726	803.0	1,384.2	780.2	3,022.4	77.4
	All European Companies	12,308	427.1	219.4	177.2	860.5	22.0
	All Asian Companies	228	10.1	4.3	7.0	22.2	0.6
	All Companies	71,262	1,240.1	1,607.8	964.3	3,905.1	100.0

Note: Because vendor data includes OEM revenue and shipments, the sum of vendors is greater than the total.
Source: Dataquest (August 1995)

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Table A-3
1994 CAD/CAM/CAE/GIS Total Vendor Market Share Update (Millions of U.S. Dollars)
Top Revenue and Shipments Vendors, Europe, Windows NT/Hybrid, All Applications

Rank	Company Name	CPU Shipments (Units)	Software Revenue	CPU Revenue	Service Revenue	Total Factory Revenue	1994 Share of Market (%)
1	Intergraph	1,725	24.3	22.8	21.3	73.0	73.7
2	Parametric Technology	-	7.0	-	2.0	8.9	9.0
3	Digital Equipment	358	-	4.5	1.3	5.7	5.8
4	Hewlett-Packard	283	-	2.8	0.3	3.1	3.2
5	ESRI	-	2.2	-	0.1	2.3	2.3
6	PROCAD GmbH	20	1.5	0.2	0.3	2.0	2.0
7	IEZ	-	1.9	-	0.1	2.0	2.0
8	SPATIAL Technology	-	0.6	-	0.1	0.7	0.7
9	Rasna Corporation	-	0.3	-	0.1	0.4	0.4
10	Mentor Graphics	-	0.3	-	-	0.3	0.3
11	EA Systems	-	0.1	-	0.1	0.2	0.2
12	CAD Distribution	-	0.2	-	0	0.2	0.2
13	PCI Remote Sensing Corporation	-	0.1	-	-	0.1	0.1
14	Intusoft	-	0.1	-	-	0.1	0.1
15	PADS Software	-	0.1	-	0	0.1	0.1
16	Autometric	1	0	0	0	0.1	0.1
17	InterHDL	-	0	-	-	0	0
	Other Companies	28	-	0.3	-	0.3	0.3
	All North American Companies	2,367	34.4	30.1	25.4	94.4	95.4
	All European Companies	20	3.6	0.2	0.4	4.2	4.3
	All Asian Companies	-	-	-			-
	All Companies	2,414	38.0	30.6	25.8	99.0	100.0

Note: Because vendor data includes OEM revenue and shipments, the sum of vendors is greater than the total.
Source: Dataquest (August 1995)

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Table A-4
1994 CAD/CAM/CAE/GIS Total Vendor Market Share Update (Millions of U.S. Dollars)
Top 30 Revenue and Shipments Vendors, Europe, Personal Computer, All Applications

Rank	Company Name	CPU Shipments (Units)	Software Revenue	CPU Revenue	Service Revenue	Total Factory Revenue	1994 Share of Market (%)
1	Autodesk	-	140.9	-	-	140.9	12.4
2	Intergraph	8,172	29.0	43.3	20.7	100.3	8.8
3	IBM	21,107	8.1	76.0	0.4	84.5	7.4
4	Digital Equipment	27,487	-	81.3	2.9	84.2	7.4
5	Nemetschek	1,570	32.0	11.7	4.4	50.7	4.5
6	Hewlett-Packard	8,452	3.4	27.7	3.1	34.2	3.0
7	Siemens Nixdorf Informations-systeme	2,558	14.8	9.1	1.0	26.0	2.3
8	Investronica SA	806	6.2	6.2	2.5	22.7	2.0
9	Wiechers Datentechnik	433	14.5	4.4	3.3	22.2	2.0
10	Soft-Tech Software Technologies	1,156	13.3	-	1.6	17.0	1.5
11	Ziegler Informatics	-	16.6	-	-	16.6	1.5
12	RIB/Bausoftware	-	15.0	-	1.3	16.3	1.4
13	Tebis	126	5.7	1.7	3.5	12.0	1.1
14	Viewlogic Systems	-	11.9	-	-	11.9	1.0
15	ESRI	-	10.4	-	0.5	10.9	1.0
16	Hochtief	125	4.4	1.7	3.1	9.2	0.8
17	CAD Distribution	-	8.2	-	0.9	9.1	0.8
18	Ground Modelling Systems	891	3.7	2.8	0.6	9.0	0.8
19	Serbi	640	6.8	2.0	-	8.8	0.8
20	Graphisoft Group	163	7.9	0.5	0.1	8.6	0.8
21	RoboCAD Solutions	-	6.3	-	1.9	8.2	0.7
22	ACA Ltd.	-	6.4	-	1.6	8.1	0.7
23	CAD Lab	256	4.2	1.7	2.0	7.8	0.7
24	Norlinvest Ltd.	41	7.1	0.1	0.2	7.4	0.7
25	Technische Computer Systeme	180	4.5	1.0	0.3	5.8	0.5
26	Cimatron	278	3.2	1.4	0.5	5.6	0.5
27	Computervision	-	4.9	-	-	4.9	0.4
28	mb Programme	95	2.3	1.5	0.9	4.9	0.4
29	Aucotec	168	2.2	1.0	1.2	4.7	0.4
30	Computer Services Consultants	-	4.4	-	-	4.4	0.4
	Other Companies	116,126	-	303.4	-	303.4	26.7
	All North American Companies	55,588	256.7	203.1	33.5	500.7	44.1
	All European Companies	10,846	221.2	55.2	35.5	331.4	29.2
	All Asian Companies	-	0.2	-	0.2	0.4	0
	All Companies	182,560	478.1	561.7	69.2	1,135.8	100.0

Note: Because vendor data includes OEM revenue and shipments, the sum of vendors is greater than the total.
Source: Dataquest (August 1995)

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Table A-5
1994 CAD/CAM/CAE/GIS Total Vendor Market Share Update (Millions of U.S. Dollars)
Top Revenue and Shipments Vendors, Europe, Host/Proprietary, All Applications

Rank	Company Name	CPU Shipments (Units)	Software Revenue	CPU Revenue	Service Revenue	Total Factory Revenue	1994 Share of Market (%)
1	Digital Equipment	2,816	-	229.5	39.5	269.0	51.5
2	IBM	271	43.5	65.3	49.0	181.3	34.7
3	Siemens Nixdorf Informations-systeme	176	5.0	4.0	5.7	16.2	3.1
4	MacNeal-Schwendler	-	9.5	-	2.3	11.8	2.3
5	Intergraph	-	-	-	6.7	6.7	1.3
6	Exapt	70	2.0	1.7	1.0	5.9	1.1
7	GDS	40	2.5	1.4	0.8	5.3	1.0
8	ESRI	-	2.2	-	0.1	2.3	0.4
9	Ansys	-	0.8	-	0	0.9	0.2
10	Framasoft	-	0.4	-	0.4	0.8	0.2
11	Mechanical Dynamics	-	0.4	-	0.4	0.8	0.1
12	Aspen Technology	-	0.4	-	0.3	0.7	0.1
13	debis Systemhaus	1	0.4	0.1	0.1	0.5	0.1
14	Whessoe Computing Systems	-	0.4	-	-	0.4	0.1
15	Cimtel	1	0	0.1	0.2	0.3	0.1
16	Computational Mechanics	-	0.2	-	-	0.2	0
17	EA Systems	-	0.1	-	0.1	0.2	0
18	NOVASOFT Systems	-	0.1	-	0.1	0.1	0
19	Analogy	-	0.1	-	0	0.1	0
20	PCI Remote Sensing Corporation	-	0.1	-	-	0.1	0
21	Dynamic Graphics	-	0	-	0	0.1	0
22	GRAFTEK	1	0	0	0	0.1	0
23	Harris EDA	1	0.1	-	-	0.1	0
24	Assigraph	-	0	-	0	0	0
25	Meta-Software	-	0	-	0	0	0
26	Access Corporation	-	0	-	0	0	0
27	Rasna Corporation	-	0	-	0	0	0
28	Accugraph	-	0	-	0	0	0
	Other Companies	119	-	23.0	6.0	115.3	22.1
	All North American Companies	1,835	59.6	200.0	99.3	382.9	73.3
	All European Companies	248	8.4	5.9	7.3	24.2	4.6
	All Asian Companies	-	-	-			-
	All Companies	2,202	68.0	228.9	112.5	522.4	100.0

Note: Because vendor data includes OEM revenue and shipments, the sum of vendors is greater than the total.
Source: Dataquest (August 1995)

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Table A-6
1994 CAD/CAM/CAE/GIS Total Vendor Market Share Update (Millions of U.S. Dollars)
Top 30 Mechanical CAD/CAM/CAE Companies, Europe, All Operating Systems

Rank	Company Name	CPU Shipments (Units)	Software Revenue	CPU Revenue	Service Revenue	Total Factory Revenue	1994 Share of Market (%)
1	IBM	18,252	163.3	367.2	155.3	735.4	24.8
2	Digital Equipment	25,983	-	369.1	50.9	420.0	14.2
3	Hewlett-Packard	14,315	37.3	283.4	71.9	392.6	13.2
4	Computervision	-	91.4	-	123.6	215.0	7.3
5	Sun Microsystems	8,136	-	137.4	19.8	157.2	5.3
6	Silicon Graphics	3,510	-	105.6	14.5	120.1	4.1
7	Matra Datavision	2,254	63.4	32.9	10.3	113.4	3.8
8	Parametric Technology	-	69.7	-	19.7	89.4	3.0
9	EDS Unigraphics	1,276	44.9	18.1	16.6	79.6	2.7
10	Intergraph	1,577	21.2	16.2	20.8	62.0	2.1
11	Autodesk	-	60.1	-	-	60.1	2.0
12	Siemens Nixdorf Informations-systeme	1,290	24.2	17.1	17.3	60.0	2.0
13	SDRC	-	27.8	-	14.0	41.9	1.4
14	ASCAD	537	12.1	15.8	3.8	37.2	1.3
15	MacNeal-Schwendler	-	27.7	-	6.3	34.0	1.1
16	Applicon	364	14.2	5.9	9.2	33.2	1.1
17	CAD Lab	539	12.9	7.0	6.2	26.1	0.9
18	strässle Informationssysteme	164	15.8	2.2	5.5	23.8	0.8
19	Investronica SA	806	6.2	6.2	2.5	22.7	0.8
20	PROCAD GmbH	164	14.3	2.9	5.0	22.4	0.8
21	ISD Software	349	13.2	4.3	3.4	21.7	0.7
22	Delcam International	339	5.9	7.9	5.5	20.6	0.7
23	ICEM Technologies	272	6.2	5.7	5.6	17.9	0.6
24	Radan Computational	321	8.1	4.2	2.5	15.4	0.5
25	Wiechers Datentechnik	255	8.9	2.7	2.2	13.8	0.5
26	Tebis	134	6.4	1.9	3.9	13.3	0.5
27	Cimatron	444	5.4	4.2	1.1	11.4	0.4
28	Han Dataport	138	7.1	2.0	1.6	11.3	0.4
29	Sherpa Corporation	-	6.8	-	4.5	11.3	0.4
30	ICL	274	3.2	5.1	0.7	9.0	0.3
	Other Companies	30,809	-	99.4	4.9	176.0	5.9
	All North American Companies	57,281	619.4	1,040.6	547.0	2,265.0	76.4
	All European Companies	9,704	265.0	134.4	92.4	522.4	17.6
	All Asian Companies	-	-	-			-
	All Companies	97,794	884.4	1,274.4	644.4	2,963.4	100.0

Note: Because vendor data includes OEM revenue and shipments, the sum of vendors is greater than the total.
Source: Dataquest (August 1995)

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Table A-7
1994 CAD/CAM/CAE/GIS Total Vendor Market Share Update (Millions of U.S. Dollars)
Top 30 AEC CAD Companies, Europe, All Operating Systems

Rank	Company Name	CPU Shipments (Units)	Software Revenue	CPU Revenue	Service Revenue	Total Factory Revenue	1994 Share of Market (%)
1	IBM	9,436	16.7	89.7	18.0	129.4	13.4
2	Intergraph	5,138	40.8	40.3	37.9	127.4	13.2
3	Nemetschek	2,295	58.1	21.4	8.0	92.1	9.6
4	IEZ	1,187	36.2	16.8	11.1	66.8	6.9
5	Autodesk	-	65.4	-	-	65.4	6.8
6	Hewlett-Packard	4,242	-	47.2	6.8	54.0	5.6
7	Digital Equipment	6,715	-	37.5	4.0	41.5	4.3
8	Sun Microsystems	1,855	-	27.1	1.8	28.9	3.0
9	Siemens Nixdorf Informations-systeme	442	8.3	5.9	5.9	20.6	2.1
10	RIB/Bausoftware	99	16.1	1.6	2.4	20.5	2.1
11	Soft-Tech Software Technologies	1,156	13.3	-	1.6	17.0	1.8
12	Han Dataport	208	10.6	3.0	2.3	17.0	1.8
13	Computervision	-	6.3	-	7.7	14.0	1.5
14	Silicon Graphics	361	-	9.7	1.2	10.9	1.1
15	Hochtief	125	4.4	1.7	3.1	9.2	1.0
16	CAD Centre	15	7.5	0.5	1.0	9.0	0.9
17	Technische Computer Systeme	168	6.3	1.5	0.9	8.7	0.9
18	Graphisoft Group	160	7.8	0.5	0.1	8.4	0.9
19	Ziegler Informatics	-	8.3	-	-	8.3	0.9
20	ACA Ltd.	-	6.5	-	1.6	8.1	0.8
21	MOSS Systems Group	28	3.7	0.5	3.6	7.9	0.8
22	M.O.C.	94	1.9	3.2	0.9	6.7	0.7
23	Complansoft CAD	166	3.4	2.5	-	6.6	0.7
24	mb Programme	95	2.3	1.5	0.9	4.9	0.5
25	Star Informatic	102	3.0	0.8	0.6	4.5	0.5
26	Ground Modelling Systems	477	1.8	1.5	0.2	4.5	0.5
27	Kockums Computer Systems	381	1.6	1.9	1.0	4.5	0.5
28	Triplan	70	2.3	1.7	0.5	4.5	0.5
29	Computer Services Consultants	-	4.4	-	-	4.4	0.5
30	CAD Distribution	-	3.9	-	0.4	4.3	0.5
	Other Companies	57,295	-	150.3	0.1	152.0	15.8
	All North American Companies	23,064	149.3	203.2	82.9	449.4	46.7
	All European Companies	7,795	225.7	70.8	49.0	361.0	37.5
	All Asian Companies	-	-	-			-
	All Companies	88,153	375.0	424.3	131.9	962.5	100.0

Note: Because vendor data includes OEM revenue and shipments, the sum of vendors is greater than the total.
Source: Dataquest (August 1995)

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Table A-8
1994 CAD/CAM/CAE/GIS Total Vendor Market Share Update (Millions of U.S. Dollars)
Top 30 GIS Companies, Europe, All Operating Systems

Rank	Company Name	CPU Shipments (Units)	Software Revenue	CPU Revenue	Service Revenue	Total Factory Revenue	1994 Share of Market (%)
1	Intergraph	5,069	41.6	49.1	40.5	142.5	17.6
2	Siemens Nixdorf Informations-systeme	3,080	49.6	35.2	34.8	123.5	15.3
3	Digital Equipment	5,756	-	74.6	15.3	89.9	11.1
4	ESRI	-	48.4	-	9.1	57.5	7.1
5	Landmark Graphics	171	23.2	4.9	20.8	53.2	6.6
6	IBM	2,559	3.0	40.7	5.8	50.9	6.3
7	Hewlett-Packard	2,902	-	43.4	6.8	50.2	6.2
8	Sun Microsystems	1,884	-	34.6	7.0	41.5	5.1
9	Sysdeco Innovation	307	8.8	8.5	9.1	32.1	4.0
10	Smallworld Systems	43	18.7	0.6	8.8	28.3	3.5
11	ICL	733	8.7	13.6	1.8	24.2	3.0
12	Autodesk	-	16.6	-	-	16.6	2.1
13	UNISYS	130	4.7	2.1	5.0	12.4	1.5
14	strässle Informationssysteme	76	7.4	1.0	2.2	10.6	1.3
15	Laser-Scan	60	4.4	1.6	2.5	9.4	1.2
16	Genasys II	74	4.6	1.3	1.5	7.7	1.0
17	APIC Systemes	-	4.9	-	1.8	6.7	0.8
18	Star Informatic	91	4.3	1.0	1.1	6.7	0.8
19	Poppenhaeger Grips	105	2.7	2.4	0.9	6.2	0.8
20	GDS	61	3.2	1.4	0.9	5.9	0.7
21	RIB/Bausoftware	25	4.6	0.4	0.7	5.8	0.7
22	SHL VISION Solutions	7	3.6	0.2	1.9	5.7	0.7
23	Silicon Graphics	156	-	4.9	0.7	5.6	0.7
24	Ground Modelling Systems	414	1.9	1.3	0.4	4.4	0.5
25	MapInfo	-	3.6	-	0.4	4.0	0.5
26	Clemessy Geocity	28	1.0	0.8	1.2	3.1	0.4
27	Geometria GIS Systems House	20	0.2	0.2	2.4	2.8	0.3
28	PAFEC	40	1.5	0.9	0.4	2.8	0.3
29	Ziegler Informatics	-	2.7	-	-	2.7	0.3
30	PCI Remote Sensing Corporation	-	2.1	-	-	2.1	0.3
	Other Companies	10,016	-	27.6	0.4	33.4	4.1
	All North American Companies	15,547	160.7	207.4	117.5	504.1	62.3
	All European Companies	5,066	123.0	68.0	68.7	271.9	33.6
	All Asian Companies	-	-	-			-
	All Companies	30,628	283.7	303.1	186.5	809.5	100.0

Note: Because vendor data includes OEM revenue and shipments, the sum of vendors is greater than the total.
Source: Dataquest (August 1995)

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Table A-9
1994 CAD/CAM/CAE/GIS Total Vendor Market Share Update (Millions of U.S. Dollars)
Top 30 EDA Companies, Europe, All Operating Systems, EDA

Rank	Company Name	CPU Shipments (Units)	Software Revenue	CPU Revenue	Service Revenue	Total Factory Revenue	1994 Share of Market (%)
1	Sun Microsystems	10,968	-	174.6	44.1	218.6	23.6
2	Hewlett-Packard	6,173	9.6	110.8	26.7	147.1	15.9
3	Mentor Graphics	174	42.0	5.0	37.8	84.8	9.1
4	Cadence	-	40.8	-	34.3	75.1	8.1
5	IBM	4,512	1.7	48.3	3.2	53.3	5.8
6	Digital Equipment	1,707	-	29.6	7.1	36.7	4.0
7	Synopsys	-	20.0	-	9.4	29.4	3.2
8	Viewlogic Systems	-	20.5	-	3.8	24.3	2.6
9	Silicon Graphics	694	-	20.3	2.9	23.2	2.5
10	Zuken-Redac	228	10.3	4.3	7.2	22.6	2.4
11	Wiechers Datentechnik	268	11.5	3.1	3.5	18.2	2.0
12	COMPASS Design Automation	-	11.4	-	2.6	14.1	1.5
13	Quickturn Design Systems	-	11.8	-	1.3	13.1	1.4
14	Intergraph	141	5.5	2.1	3.4	11.5	1.2
15	Harris EDA	61	6.5	0.8	3.0	10.3	1.1
16	Zycad	-	6.8	-	1.8	8.6	0.9
17	Autodesk	-	7.8	-	-	7.8	0.8
18	Norlinvest Ltd.	41	7.1	0.1	0.2	7.4	0.8
19	Aucotec	209	3.4	1.3	2.0	7.0	0.8
20	Sagantec	-	5.6	-	0.6	6.1	0.7
21	Analogy	-	4.6	-	1.0	5.6	0.6
22	LSI Logic	-	3.5	0.2	0.6	4.4	0.5
23	ALTERA	-	3.4	-	0.6	4.0	0.4
24	debis Systemhaus	13	2.6	0.4	0.4	3.5	0.4
25	VEDA	-	1.9	-	1.3	3.2	0.3
26	MacNeal-Schwendler	-	2.4	-	0.6	3.0	0.3
27	IKOS Systems	30	2.4	-	0.6	3.0	0.3
28	ALS Design	21	2.3	0.2	0.2	2.8	0.3
29	Microsim	-	2.6	-	0.1	2.8	0.3
30	XILINX	-	2.2	-	0.5	2.7	0.3
	Other Companies	18,152	-	49.4	0.5	57.5	6.2
	All North American Companies	22,625	224.2	366.1	191.0	781.9	84.3
	All European Companies	857	46.6	7.5	10.4	65.0	7.0
	All Asian Companies	228	10.3	4.3	7.2	22.6	2.4
	All Companies	41,862	281.1	427.2	209.1	927.1	100.0

Note: Because vendor data includes OEM revenue and shipments, the sum of vendors is greater than the total.
Source: Dataquest (August 1995)

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Table A-10
1994 CAD/CAM/CAE/GIS Total Vendor Market Share Update (Millions of U.S. Dollars)
Top 15 CAD/CAM/CAE/GIS Companies, Benelux, All Operating Systems

Rank	Company Name	CPU Shipments (Units)	Software Revenue	CPU Revenue	Service Revenue	Total Factory Revenue	1994 Share of Market (%)
1	Digital Equipment	4,233	-	53.5	8.3	61.8	20.1
2	IBM	1,584	7.2	23.7	7.2	40.3	13.1
3	Hewlett-Packard	1,819	0.7	32.2	6.7	39.6	12.9
4	Intergraph	999	9.0	8.8	8.4	28.1	9.2
5	Sun Microsystems	838	-	13.7	2.7	16.4	5.3
6	EDS Unigraphics	255	9.0	3.6	3.3	15.9	5.2
7	Silicon Graphics	378	-	11.2	1.5	12.8	4.2
8	Autodesk	-	12.0	-	-	12.0	3.9
9	Parametric Technology	-	7.2	-	2.0	9.3	3.0
10	Siemens Nixdorf Informations-systeme	165	2.7	1.9	1.9	6.8	2.2
11	Star Informatic	97	3.5	0.9	0.8	5.4	1.7
12	ESRI	-	3.9	-	0.7	4.6	1.5
13	IEZ	80	2.5	1.1	0.8	4.5	1.5
14	Hochtief	44	1.5	0.6	1.1	3.2	1.0
15	Synopsys	-	1.4	-	0.7	2.1	0.7
	Other Companies	6,165	21.7	19.8	9.4	56.4	18.4
	All North American Companies	8,011	63.0	116.8	47.4	231.6	75.5
	All European Companies	695	23.1	8.3	8.6	41.8	13.6
	All Asian Companies	15	0.7	0.3	0.5	1.5	0.5
	All Companies	14,699	94.2	142.4	59.3	306.8	100.0

Note: Because vendor data includes OEM revenue and shipments, the sum of vendors is greater than the total.
Source: Dataquest (August 1995)

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Table A-11
1994 CAD/CAM/CAE/GIS Total Vendor Market Share Update (Millions of U.S. Dollars)
Top 15 CAD/CAM/CAE/GIS Companies, France, All Operating Systems

Rank	Company Name	CPU Shipments (Units)	Software Revenue	CPU Revenue	Service Revenue	Total Factory Revenue	1994 Share of Market (%)
1	IBM	4,723	37.5	84.1	35.4	168.4	19.9
2	Digital Equipment	6,260	-	79.6	11.7	91.3	10.8
3	Sun Microsystems	4,344	-	71.9	14.4	86.3	10.2
4	Hewlett-Packard	3,190	5.3	56.7	13.2	75.1	8.9
5	Matra Datavision	1,234	34.7	18.0	5.7	62.1	7.4
6	Computervision	-	23.3	-	31.3	54.6	6.5
7	Intergraph	1,842	16.3	17.1	15.4	52.6	6.2
8	Silicon Graphics	850	-	25.3	3.5	28.8	3.4
9	Autodesk	-	22.5	-	-	22.5	2.7
10	Parametric Technology	-	15.9	-	4.5	20.4	2.4
11	Cadence	-	9.4	-	7.9	17.3	2.0
12	Mentor Graphics	32	7.6	0.9	6.9	15.4	1.8
13	Serbi	640	6.8	2.0	-	8.8	1.0
14	EDS Unigraphics	137	4.8	2.0	1.8	8.6	1.0
15	SDRC	-	5.3	-	2.6	7.9	0.9
	Other Companies	13,708	67.6	44.8	24.1	151.1	17.9
	All North American Companies	17,401	184.0	278.8	159.1	637.8	75.5
	All European Companies	2,537	70.6	28.4	16.3	120.5	14.3
	All Asian Companies	30	1.4	0.6	1.0	3.0	0.4
	All Companies	33,300	277.6	347.2	185.8	845.0	100.0

Note: Because vendor data includes OEM revenue and shipments, the sum of vendors is greater than the total.
Source: Dataquest (August 1995)

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Table A-12
1994 CAD/CAM/CAE/GIS Total Vendor Market Share Update (Millions of U.S. Dollars)
Top 15 CAD/CAM/CAE/GIS Companies, Germany, All Operating Systems

Rank	Company Name	CPU Shipments (Units)	Software Revenue	CPU Revenue	Service Revenue	Total Factory Revenue	1994 Share of Market (%)
1	IBM	14,142	79.0	224.0	77.6	404.6	19.3
2	Hewlett-Packard	10,604	28.4	186.2	46.4	261.0	12.5
3	Digital Equipment	10,985	-	139.3	20.3	159.6	7.6
4	Sun Microsystems	7,478	-	120.7	24.4	145.1	6.9
5	Siemens Nixdorf Informations-systeme	3,265	57.0	40.3	40.5	141.6	6.8
6	Intergraph	2,768	26.7	24.5	24.9	81.5	3.9
7	Nemetschek	1,974	50.0	18.4	6.9	79.2	3.8
8	Computervision	-	22.8	-	31.3	54.1	2.6
9	Autodesk	-	42.0	-	-	42.0	2.0
10	IEZ	699	21.3	9.9	6.5	39.3	1.9
11	Silicon Graphics	1,039	-	30.9	4.2	35.1	1.7
12	ASCAD	500	11.3	14.7	3.5	34.6	1.7
13	strässle Informationssysteme	211	20.5	2.8	6.5	29.9	1.4
14	Matra Datavision	563	15.8	8.2	2.6	28.4	1.4
15	Mentor Graphics	51	12.2	1.5	11.0	24.6	1.2
	Other Companies	48,742	199.9	159.7	72.6	479.3	22.9
	All North American Companies	39,976	310.6	620.4	281.5	1,244.3	59.4
	All European Companies	11,136	332.4	140.0	109.3	608.4	29.1
	All Asian Companies	91	4.1	1.7	2.9	9.0	0.4
	All Companies	97,671	685.0	895.7	412.5	2,093.9	100.0

Note: Because vendor data includes OEM revenue and shipments, the sum of vendors is greater than the total.
Source: Dataquest (August 1995)

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Table A-13
1994 CAD/CAM/CAE/GIS Total Vendor Market Share Update (Millions of U.S. Dollars)
Top 15 CAD/CAM/CAE/GIS Companies, Italy, All Operating Systems

Rank	Company Name	CPU Shipments (Units)	Software Revenue	CPU Revenue	Service Revenue	Total Factory Revenue	1994 Share of Market (%)
1	IBM	3,324	15.7	51.3	15.7	87.4	20.0
2	Digital Equipment	4,289	-	54.3	8.4	62.7	14.4
3	Hewlett-Packard	2,648	3.7	46.8	10.7	61.1	14.0
4	Sun Microsystems	1,897	-	31.4	5.9	37.2	8.5
5	CAD Lab	496	11.9	6.5	5.7	24.0	5.5
6	Computervision	-	9.7	-	13.0	22.6	5.2
7	Intergraph	486	4.6	4.5	4.4	14.4	3.3
8	Autodesk	-	13.5	-	-	13.5	3.1
9	Siemens Nixdorf Informations-systeme	310	5.1	3.6	3.6	12.6	2.9
10	Silicon Graphics	330	-	9.8	1.4	11.2	2.6
11	Matra Datavision	188	5.3	2.7	0.9	9.5	2.2
12	ESRI	-	6.8	-	1.3	8.1	1.8
13	Parametric Technology	-	5.9	-	1.7	7.5	1.7
14	Cadence	-	3.3	-	2.7	6.0	1.4
15	IEZ	92	2.8	1.3	0.9	5.2	1.2
	Other Companies	7,829	48.3	30.8	21.8	110.9	25.4
	All North American Companies	10,394	78.5	160.4	72.1	317.0	72.7
	All European Companies	1,950	39.6	20.1	15.2	78.6	18.0
	All Asian Companies	15	0.7	0.3	0.5	1.5	0.3
	All Companies	19,169	128.1	200.4	92.2	436.2	100.0

Note: Because vendor data includes OEM revenue and shipments, the sum of vendors is greater than the total.
Source: Dataquest (August 1995)

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Table A-14
1994 CAD/CAM/CAE/GIS Total Vendor Market Share Update (Millions of U.S. Dollars)
Top 15 CAD/CAM/CAE/GIS Companies, Scandanavia, All Operating Systems

Rank	Company Name	CPU Shipments (Units)	Software Revenue	CPU Revenue	Service Revenue	Total Factory Revenue	1994 Share of Market (%)
1	IBM	2,708	14.2	42.6	14.1	75.2	20.5
2	Digital Equipment	3,765	-	47.4	7.0	54.4	14.8
3	Intergraph	1,615	14.4	14.5	13.6	45.7	12.5
4	Hewlett-Packard	1,846	0.7	32.6	6.8	40.1	10.9
5	Sun Microsystems	1,241	-	20.3	3.7	24.0	6.6
6	Mentor Graphics	33	8.0	1.0	7.2	16.1	4.4
7	Autodesk	-	13.5	-	-	13.5	3.7
8	Computervision	-	4.2	-	5.5	9.7	2.7
9	Silicon Graphics	236	-	7.0	1.0	8.0	2.2
10	Parametric Technology	-	6.1	-	1.7	7.9	2.1
11	ESRI	-	5.8	-	1.1	6.9	1.9
12	Cadence	-	3.1	-	2.6	5.6	1.5
13	Sysdeco Innovation	59	1.6	1.8	1.8	5.5	1.5
14	Siemens Nixdorf Informations-systeme	103	1.7	1.2	1.2	4.1	1.1
15	SDRC	-	2.3	-	1.2	3.5	1.0
	Other Companies	6,641	27.6	20.8	9.9	63.4	17.3
	All North American Companies	9,371	87.5	135.2	70.5	300.9	82.1
	All European Companies	466	14.0	6.1	5.5	27.2	7.4
	All Asian Companies	15	0.7	0.3	0.5	1.5	0.4
	All Companies	16,291	112.3	160.0	80.6	366.4	100.0

Note: Because vendor data includes OEM revenue and shipments, the sum of vendors is greater than the total.
Source: Dataquest (August 1995)

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Table A-15
1994 CAD/CAM/CAE/GIS Total Vendor Market Share Update (Millions of U.S. Dollars)
Top 15 CAD/CAM/CAM/GIS Companies, Spain, All Operating Systems

Rank	Company Name	CPU Shipments (Units)	Software Revenue	CPU Revenue	Service Revenue	Total Factory Revenue	1994 Share of Market (%)
1	Hewlett-Packard	1,695	0.5	30.1	6.2	36.9	21.4
2	IBM	1,069	4.0	15.4	4.2	24.8	14.4
3	Intergraph	674	6.2	6.2	5.8	19.6	11.4
4	Sun Microsystems	652	-	10.6	1.6	12.2	7.1
5	Digital Equipment	722	-	9.0	1.6	10.5	6.1
6	Siemens Nixdorf Informations-systeme	171	2.8	2.0	1.9	6.9	4.0
7	Computervision	-	2.7	-	3.6	6.3	3.7
8	Autodesk	-	6.0	-	-	6.0	3.5
9	Silicon Graphics	142	-	4.2	0.6	4.8	2.8
10	Softronics	269	3.0	0.3	-	3.7	2.2
11	ESRI	-	2.9	-	0.5	3.5	2.0
12	EDS Unigraphics	49	1.7	0.7	0.6	3.1	1.8
13	Parametric Technology	-	2.2	-	0.6	2.9	1.7
14	Genasys II	18	1.1	0.3	0.4	1.9	1.1
15	Investronica SA	56	0.4	0.4	0.3	1.7	1.0
	Other Companies	3,952	12.7	12.7	6.4	34.9	20.3
	All North American Companies	4,222	33.3	63.8	28.7	128.7	74.9
	All European Companies	684	12.8	4.8	4.9	24.1	14.0
	All Asian Companies	-	-	-			-
	All Companies	8,707	50.0	79.4	35.4	171.9	100.0

Note: Because vendor data includes OEM revenue and shipments, the sum of vendors is greater than the total.
Source: Dataquest (August 1995)

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Table A-16
1994 CAD/CAM/CAE/GIS Total Vendor Market Share Update (Millions of U.S. Dollars)
Top 15 CAD/CAM/CAE/GIS Companies, United Kingdom, All Operating Systems

Rank	Company Name	CPU Shipments (Units)	Software Revenue	CPU Revenue	Service Revenue	Total Factory Revenue	1994 Share of Market (%)
1	Digital Equipment	7,718	-	98.3	15.2	113.5	12.9
2	Sun Microsystems	4,630	-	76.2	14.4	90.6	10.3
3	IBM	4,143	13.6	57.5	14.4	89.4	10.1
4	Hewlett-Packard	3,209	6.6	55.4	13.1	75.1	8.5
5	Computervision	-	31.7	-	43.1	74.7	8.5
6	Intergraph	2,101	19.3	18.9	18.1	60.6	6.9
7	Silicon Graphics	944	-	28.1	3.9	32.0	3.6
8	ICL	829	9.9	15.4	2.1	27.3	3.1
9	Sysdeco Innovation	212	6.2	5.6	6.3	23.2	2.6
10	Autodesk	-	22.5	-	-	22.5	2.5
11	Parametric Technology	-	14.2	-	4.0	18.2	2.1
12	EDS Unigraphics	270	9.5	3.8	3.5	16.8	1.9
13	Radan Computational	333	8.4	4.3	2.6	16.0	1.8
14	Mentor Graphics	30	7.1	0.9	6.4	14.4	1.6
15	Cadence	-	7.1	-	6.0	13.1	1.5
	Other Companies	17,154	83.2	60.6	34.2	192.4	21.8
	All North American Companies	18,292	183.1	269.8	159.6	622.0	70.5
	All European Companies	3,272	80.1	44.4	30.5	166.4	18.9
	All Asian Companies	61	2.7	1.1	1.9	6.0	0.7
	All Companies	37,479	287.6	361.1	201.7	882.2	100.0

Note: Because vendor data includes OEM revenue and shipments, the sum of vendors is greater than the total.
Source: Dataquest (August 1995)

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Table A-17
1994 CAD/CAM/CAE/GIS Total Vendor Market Share Update (Millions of U.S. Dollars)
Top 15 CAD/CAM/CAE/GIS Companies, Rest of Europe, All Operating Systems

Rank	Company Name	CPU Shipments (Units)	Software Revenue	CPU Revenue	Service Revenue	Total Factory Revenue	1994 Share of Market (%)
1	Hewlett-Packard	1,824	0.5	30.1	6.0	36.6	11.9
2	Sun Microsystems	1,762	-	28.7	5.6	34.3	11.2
3	Silicon Graphics	614	-	18.3	2.5	20.8	6.8
4	IBM	1,032	2.0	14.2	2.4	19.1	6.2
5	Autodesk	-	18.0	-	-	18.0	5.9
6	IEZ	276	8.4	3.9	2.6	15.5	5.1
7	Siemens Nixdorf Informations-systeme	358	5.9	4.2	4.2	14.7	4.8
8	Intergraph	376	3.3	3.4	3.2	10.7	3.5
9	Applicon	69	2.7	1.1	1.8	6.3	2.1
10	Cadence	-	3.3	-	2.7	6.0	2.0
11	Parametric Technology	-	4.5	-	1.3	5.7	1.9
12	Digital Equipment	393	-	4.7	0.8	5.4	1.8
13	RIB/Bausoftware	25	4.2	0.4	0.6	5.4	1.7
14	MacNeal-Schwendler	-	3.5	-	0.9	4.4	1.4
15	Matra Datavision	80	2.3	1.2	0.4	4.1	1.3
	Other Companies	13,162	27.6	39.9	10.5	88.8	29.0
	All North American Companies	5,163	49.6	85.5	32.6	170.1	55.5
	All European Companies	1,729	46.8	16.9	16.2	84.7	27.6
	All Asian Companies	-	-	-			-
	All Companies	19,310	102.4	137.5	51.3	306.3	100.0

Note: Because vendor data includes OEM revenue and shipments, the sum of vendors is greater than the total.
Source: Dataquest (August 1995)

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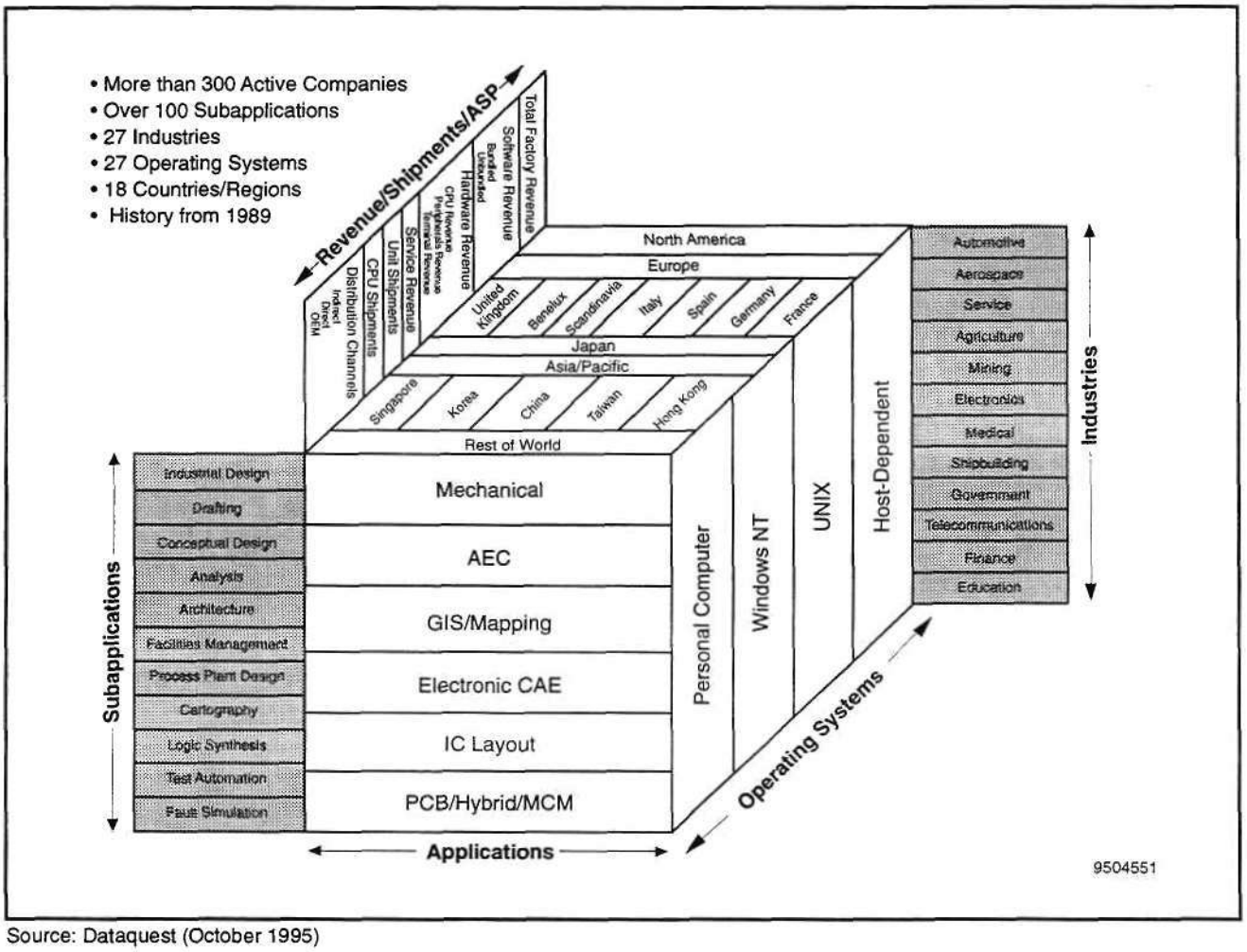
Appendix B
Methodology

To provide a comprehensive view of the CAD/CAM/CAE/GIS industry, Dataquest's CAD/CAM/CAE/GIS group maintains a large database of industry information. The type of information contained in the database is depicted in Figure B-1.

Market Share Methodology

Dataquest uses both primary and secondary sources to produce our market-share data. In the fourth quarter of each year and second quarter of the subsequent year, we survey all participants in each industry. Each vendor is offered the opportunity to report the information required. Although there is a primary contact for each company, large companies are surveyed across product lines and geographic regions. Thus, there is a corresponding increase in the number of contacts at large companies. (Dataquest maintains a large contact database on all sources of information.)

Figure B-1
CAD/CAM/CAE/GIS Market Database



Source: Dataquest (October 1995)

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Examples of the job titles of people contacted for information include the following:

- President and CEO
- Vice president and general manager
- Vice president of marketing
- Vice president, strategic product planning
- Director of strategic planning
- Director of marketing
- Director of market development
- Manager, CAD/CAM/CAE/GIS marketing programs
- Market research analyst

The Audit Process

Data supplied by vendors is evaluated against information drawn from many sources, including the following:

- Revenue published by major industry participants
- Estimates made by knowledgeable and reliable industry spokespersons
- Government or trade association data
- Published product literature and price lists
- Interviews with knowledgeable manufacturers, distributors, and users
- Relevant economic data
- Information and data from online data banks
- Articles in the general and trade presses
- Annual reports, SEC documents, and credit reports
- Company publications and press releases
- Reports from financial analysts
- User studies
- Reseller and supplier reports and reports from vendors' competitors

Dataquest also sums vendor revenue across other industries covered by Dataquest to make sure revenue is not credited twice. We also check with multiple sources at companies to cross-check data.

Dataquest analysts have many years of experience in applying the tools described to get the most accurate information possible on a particular company (such as what to use when and what industry averages are). We believe the estimates presented in this report are the most accurate and meaningful generally available today. It is the CAD/CAM/CAE/GIS group's policy to continually update its market information based on new data received, in order to arrive at the most accurate market representation possible.

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Dataquest's CAD/CAM/CAE/GIS market numbers are often higher than those reported by other sources. We survey worldwide, which involves more vendors, higher total market revenue, lower market share per vendor, and a more accurate market picture. This is particularly useful when comparing regions or applications.

Forecast Methodology

Fundamental to the way Dataquest conducts its research is the underlying philosophy that the best data and analyses come from a well-balanced program. This program includes the following: balance between primary and secondary collection techniques; balance between supply-side and demand-side analysis; balance between focused, industry-specific research and coordinated, big-picture analysis aided by integration of data from more than 25 separate high-technology industries Dataquest covers; and balance between the perspectives of experienced industry professionals and rigorous, disciplined techniques of seasoned market researchers.

Dataquest also analyzes trends in the macro environment that can have major influences on both supply-side and demand-side forecasting. In addition to demographics, analysts look at gross domestic product (GDP) growth, interest rate fluctuation, business expectations, and capital spending plans. In the geopolitical arena, the group looks at trade issues, political stability or lack thereof, tariffs, nontariff barriers, and such factors as the effect on Europe of the year's events.

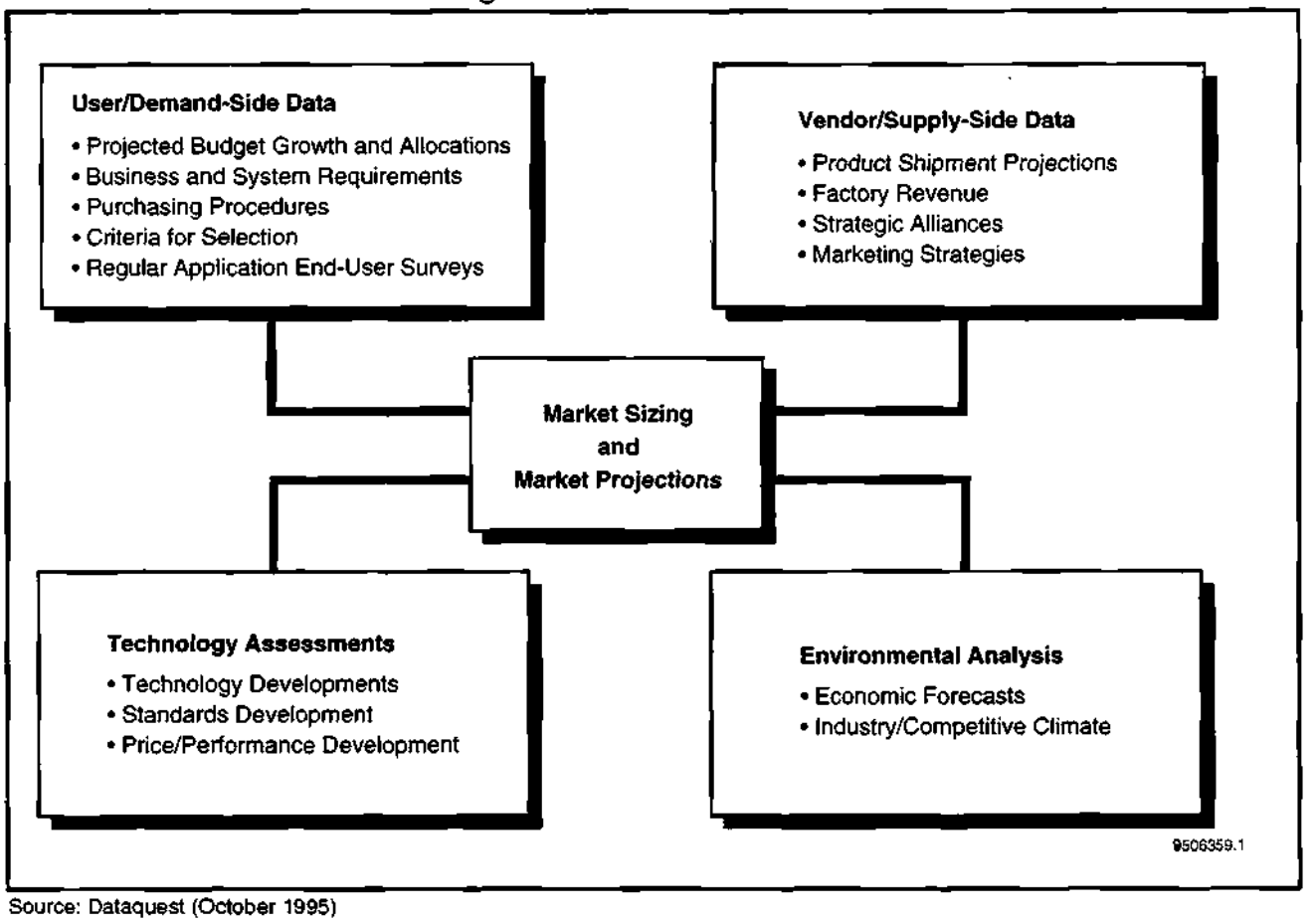
Figure B-2 shows the CAD/CAM/CAE/GIS forecasting model. The overall forecasting process uses a combination of forecasting techniques such as time series and technological modeling.

Market estimates and forecasts are derived using the following research techniques:

- Segment forecasting: Individual forecasts are derived for each application segment tracked by the CAD/CAM/CAE/GIS group. Specifically, each application, segmented by product, region, and platform, is forecast and rolled up. In this way, each application segment incorporates its own set of unique assumptions.
- Demand-based analysis: Market growth is tracked and forecast in terms of the present and anticipated demand of current and future users. This requires the development of a total available market model and a satisfied available market figure to assess the levels of penetration accurately. Dataquest analysts also factor in the acceptance or ability for users to consume new technology.
- Capacity-based analysis: This method involves identifying future shipment volume constraints. These constraints, or ceilings, can be the result of component availability, manufacturing capacity, or distribution capacity. In any case, capacity limitations are capable of keeping shipments below the demand level.

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Figure B-2
CAD/CAM/CAE/GIS Forecasting Model



Source: Dataquest (October 1995)

Segmentation Definitions

This section lists the definitions specific to this document. The following paragraphs define the segments.

Applications

Mechanical

The mechanical segment refers to computer-aided tools used by engineers, designers, analysts, technicians, and draftspeople working predominantly in the discrete manufacturing industries, but includes government and education. Users of mechanical CAD/CAM/CAE tools work in all departments across the typical organization, with a majority found in product design, advanced engineering, and manufacturing engineering. Common design applications include conceptual design, industrial design, structural or thermal analysis, detail design, and electromechanical design (the mechanical part of design with electrical or electronic components and mechanisms). Common manufacturing applications include tools and fixture design, numerical control part programming, offline robotics programming, and interface to quality-control systems. Management tools for database control and distribution are included in this segment, as well as user-defined application programming.

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Architecture, Engineering, and Construction (AEC)

The AEC segment covers the use of computer-aided tools by architects, contractors, plant engineers, civil engineers, and other people associated with these disciplines to aid in designing and managing buildings, industrial plants, ships, and other types of nondiscrete entities.

Geographic Information Systems/Mapping (GIS/Mapping)

GIS is computer-based technology, and the segment comprises of hardware, software, and data used to capture, edit, display, and analyze spatial (tagged by location) information.

Electronic Design Automation (EDA)

The EDA segment covers computer-based tools used to automate the process of designing an electronic product, including printed circuit boards, ICs, and systems. EDA includes ECAE, IC layout, and PCB/hybrid/MCM as follows:

- Electronic computer-aided engineering (ECAE): These are computer-aided tools used in the engineering or design phase of electronic products (as opposed to the physical layout phase of the product). Examples of ECAE applications are schematic capture and simulation.
- IC layout: This is a software application tool that is used to create and validate the physical implementation of an IC. The IC layout category comprises polygon editors, symbolic editors, placement and routing (gate array, cell, and block), design verification tools (DRC/ERC/logic-to-layout).
- PCB/hybrid/MCM: This segment covers products used to create the placement and routing of the traces and components laid out on a printed circuit board. Also included in this category are thermal analysis tools.

Regions

The regions covered in the service database are defined as follows:

North America

North America includes the United States, Mexico, and Canada.

Europe

Europe includes Benelux (Belgium, the Netherlands, and Luxembourg), France, Germany, Italy, Scandinavia (Denmark, Finland, Norway, and Sweden), Spain, the United Kingdom, and the Rest of Europe (Austria, Switzerland, and central and eastern Europe [including Russia and all other European countries/principalities]).

Japan

Asia/Pacific

Asia/Pacific includes China, Hong Kong, Korea, Singapore, and Taiwan.

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Rest of World

Rest of World comprises all other countries including Africa, Australia, Caribbean Islands, Central America, India, Middle East, New Zealand, and South America

Operating Systems

- Dataquest defines the operating systems as follows:
- UNIX: This includes all UNIX variants and older workstation operating systems.
- Host: Host includes minicomputer and mainframe operating systems in which the functions of external workstations are dependent on a host computer.
- Windows NT: Windows NT is the Microsoft operating system. We understand codes for Windows NT and Windows will be merged within three years. The probability is high that Microsoft will develop a client environment and a server environment. In our forecast, the future client environment is included in PC operating systems, and the future server environment is referenced as NT. Also included in NT is potential for an additional, new, high-end operating environment that could be developed by any vendor.
- PC: PC includes DOS, Windows, Windows 95, and Apple operating systems.

Metrics

The following paragraphs define measurements:

- Total factory revenue is defined as the amount of money received by a manufacturer for its goods and services measured in U.S. dollars. Total factory revenue does not include revenue a company may receive from products sold to another company for resale (OEM revenue). Total factory revenue is the sum of software revenue, hardware revenue, and service revenue.
- Unit shipment is defined as the number of seats delivered (number of possible simultaneous users of product delivered) excluding OEM shipments.
- Hardware revenue is revenue derived from sales of CPUs (including operating systems), terminals (for host-dependent systems), and peripherals.
- Software revenue is derived from the sale of application software that exists on a company's standard price list.
- Service revenue is defined as all revenue derived from the service and support of CAD/CAM/CAE/GIS systems. Service revenue can be calculated in the tables by subtracting hardware and software revenue from total revenue. A split by hardware service and software service is available through inquiry to clients of Dataquest's CAD/CAM/CAE/GIS service programs.
  - Maintenance fees are for hardware and software.

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- Management and operations services include help desk, education and training, disaster recovery, vaulting, and configuration management.
- Service bureau includes project work such as construction of database, data conversion, product design, analysis, or manufacturing.
- Application development includes design and development of customized software applications, the modification and/or enhancement of customization of existing software applications, and adding new functionality.
- Consulting revenue is the assessment of CAD/CAM/CAE/GIS business and information technology needs as well as the formulation of a plan based on needs identification.
- Implementation and integration services are the planning, implementation, migration, and integration of software products (software network support and integration, account integration management, data center design, and construction).

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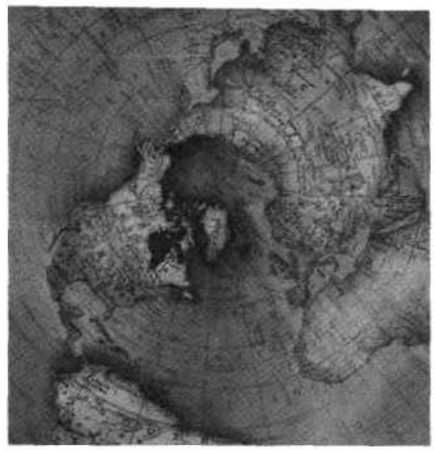
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1994 CAD/CAM/CAE/GIS Italy Market Share Update

Market Statistics

Program: CAD/CAM/CAE/GIS Europe
Product Code: CCAM-EU-MS-9507
Publication Date: September 25, 1995
Filing: Market Analysis

1994 CAD/CAM/CAE/GIS Italy Market Share Update



Market Statistics

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Note: All tables show estimated data.

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1994 CAD/CAM/CAE/GIS Italy Market Share Update

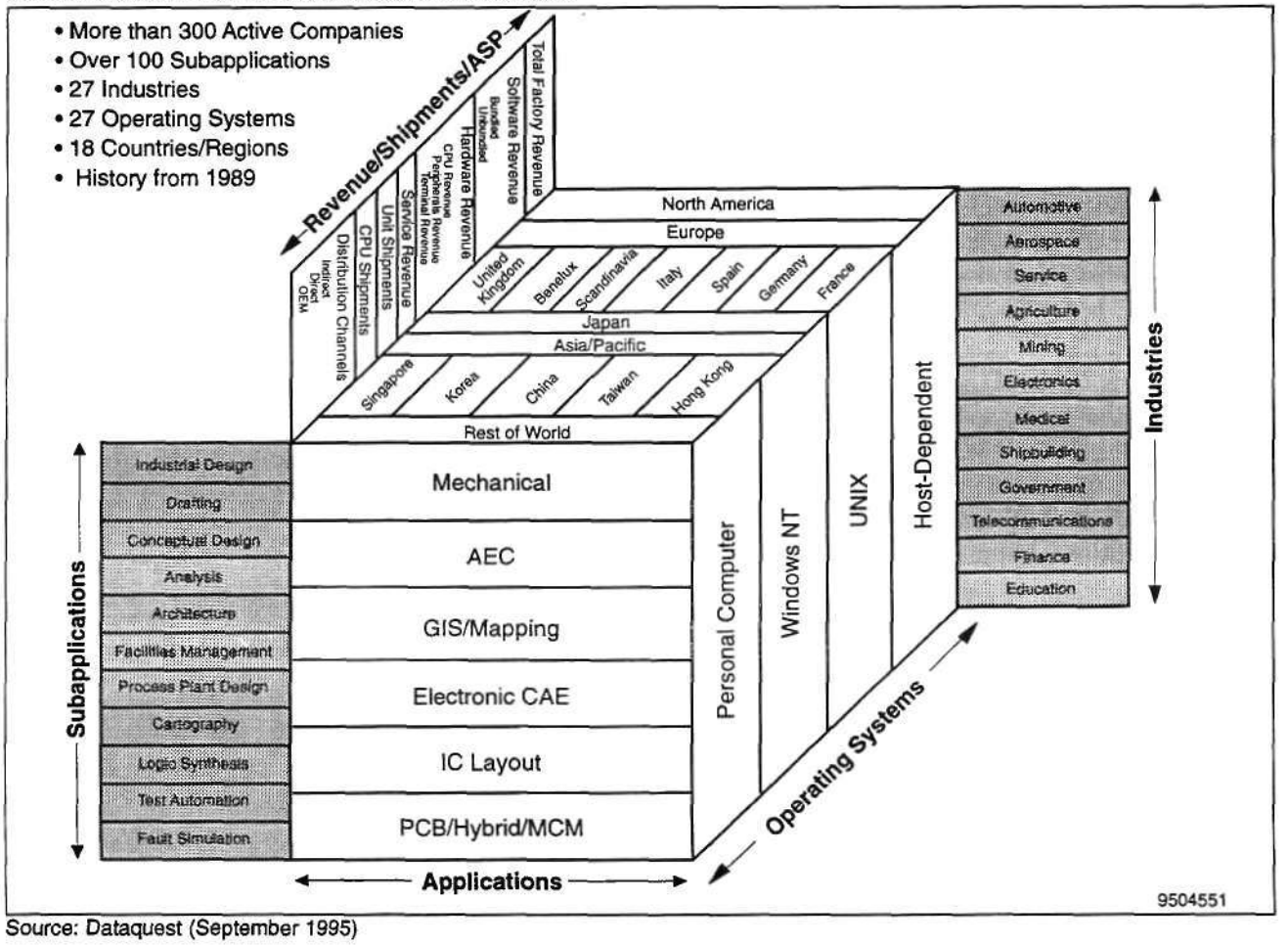
Introduction

CAD/CAM/CAE/GIS systems have dramatically changed the methods by which designers and production managers originate and implement products. CAD and CAE systems allow designers to create, draft, analyze, test, and manipulate products on a screen in two and three dimensions. As CAD/CAM/CAE/GIS systems continue to decrease in cost, they become more available and cost-justifiable to new users.

In order to provide a comprehensive view of the CAD/CAM/CAE/GIS industry, Dataquest's CAD/CAM/CAE/GIS group maintains a large database of industry information. The type of information contained in the database is depicted in Figure 1.

Table 1 summarizes the performance in various segments of the CAD/CAM/CAE/GIS markets in 1994 versus 1993.

Figure 1
CAD/CAM/CAE/GIS Market Database



Source: Dataquest (September 1995)

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Table 1
CAD/CAM/CAE/GIS Market Summary, 1993 to 1994

	Software Revenue		1993-1994	Total Factory Revenue		1993-1994	Seat Shipments		1993-1994
	1993	1994	Growth (%)	1993	1994	Growth (%)	1993	1994	Growth (%)
Applications									
Mechanical	2,248.9	2,455.5	9.2	7,374.9	7,968.8	8.1	279,480	298,442	6.8
AEC	752.3	849.0	12.9	2,204.7	2,401.1	8.9	198,114	211,550	6.8
GIS/Mapping	793.1	917.2	15.7	2,129.2	2,420.9	13.7	88,672	108,107	21.9
Electronic CAE	803.3	886.3	10.3	2,297.0	2,482.2	8.1	94,651	108,019	14.1
IC Layout	180.8	216.9	20.0	601.0	721.7	20.1	10,911	12,740	16.8
PCB/MCM/Hybrid	244.0	252.1	3.3	789.8	788.3	-0.2	29,042	27,766	-4.4
Electronic Design Automation	1,228.0	1,355.2	10.4	3,687.8	3,992.2	8.3	134,604	148,525	10.3
All Applications	5,022.3	5,577.0	11.0	15,396.6	16,782.9	9.0	700,869	766,623	9.4
Region									
North America	1,856.7	2,045.6	10.2	5,614.9	6,189.1	10.2	312,240	343,290	9.9
Europe	1,660.3	1,864.4	12.3	5,272.8	5,750.2	9.1	237,945	258,480	8.6
Japan	1,203.4	1,315.8	9.3	3,728.1	3,909.9	4.9	99,963	102,239	2.3
Asia/Pacific	208.0	255.4	22.8	538.2	676.9	25.8	33,753	44,643	32.3
Rest of World	93.9	95.8	2.0	242.6	256.9	5.9	16,968	17,971	5.9
Worldwide	5,022.3	5,577.0	11.0	15,396.6	16,782.9	9.0	700,869	766,623	9.4
Operating System									
UNIX	3,466.6	3,874.3	11.8	10,861.7	11,946.9	10.0	192,244	221,152	15.0
Host	301.4	197.9	-34.3	1,616.0	1,269.4	-21.5	27,091	21,566	-20.4
Windows NT	5.5	106.4	1,845.3	10.3	282.7	2,644.1	226	6,764	2,892.9
PC	1,248.9	1,398.3	12.0	2,908.5	3,283.9	12.9	481,308	517,141	7.4
All Operating Systems	5,022.3	5,577.0	11.0	15,396.6	16,782.9	9.0	700,869	766,623	9.4

Note: This table includes software content (data) companies for GIS/mapping. However, the AEC and GIS market share book (*1994 CAD/CAM/CAE/GIS AEC and GIS Market Share*, CAEC-WW-MS-9501) does not.
Source: Dataquest (September 1995)

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About This Document

This document contains Dataquest's detailed market share information on the CAD/CAM/CAE/GIS industry. The following list contains descriptions of the companies included in the Market Share books. See Tables 2, 3, 4, and 5 for changes from our 1993 report.

- Mechanical applications—All companies in database with mechanical revenue
- GIS and AEC applications—All companies in database with GIS revenue and all companies in database with AEC revenue. We also have added GIS data companies.
- Electronic design automation applications—All companies in database with EDA (electronic CAE, IC layout, PCB/hybrid/MCM) revenue
- Europe overview—All companies with European revenue
- Asia—All companies with Asian revenue

We no longer publish top-level market statistics for the entire CAD/CAM/CAE/GIS industry. This data is available by calling Suzanne Snygg at (408) 468-8124. More detailed data on these markets may be requested through our client inquiry service.

We no longer publish data by hardware platform; instead we report by four major operating systems: UNIX, host, Windows NT, and PC.

This document represents our final estimates of 1994 shipments and revenue.

Dataquest's policy is to continually update its market information, for current and past years, with any new data received in order to arrive at the most accurate market representation possible.

Table 2
Companies Renamed Since 1993

Original Company Name	New Company Name
ACDS Graphic System	Geomax International
Genrad	VEDA
GeoVision	SHL Systemhouse
Graphisoft Software Dev	Graphisoft Group
ICAD	Concentra
Kohns & Poppenhaeger	Poppenhaeger Grips GmbH
Microway	M.O.C.
Scientific & Engineering Software	SES Inc.
Silvar-Lisco	SVRI (Silicon Valley Research Inc.)
Smallworld Systems	SmallworldWide
Swanson Analysis	Ansys
Tactics International	Tactician Corporation

Source: Dataquest (September 1995)

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Table 3
Companies (or CAD Portions of Companies) Sold/Merged in 1994

Company Name	Acquired by/Merged with
Aries Technology	MacNeal-Schwendler
ANACAD-EES	Mentor Graphics
Betronex & Visionics	Norlinvest Ltd.
Cisigraph	Matra
Digital—Mechanical Software	PROCAD GmbH
Chronological Simulation	Viewlogic
Computervision—GIS	Unisys
Control Data—Mechanical Software	ICEM Technologies
Foresight Resources	Softdesk
Generation 5 Technology	Geo/SQL Corporation
Gerber Systems (CAD portion)	Matra
Kork Systems	Autometric
LandCadd	Eagle Point
Logic Modeling Corp.	Synopsys
Massteck	OrCAD
Model Technology	Mentor Graphics
NeoCAD	Xilinx
PDA Engineering	MacNeal-Schwendler
Point Control	CAMAX Manufacturing
Racal-Redac	Zuken-Redac
Sunrise	Viewlogic
Syscan	Sysdeco Innovation

Source: Dataquest (September 1995)

Table 4
Companies Deleted from Database Since 1993

Region/Company	
North American	European
A.I. Systems	Aplein*
Apple Computer	Aucos elektronische
Aura CAD/CAM Systems	BATISOFT
CAE-link	CAD-Capture
Claris	CAD TECH Iberica*
Compact Software	CAMTEK
Control Data—Hardware	Caroline Informatique
Data General	Contract Data Research
ECOM Associates	Data Technology/DATECH*
Georgia Tech Research	Datagraphic
GEOVISION Inc.	DELTA CAD*
Infinite Graphics	EME

(Continued)

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Table 4
Companies Deleted from Database Since 1993 (Continued)

Region/Company	
North American (Continued)	European (Continued)
Innovative Data Design	FEA
Intrinsix	FEGS
Land Innovation	ItalCad
Maptech	Kreon
MC2 Engineering Software	Lamp Software
Moda CAD	Logic Systems Designers*
Phase Three Logic	Macao Systems
Synercom	MEDESIGN
Teradyne	Mucke Software
Understanding Systems	S.T.L.D.s.r.l.
Asian	Soft*
Kanematsu Semiconductor*	

*Distributors
Source: Dataquest (September 1995)

Table 5
Companies Added to Database Since 1993

Region/Company	
North American	European
3Soft	Abstract Hardware
Access Corp.	ACA Ltd.
ArcSys	Cimtel Ltd.
B.A. Intelligence Networks	Eigner + Partner GmbH
Boothroyd Dewhurst	HoSoft CAD
Cadis Software	Speed
CGTech	Spot Image Corp.
Chronology	ULTimate Technology
Cimplex	WiN Technology
Claritas/NPDC	
CMstat	
CSAR Corp.	
Database Applications Inc.	
Deneb Robotics	
DB Technology	
Design Acceleration	
Eagle Point	
EOSAT	
Equifax/NDS	
Fintronic	
Formtek	
Geographic Data Technology	
Gibbs and Assoc.	

(Continued)

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Table 5
Companies Added to Database Since 1993 (Continued)

Region/Company
North American (Continued)
Integrity Engineering
InterHDL
Intusoft
Livermore Software Tech. Corp.
Nextwave DA
NOVASOFT Systems
OEA International
Optem Engineering
Rebis (merger of EDA and ADev)
Sherpa Corp.
Simulation Technology
SRAC
Surfware
T D Technology
Tecnomatics Tech.
UniCAD
Variation Systems Analysis
Veritools
VISTA Environmental Inf.
Workgroup Tech

*Distributors
Source: Dataquest (September 1995)

Segmentation Definitions

This section lists the definitions specific to this document. The following paragraphs define the segments.

Applications

Mechanical

The mechanical segment refers to computer-aided tools used by engineers, designers, analysts, technicians, and draftspeople working predominantly in the discrete manufacturing industries, but includes government and education. Users of mechanical CAD/CAM/CAE tools work in all departments across the typical organization, with a majority found in product design, advanced engineering, and manufacturing engineering. Common design applications include conceptual design, industrial design, structural or thermal analysis, detail design, and electromechanical design (the mechanical part of design with electrical or electronic components and mechanisms). Common manufacturing applications include tool and fixture design, numerical control part programming, offline robotics programming, and interface to quality control systems. Management tools for database control and distribution are included in this segment, as well as user-defined application programming.

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Architecture, Engineering, and Construction (AEC)

The AEC segment covers the use of computer-aided tools by architects, contractors, plant engineers, civil engineers, and other people associated with these disciplines to aid in designing and managing buildings, industrial plants, ships, and other types of nondiscrete entities.

Geographic Information Systems (GIS)/Mapping

GIS is computer-based technology, and the segment comprises hardware, software, and data used to capture, edit, display, and analyze spatial (tagged by location) information.

Electronic Design Automation (EDA)

The EDA segment covers computer-based tools used to automate the design of an electronic product, including printed circuit boards, ICs, and systems. EDA includes ECAE, IC layout, and PCB/hybrid/MCM, as follows:

- Electronic computer-aided engineering (ECAE)—These are computer-aided tools used in the engineering or design phase of electronic products (as opposed to the physical layout phase of the product). Examples of electronic CAE applications are schematic capture and simulation.
- IC layout—This is a software application tool used to create and validate the physical implementation of an IC. The IC layout category comprises polygon editors, symbolic editors, placement and routing (gate array, cell, and block), and design verification tools (DRC/ERC/logic-to-layout).
- PCB/hybrid/MCM—This segment covers products used to create the placement and routing of the traces and components laid out on a printed circuit board. Also included in this category are thermal analysis tools.

Regions

The following paragraphs define the regions.

North America

North America includes the United States, Mexico, and Canada.

Europe

Europe includes the United Kingdom, Scandinavia, Benelux, France, Germany, Italy, Spain, and Rest of Europe.

Japan

Asia/Pacific

Asia includes Singapore, Taiwan, Korea, China, and Hong Kong.

Rest of World

Rest of World includes all other countries including Australia, New Zealand, India, Africa, Central America, South America, and the Middle East.

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Operating Systems

Dataquest defines the operating systems as follows:

- UNIX: UNIX includes all UNIX variants and older workstation operating systems.
- Host: Host includes minicomputer and mainframe operating systems in which the functions of external workstations are dependent on a host computer.
- Windows NT: Windows NT is the Microsoft operating system. We understand that code for Windows NT and Windows will be merged within the next three years. The probability is high that Microsoft will develop a client environment and a server environment. In our forecast, the future client environment is included in PC operating systems, and the future server environment is referenced as NT. Also included in NT is potential for an additional, new, high-end operating environment that could be developed by any vendor.
- PC: PC includes DOS, Windows, Windows 95, and Apple operating systems.

Metrics

The following paragraphs define measurements:

- Total factory revenue is defined as the amount of money received by a manufacturer for its goods and services measured in U.S. dollars. Total factory revenue does not include revenue that a company may receive from products that are sold to another company for resale (OEM revenue). Total factory revenue is the sum of software revenue, hardware revenue, and service revenue.
- Unit shipment is defined as the number of seats delivered (number of possible simultaneous users of product delivered) excluding OEM shipments.
- Hardware revenue is revenue derived from sales of CPUs (including operating systems), terminals (for host-dependent systems), and peripherals.
- Software revenue is revenue derived from the sale of application software that exists on a company's standard price list.
- Service revenue is defined as all revenue derived from the service and support of CAD/CAM/CAE/GIS systems. Service revenue can be calculated in the tables by subtracting hardware and software revenue from total revenue. A split by hardware service and software service is available through inquiry.
  - Maintenance fees for hardware and software
  - Management and operations services—help desk, education and training, disaster recovery, vaulting, and configuration management

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- Service bureau—project work, including construction of database, data conversion, product design, analysis, or manufacturing
- Application development—design and development of customized software applications or the modification, enhancement of customization of existing software applications, adding new functionality
- Consulting revenue—assessment of CAD/CAM/CAE/GIS business and information technology needs and the formulation of a plan based on needs identification
- Implementation and integration services—planning, implementation, migration, and integration of software products (software network support and integration, account integration management, data center design, and construction)

Market Share Methodology

Dataquest uses both primary and secondary sources to produce our market share data. In the fourth quarter of each year and second quarter of the subsequent year, we survey all participants in each industry. Each vendor is offered the opportunity to self-report the information required. Although there is a primary contact for each company, large companies are surveyed across product lines and across geographic regions. Thus there is a corresponding increase in the number of contacts at large companies. (Dataquest maintains a large contact database on all sources of information.) Examples of the job titles of people contacted for information are the following:

- President and CEO
- Vice president and general manager
- Vice president of marketing
- Vice president, strategic product planning
- Director of strategic planning
- Director of marketing
- Director of market development
- Manager, CAD/CAM/CAE/GIS marketing programs
- Market research analyst

The Audit Process

Data supplied by vendors is evaluated against information drawn from many sources, including the following:

- Revenue published by major industry participants
- Estimates made by knowledgeable and reliable industry spokespersons
- Government data or trade association data

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- Published product literature and price lists
- Interviews with knowledgeable manufacturers, distributors, and users
- Relevant economic data
- Information and data from online data banks
- Articles in both the general and trade press
- Annual reports, SEC documents, credit reports
- Company publications and press releases
- Reports from financial analysts
- User studies
- Reseller and supplier reports and reports from a vendor's competitors

Dataquest also sums vendor revenue across other industries covered by Dataquest to make sure that revenue is not credited twice, and checks with multiple sources at one company to cross-check data on that company.

Dataquest analysts have many years of experience in how to apply the tools described to get the most accurate information possible on a particular company (such as what to use when and what industry averages are). We believe that the estimates presented here are the most accurate and meaningful generally available today. It is the CAD/CAM/CAE/GIS group's policy to continually update our market information for any year, based on any new data received, in order to arrive at the most accurate market representation possible.

Dataquest's CAD/CAM/CAE/GIS market numbers are often higher than those reported by other sources. We survey worldwide, which involves more vendors, higher total market revenue, lower market share per vendor, and a more accurate market picture—which is particularly useful when comparing regions or applications.

Publishing Schedule

We publish market share and forecasting twice each year for each, allowing for both timely distribution of data and thorough analysis and forecasting. Our annual delivery schedule is as follows:

- Market share will be published and distributed to clients by March 31.
- Forecasting from the market share tables provides a five-year forecast period, available after April 30. The books will be shipped by May 31.
- Final updated market share tables, based on additional data collection and analysis, will be completed by June 30. At this point, the market share database is frozen and will not be changed until the end of the year. For the next six months, supplementary market data will be based on this final market data. Books will be shipped by July 31. (Unfortunately, because of our database changes, updated market share table delivery was delayed beyond this date.)

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- We provide complete final forecast tables by July 31. These tables take into consideration changes in the market share during the previous six months. Books will be shipped by September 31.

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Table A-1
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Italy Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	IBM	16.1	14.1	15.7	10.9	12.2
2	Autodesk	10.6	11.8	13.5	14.0	10.5
3	CAD Lab	14.4	10.7	11.9	10.9	9.3
4	Computervision	26.8	13.8	9.7	-30.2	7.5
5	ESRI	2.5	4.8	6.8	41.8	5.3
6	Parametric Technology	1.6	3.4	5.9	72.4	4.6
7	Matra Datavision	5.4	5.2	5.3	2.0	4.1
8	Siemens Nixdorf Info systeme	5.6	5.0	5.1	2.0	4.0
9	Dassault*	5.2	4.5	4.7	5.0	3.7
10	Intergraph	5.3	4.4	4.6	4.1	3.6
11	Hewlett-Packard	5.6	3.7	3.7	0.2	2.9
12	Cadence	4.7	3.0	3.2	6.9	2.5
13	MacNeal-Schwendler	4.3	4.0	2.9	-26.7	2.3
14	IEZ	0.5	1.5	2.8	90.4	2.2
15	SDRC	2.9	2.7	2.1	-22.1	1.7
16	Cimatron	2.5	2.2	2.0	-6.0	1.6
17	Mentor Graphics	2.8	2.9	1.9	-36.3	1.5
18	Nemetschek	0.2	0.4	1.7	296.4	1.4
19	Wiechers Datentechnik	0.1	0.8	1.1	51.0	0.9
20	Star Informatic	2.0	1.0	1.1	8.9	0.9
21	Synopsys	0.5	0.9	1.0	7.5	0.8
22	Harris EDA	0.8	0.9	1.0	3.2	0.7
23	Viewlogic Systems	0.5	0.6	0.9	49.4	0.7
24	Altium*	1.7	1.2	0.9	-24.0	0.7
25	Investronica SA	1.7	1.7	0.8	-51.7	0.7
26	Ansys	0.8	0.7	0.8	9.1	0.6
27	UNISYS	0.5	0.6	0.7	30.4	0.6
28	Technische Computer Systeme	0.1	0.6	0.7	30.9	0.6
29	Zuken-Redac	0.7	0.5	0.7	42.8	0.5
30	Tebis	1.2	0.6	0.7	16.9	0.5
	Other Companies	9.1	8.9	9.3	5.1	7.3
	All N.A. Companies	88.3	75.9	78.5	3.4	61.3
	All European Companies	56.3	40.5	39.6	-2.2	30.9
	All Asian Companies	0.7	0.5	0.7	42.8	0.5
	All Companies	154.5	125.7	128.1	1.9	100.0

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-2
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Italy Software Companies, Mechanical, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	IBM	14.3	12.2	13.7	12.4	18.7
2	CAD Lab	14.4	10.7	11.9	10.9	16.3
3	Computervision	22.7	12.6	9.0	-28.8	12.2
4	Parametric Technology	1.6	3.4	5.9	72.4	8.0
5	Autodesk	4.2	4.7	5.4	14.3	7.4
6	Matra Datavision	5.4	5.2	5.3	2.4	7.2
7	Dassault*	4.8	4.4	4.6	5.1	6.3
8	MacNeal-Schwendler	4.1	3.8	2.6	-31.5	3.6
9	Hewlett-Packard	4.7	2.7	2.6	-2.7	3.6
10	SDRC	2.9	2.7	2.1	-22.1	2.9
11	Cimatron	2.5	2.2	2.0	-6.0	2.8
12	Intergraph	1.7	1.4	1.4	-0.9	1.9
13	Investronica SA	1.7	1.7	0.8	-51.7	1.1
14	Ansys	0.8	0.7	0.8	9.1	1.0
15	Tebis	1.2	0.6	0.7	16.9	0.9
16	Vero International Software	0.7	0.5	0.7	45.3	0.9
17	Altium*	1.3	0.8	0.6	-23.1	0.8
18	Delcam International	1.1	0.5	0.6	19.2	0.8
19	Han Dataport	0.5	0.4	0.5	26.8	0.7
20	CAMAX Manufacturing	-	0.2	0.5	190.6	0.7
21	Siemens Nixdorf Info systeme	0.6	0.5	0.5	-5.8	0.7
22	Applicon	0.7	0.5	0.4	-12.2	0.6
23	Mechanical Dynamics	-	0.3	0.4	20.0	0.5
24	Anilam Electronics	0.2	0.3	0.3	6.3	0.5
25	ADRA Systems	-	0.3	0.3	11.5	0.4
26	ISD Software	0.3	0.2	0.3	8.2	0.4
27	MCS	0.2	0.3	0.2	-15.8	0.3
28	CIMLINC	0.2	0.2	0.2	17.3	0.3
29	ICEM Technologies	0.4	0.2	0.2	6.5	0.3
30	Gerber Systems	0.1	0.2	0.2	-4.3	0.3
	Other Companies	2.9	2.2	2.4	5.5	3.2
	All N.A. Companies	58.3	46.3	45.9	-0.9	62.8
	All European Companies	37.5	28.0	24.9	-11.2	34.0
	All Asian Companies	-	-	-	NA	-
	All Companies	98.7	76.6	73.2	-4.5	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-3
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Italy Software Companies, AEC, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Autodesk	4.6	5.1	5.9	15.6	33.1
2	IEZ	0.5	1.5	2.8	90.4	15.8
3	Nemetschek	0.2	0.4	1.7	296.4	9.8
4	Intergraph	1.6	1.4	1.5	6.6	8.3
5	IBM	1.2	1.3	1.4	3.0	7.8
6	Computervision	3.2	1.0	0.7	-30.5	3.9
7	Soft-Tech Software Technologies	0.2	0.4	0.6	58.3	3.2
8	Graphisoft Group	0.6	0.5	0.5	11.6	3.0
9	Technische Computer Systeme	0.1	0.3	0.5	44.1	2.8
10	Star Informatic	1.2	0.4	0.5	27.8	2.6
11	Rebis	-	-	0.2	NA	1.0
12	CAD Centre	-	0.1	0.1	37.3	0.8
13	Hochtief	0.1	0.1	0.1	57.6	0.6
14	MOSS Systems Group	-	0.1	0.1	18.1	0.5
15	Dassault*	0.4	0.1	0.1	1.2	0.5
16	Altium*	0.2	0.2	0.1	-53.5	0.5
17	RoboCAD Solutions	0.1	0.1	0.1	-12.0	0.4
18	Ziegler Informatics	0	0	0	108.3	0.2
19	EA Systems	-	0	0	-10.0	0.1
20	PAFEC	0	0	0	-	0.1
21	ItalCad	4.7	1.6	-	-100.0	-
22	MEDesign	0.1	0.1	-	-100.0	-
23	GDS	0.1	0	-	-100.0	-
24	BATISOFT	0	0	-	-100.0	-
25	Matra Datavision	-	0	-	-100.0	-
	Other Companies	1.0	1.1	1.1	1.7	6.0
	All N.A. Companies	10.6	8.9	9.6	8.5	54.2
	All European Companies	8.4	5.5	7.1	28.4	39.8
	All Asian Companies	-	-	-	NA	-
	All Companies	20.0	15.4	17.8	15.1	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-4
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Italy Software Companies, GIS/Mapping, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	ESRI	2.5	4.8	6.8	41.8	35.2
2	Siemens Nixdorf Info systeme	4.9	4.4	4.6	3.1	23.7
3	Intergraph	1.7	1.5	1.6	9.4	8.3
4	Autodesk	1.2	1.3	1.5	15.0	7.8
5	UNISYS	0.5	0.6	0.7	30.4	3.8
6	IBM	0.4	0.4	0.4	-2.6	1.9
7	PCI Remote Sensing Corp	-	0.3	0.3	16.4	1.8
8	APIC Systemes	0.2	0.2	0.3	28.8	1.3
9	Laser-Scan	0	0.1	0.1	6.7	0.7
10	Star Informatic	0.8	0.1	0.1	20.0	0.6
11	Sysdeco Innovation	0.1	0.1	0.1	12.5	0.5
12	Clemessy Geocity	-	0	0	9.5	0.3
13	PAFEC	0	0	0	-	0.2
14	Ziegler Informatics	0	0	0	-20.0	0.1
15	Computervision	0.3	0.3	-	-100.0	-
16	ItalCad	1.0	0.2	-	-100.0	-
	Other Companies	1.6	2.3	2.7	16.8	14.0
	All N.A. Companies	6.5	9.0	11.3	25.3	58.7
	All European Companies	10.0	5.2	5.3	0.5	27.3
	All Asian Companies	-	-	-	NA	-
	All Companies	18.1	16.6	19.3	16.3	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-5
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Italy Software Companies, Electronic Design Automation, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Cadence	4.7	3.0	3.2	6.9	18.1
2	Mentor Graphics	2.8	2.9	1.9	-36.3	10.5
3	Hewlett-Packard	0.9	1.0	1.1	7.9	6.0
4	Synopsys	0.5	0.9	1.0	7.5	5.6
5	Wiechers Datentechnik	0	0.6	1.0	67.4	5.5
6	Harris EDA	0.8	0.9	1.0	3.2	5.4
7	Viewlogic Systems	0.5	0.6	0.9	49.4	5.1
8	Autodesk	0.6	0.7	0.7	-1.2	3.9
9	Zuken-Redac	0.7	0.5	0.7	42.8	3.9
10	Norlinvest Ltd.	0.3	0.4	0.6	63.2	3.5
11	Star Informatic	-	0.6	0.5	-5.5	2.9
12	COMPASS Design Automation	0.3	0.5	0.5	-3.0	2.9
13	Zycad	0.3	0.3	0.3	-3.1	1.8
14	MacNeal-Schwendler	0.1	0.1	0.3	110.8	1.6
15	IBM	0.3	0.2	0.2	-2.3	1.2
16	Altium*	0.3	0.2	0.2	-2.3	1.2
17	Intergraph	0.4	0.2	0.2	-17.5	1.0
18	VLSI Libraries	-	-	0.1	NA	0.6
19	PADS Software	-	0.1	0.1	21.2	0.6
20	Abstract Hardware	-	-	0.1	NA	0.5
21	Technische Computer Systeme	0	0.1	0.1	80.0	0.5
22	3Soft	-	-	0.1	NA	0.4
23	Summitt Design	0.1	0.1	0.1	3.6	0.4
24	ULTImate Technology	0.1	0.1	0.1	12.1	0.3
25	ALS Design	0.1	0	0	17.0	0.3
26	Design Acceleration	-	-	0	NA	0.2
27	Siemens Nixdorf Info systeme	0	0	0	-22.6	0.2
28	Silicon Valley Research	-	-	0	NA	0.1
29	Ziegler Informatics	0.1	0.1	0	-85.9	0.1
30	Intusoft	-	-	0	NA	0
	Other Companies	2.5	2.8	3.0	7.3	17.1
	All N.A. Companies	12.9	11.7	11.6	-0.3	65.3
	All European Companies	0.5	1.8	2.4	38.6	13.7
	All Asian Companies	0.7	0.5	0.7	42.8	3.9
	All Companies	16.6	16.7	17.8	6.3	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-6
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Italy Software Companies, Electronic CAE, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Cadence	2.8	1.7	1.8	6.1	14.4
2	Mentor Graphics	1.8	1.9	1.1	-39.9	9.1
3	Hewlett-Packard	0.9	1.0	1.1	7.9	8.6
4	Synopsys	0.5	0.9	1.0	7.5	8.1
5	Wiechers Datentechnik	0	0.6	1.0	67.4	7.9
6	Viewlogic Systems	0.5	0.6	0.9	49.4	7.3
7	Autodesk	0.6	0.7	0.7	-1.2	5.7
8	Star Informatic	-	0.6	0.5	-5.5	4.2
9	Zycad	0.3	0.3	0.3	-3.1	2.6
10	MacNeal-Schwendler	0.1	0.1	0.3	110.8	2.3
11	COMPASS Design Automation	0.2	0.3	0.3	-16.2	2.3
12	Intergraph	0.2	0.1	0.1	-8.8	0.9
13	VLSI Libraries	-	-	0.1	NA	0.8
14	Zuken-Redac	0.6	0.2	0.1	-53.8	0.8
15	Harris EDA	0.1	0.1	0.1	66.7	0.8
16	Abstract Hardware	-	-	0.1	NA	0.7
17	Technische Computer Systeme	0	0.1	0.1	80.0	0.7
18	3Soft	-	-	0.1	NA	0.7
19	Design Acceleration	-	-	0	NA	0.3
20	ALS Design	-	-	0	NA	0.3
21	Norlinvest Ltd.	0	0	0	50.0	0.2
22	Siemens Nixdorf Info systeme	0	0	0	-22.6	0.2
23	PADS Software	-	0	0	-20.5	0.1
24	Ziegler Informatics	0	0	0	-88.5	0
25	Intusoft	-	-	0	NA	0
	Other Companies	2.1	2.5	2.5	3.4	20.7
	All N.A. Companies	8.1	7.7	7.9	1.6	64.0
	All European Companies	0.1	1.3	1.8	38.7	14.4
	All Asian Companies	0.6	0.2	0.1	-53.8	0.8
	All Companies	10.9	11.7	12.3	5.0	100.0

NA = Not applicable
*Company statistics contain VAR/distributor revenue not counted in total
Source: Dataquest (August 1995)

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Table A-7
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Italy Software Companies, IC Layout, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Cadence	1.6	1.1	1.2	10.7	61.4
2	Mentor Graphics	0.2	0.3	0.3	-5.6	13.7
3	COMPASS Design Automation	0.1	0.2	0.2	19.8	11.8
4	Summitt Design	0.1	0.1	0.1	3.6	3.3
5	Silicon Valley Research	-	-	0	NA	1.3
6	Intergraph	0	0	0	-19.3	0.6
	Other Companies	0.1	0.1	0.2	58.7	7.9
	All N.A. Companies	2.1	1.7	1.8	10.0	92.1
	All European Companies	-	-	-	NA	-
	All Asian Companies	-	-	-	NA	-
	All Companies	2.1	1.8	2.0	12.7	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-8
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Italy Software Companies, PCB/MCM/Hybrid, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Harris EDA	0.7	0.9	0.9	-1.1	25.0
2	Norlinvest Ltd.	0.2	0.4	0.6	63.9	17.2
3	Zuken-Redac	0.2	0.3	0.6	124.6	17.0
4	Mentor Graphics	0.8	0.8	0.5	-38.8	13.6
5	Cadence	0.3	0.3	0.2	-4.0	7.0
6	IBM	0.3	0.2	0.2	-2.3	6.1
7	Altium*	0.3	0.2	0.2	-2.3	6.1
8	PADS Software	-	0.1	0.1	26.5	2.7
9	Intergraph	0.2	0.1	0.1	-30.0	1.6
10	ULTImate Technology	0.1	0.1	0.1	12.1	1.6
11	ALS Design	0.1	0	0	-71.0	0.3
12	Ziegler Informatics	0	0	0	-82.4	0.2
	Other Companies	0.2	0.2	0.3	56.9	7.6
	All N.A. Companies	2.7	2.3	1.9	-14.5	56.1
	All European Companies	0.4	0.5	0.7	38.1	19.3
	All Asian Companies	0.2	0.3	0.6	124.6	17.0
	All Companies	3.5	3.2	3.4	8.7	100.0

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-9
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Italy Software Companies, All Applications, UNIX

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	IBM	7.5	9.3	11.1	19.3	12.9
2	Computervision	25.3	12.8	9.2	-28.2	10.7
3	CAD Lab	12.0	8.4	8.1	-3.5	9.4
4	Parametric Technology	1.6	3.2	5.3	62.5	6.1
5	Matra Datavision	5.4	5.1	5.2	1.8	6.0
6	ESRI	2.0	3.4	4.7	37.5	5.5
7	Siemens Nixdorf Info systeme	5.0	3.2	3.6	14.6	4.2
8	Dassault*	3.3	3.1	3.5	11.4	4.1
9	Hewlett-Packard	5.5	3.6	3.4	-5.8	3.9
10	Cadence	4.6	3.0	3.2	6.9	3.7
11	IEZ	0.5	1.5	2.7	80.4	3.1
12	Intergraph	4.5	3.3	2.4	-26.5	2.8
13	SDRC	2.8	2.7	2.1	-21.3	2.5
14	MacNeal-Schwendler	1.7	1.5	1.9	25.3	2.2
15	Mentor Graphics	2.7	2.9	1.8	-36.5	2.1
16	Star Informatic	2.0	1.0	1.0	5.1	1.2
17	Synopsys	0.5	0.9	1.0	7.5	1.2
18	Harris EDA	0.8	0.9	0.9	1.1	1.0
19	Autodesk	0.6	0.7	0.8	14.0	0.9
20	Cimatron	1.5	1.0	0.8	-23.5	0.9
21	Nemetschek	0.1	0.1	0.8	772.1	0.9
22	UNISYS	0.5	0.5	0.7	33.6	0.8
23	Zuken-Redac	0.7	0.4	0.7	60.0	0.8
24	Delcam International	1.0	0.5	0.5	17.2	0.6
25	Ansys	0.5	0.4	0.5	21.6	0.6
26	COMPASS Design Automation	0.3	0.5	0.5	-3.0	0.6
27	Han Dataport	0.4	0.3	0.5	45.5	0.6
28	Wiechers Datentechnik	0	0.3	0.5	63.2	0.6
29	Applicon	0.7	0.5	0.4	-15.0	0.5
30	Viewlogic Systems	0.3	0.4	0.4	5.9	0.4
	Other Companies	6.6	6.7	7.0	3.9	8.2
	All N.A. Companies	63.2	52.4	52.5	0.3	61.0
	All European Companies	45.3	28.4	25.9	-9.0	30.0
	All Asian Companies	0.7	0.4	0.7	60.0	0.8
	All Companies	115.8	87.9	86.0	-2.1	100.0

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-10
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Italy Software Companies, All Applications, NT/Hybrid

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Intergraph	-	0.1	1.0	1,731.8	48.3
2	Parametric Technology	-	-	0.6	NA	27.5
3	ESRI	-	-	0.3	NA	14.4
4	IEZ	-	-	0.1	NA	7.0
5	PCI Remote Sensing Corp	-	-	0	NA	0.8
6	Mentor Graphics	-	-	0	NA	0.7
7	EA Systems	-	-	0	NA	0.4
8	Intusoft	-	-	0	NA	0.1
	Other Companies	-	0	0	86.6	0.8
	All N.A. Companies	-	0.1	2.0	3,399.6	92.2
	All European Companies	-	-	0.1	NA	7.0
	All Asian Companies	-	-	-	NA	-
	All Companies	-	0.1	2.1	3,142.2	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-11
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Italy Software Companies, All Applications, Personal Computer

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Autodesk	10.0	11.1	12.7	14.0	37.1
2	CAD Lab	2.4	2.4	3.8	61.8	11.2
3	ESRI	0.5	1.1	1.5	30.5	4.3
4	Cimatron	1.0	1.1	1.2	10.2	3.6
5	Intergraph	0.8	1.0	1.2	14.0	3.4
6	Siemens Nixdorf Info systeme	-	0.7	1.0	35.0	2.9
7	Nemetschek	0.1	0.4	1.0	174.1	2.8
8	IBM	1.7	1.2	0.9	-24.0	2.6
9	Altium*	1.7	1.2	0.9	-24.0	2.6
10	Investronica SA	1.7	1.7	0.8	-51.7	2.5
11	Vero International Software	0.7	0.5	0.7	45.3	1.9
12	Wiechers Datentechnik	0.1	0.5	0.6	42.9	1.9
13	Norlinvest Ltd.	0.3	0.4	0.6	63.2	1.8
14	Tebis	1.2	0.6	0.6	4.9	1.7
15	Soft-Tech Software Technologies	0.2	0.4	0.6	58.3	1.7
16	Graphisoft Group	0.7	0.5	0.5	11.6	1.6
17	Viewlogic Systems	0.2	0.2	0.5	115.7	1.5
18	Computervision	1.3	1.1	0.5	-54.2	1.4
19	Technische Computer Systeme	0	0.2	0.4	58.3	1.1
20	Anilam Electronics	0.2	0.3	0.3	6.3	1.0
21	Hewlett-Packard	0.1	0.1	0.3	344.1	0.8
22	CAMAX Manufacturing	-	-	0.2	NA	0.6
23	Rebis	-	-	0.2	NA	0.5
24	Ansys	0.2	0.2	0.2	9.1	0.5
25	PCI Remote Sensing Corp	-	0.1	0.2	74.6	0.5
26	MCS	0.1	0.1	0.2	17.5	0.5
27	Ziegler Informatics	0.2	0.2	0.1	-32.1	0.4
28	CNC Software	0.1	0.1	0.1	27.1	0.4
29	RoboCAD Solutions	0.1	0.1	0.1	-12.0	0.4
30	Matra Datavision	-	0.1	0.1	13.4	0.3
	Other Companies	1.9	1.8	2.2	18.5	6.4
	All N.A. Companies	14.9	16.8	18.8	12.1	55.1
	All European Companies	10.0	10.9	13.1	20.4	38.4
	All Asian Companies	0	0.1	0	-77.4	0
	All Companies	26.8	29.6	34.2	15.4	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-12
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Italy Software Companies, All Applications, Host/Proprietary

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	IBM	6.9	3.7	3.7	0.5	63.9
2	Dassault*	1.9	1.4	1.2	-10.0	21.1
3	MacNeal-Schwendler	2.5	2.4	1.1	-56.8	18.3
4	Siemens Nixdorf Info systeme	0.6	1.1	0.5	-57.3	8.0
5	ESRI	0	0.2	0.3	27.5	5.3
6	Ansys	0.2	0.1	0.1	-35.8	1.3
7	Mechanical Dynamics	-	0	0.1	18.0	0.9
8	Computational Mechanics	0.1	0	0	-19.7	0.6
9	PCI Remote Sensing Corp	-	0	0	16.4	0.3
10	Framasoft	-	0	0	20.9	0.2
11	Whessoe Computing Systems	0	0	0	-	0.2
12	EA Systems	-	0	0	-43.8	0.1
13	GRAFTEK	0	0	0	-11.1	0
14	Intergraph	-	0.1	-	-100.0	-
15	ICEM Technologies	0.3	0.1	-	-100.0	-
16	GDS	0.1	0	-	-100.0	-
17	SDRC	0.1	0	-	-100.0	-
18	Harris EDA	0	0	-	-100.0	-
19	Han Dataport	0	0	-	-100.0	-
	Other Companies	0.6	0.2	0.1	-71.7	1.0
	All N.A. Companies	10.2	6.7	5.2	-22.2	90.1
	All European Companies	1.0	1.2	0.5	-57.6	8.9
	All Asian Companies	-	-	-	NA	-
	All Companies	11.8	8.1	5.8	-28.7	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table B-1
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Italy Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	3Soft	-	-	0.1	NA	0.1
2	Abstract Hardware	-	-	0.1	NA	0.1
3	ADRA Systems	-	0.3	0.3	11.5	0.3
4	ALS Design	0.1	0	0	17.0	0
5	Altium*	1.7	1.2	0.9	-24.0	0.7
6	Anilam Electronics	0.2	0.3	0.3	6.3	0.3
7	Ansys	0.8	0.7	0.8	9.1	0.6
8	APIC Systemes	0.2	0.2	0.3	28.8	0.2
9	Applicon	0.7	0.5	0.4	-12.2	0.3
10	Autodesk	10.6	11.8	13.5	14.0	10.5
11	B.A.Intelligence Networks	0	0.1	0.1	56.7	0.1
12	BATISOFT	0	0	-	-100.0	-
13	CAD Centre	0.2	0.1	0.2	37.3	0.1
14	CAD Lab	14.4	10.7	11.9	10.9	9.3
15	Cadence	4.7	3.0	3.2	6.9	2.5
16	CAMAX Manufacturing	-	0.2	0.5	190.6	0.4
17	CAMTEK	0	0	-	-100.0	-
18	CATALPA groupe Missler	0.1	0.1	0	-63.8	0
19	Cimatron	2.5	2.2	2.0	-6.0	1.6
20	CIMLINC	0.2	0.2	0.2	17.3	0.2
21	Clemessy Geocity	-	0	0	9.5	0
22	CNC Software	0.1	0.1	0.1	27.1	0.1
23	COMPASS Design Automation	0.3	0.5	0.5	-3.0	0.4
24	Computational Mechanics	0.1	0.2	0.1	-14.3	0.1
25	Computervision	26.8	13.8	9.7	-30.2	7.5
26	Dassault*	5.2	4.5	4.7	5.0	3.7
27	Delcam International	1.1	0.5	0.6	19.2	0.4
28	Design Acceleration	-	-	0	NA	0
29	EA Systems	-	0	0	-10.0	0
30	ESRI	2.5	4.8	6.8	41.8	5.3
31	FEGS	0	0	-	-100.0	-
32	Framasoft	-	0.1	0.1	31.4	0.1
33	GDS	0.1	0	-	-100.0	-
34	Gerber Systems	0.1	0.2	0.2	-4.3	0.2
35	GRAFTEK	0	0	0	7.1	0
36	Graphisoft Group	0.7	0.5	0.5	11.6	0.4
37	Han Dataport	0.5	0.4	0.5	26.8	0.4

(Continued)

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Italy Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
38	Harris EDA	0.8	0.9	1.0	3.2	0.7
39	Hewlett-Packard	5.6	3.7	3.7	0.2	2.9
40	Hochtief	0.1	0.1	0.1	57.6	0.1
41	IBM	16.1	14.1	15.7	10.9	12.2
42	ICEM Technologies	0.4	0.2	0.2	6.5	0.2
43	IEZ	0.5	1.5	2.8	90.4	2.2
44	Intergraph	5.3	4.4	4.6	4.1	3.6
45	Intusoft	-	-	0	NA	0
46	Investronica SA	1.7	1.7	0.8	-51.7	0.7
47	ISD Software	0.3	0.2	0.3	8.2	0.2
48	ItalCad	12.5	5.3	-	-100.0	-
49	Laser-Scan	0	0.1	0.1	6.7	0.1
50	MacNeal-Schwendler	4.3	4.0	2.9	-26.7	2.3
51	Matra Datavision	5.4	5.2	5.3	2.0	4.1
52	MCS	0.2	0.3	0.2	-15.8	0.2
53	Mechanical Dynamics	-	0.3	0.4	20.0	0.3
54	MEDesign	0.1	0.1	-	-100.0	-
55	Mentor Graphics	2.8	2.9	1.9	-36.3	1.5
56	MOSS Systems Group	-	0.1	0.1	18.1	0.1
57	Nemetschek	0.2	0.4	1.7	296.4	1.4
58	Norlinvest Ltd.	0.3	0.4	0.6	63.2	0.5
59	PADS Software	-	0.1	0.1	21.2	0.1
60	PAFEC	0.2	0.1	0.1	-	0.1
61	Parametric Technology	1.6	3.4	5.9	72.4	4.6
62	Pathtrace Engineering Systems	0	0	0	-50.0	0
63	PCI Remote Sensing Corp	-	0.3	0.3	16.4	0.3
64	Rebis	-	-	0.2	NA	0.1
65	RoboCAD Solutions	0.1	0.1	0.1	-12.0	0.1
66	S.T.L.D. s.r.l.	0.5	0.4	-	-100.0	-
67	SDRC	2.9	2.7	2.1	-22.1	1.7
68	Siemens Nixdorf Info systeme	5.6	5.0	5.1	2.0	4.0
69	Silicon Valley Research	-	-	0	NA	0
70	Soft-Tech Software Technologies	0.2	0.4	0.6	58.3	0.4
71	Star Informatic	2.0	1.0	1.1	8.9	0.9
72	Straessle Informationssysteme	0.2	0.1	0.2	69.4	0.1
73	Summitt Design	0.1	0.1	0.1	3.6	0.1
74	Synopsys	0.5	0.9	1.0	7.5	0.8

(Continued)

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Italy Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
75	Sysdeco Innovation	0.1	0.1	0.1	12.5	0.1
76	Tebis	1.2	0.6	0.7	16.9	0.5
77	Technische Computer Systeme	0.1	0.6	0.7	30.9	0.6
78	ULTImate Technology	0.1	0.1	0.1	12.1	0
79	UNISYS	0.5	0.6	0.7	30.4	0.6
80	Vero International Software	0.7	0.5	0.7	45.3	0.5
81	Viewlogic Systems	0.5	0.6	0.9	49.4	0.7
82	VLSI Libraries	-	-	0.1	NA	0.1
83	Whessoe Computing Systems	0.1	0.1	0.1	9.1	0.1
84	Wiechers Datentechnik	0.1	0.8	1.1	51.0	0.9
85	Ziegler Informatics	0.2	0.2	0.1	-32.1	0.1
86	Zuken-Redac	0.7	0.5	0.7	42.8	0.5
87	Zycad	0.3	0.3	0.3	-3.1	0.2
	Other Companies	9.1	8.9	9.3	5.1	7.3
	All N.A. Companies	88.3	75.9	78.5	3.4	61.3
	All European Companies	56.3	40.5	39.6	-2.2	30.9
	All Asian Companies	0.7	0.5	0.7	42.8	0.5
	All Companies	154.5	125.7	128.1	1.9	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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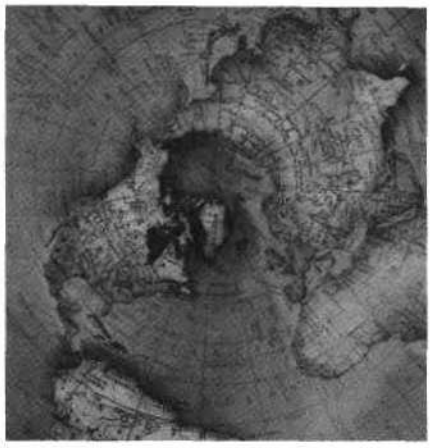
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1994 CAD/CAM/CAE/GIS Germany Market Share Update

Market Statistics

Program: CAD/CAM/CAE/GIS Europe
Product Code: CCAM-EU-MS-9506
Publication Date: September 25, 1995
Filing: Market Analysis

1994 CAD/CAM/CAE/GIS Germany Market Share Update



Market Statistics

Program: CAD/CAM/CAE/GIS Europe
Product Code: CCAM-EU-MS-9506
Publication Date: September 25, 1995
Filing: Market Analysis

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Note: All tables show estimated data.

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1994 CAD/CAM/CAE/GIS Germany Market Share Update

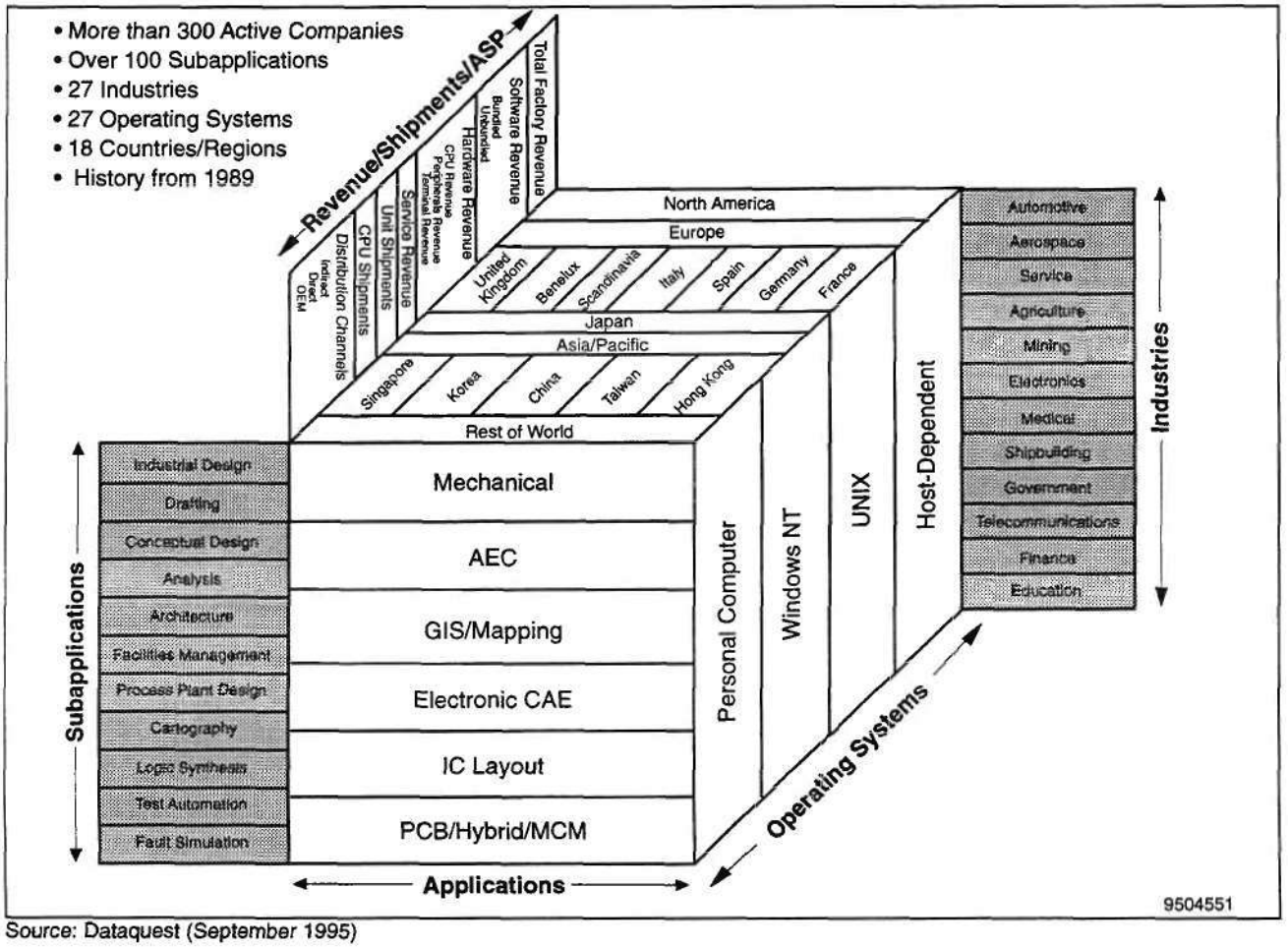
Introduction

CAD/CAM/CAE/GIS systems have dramatically changed the methods by which designers and production managers originate and implement products. CAD and CAE systems allow designers to create, draft, analyze, test, and manipulate products on a screen in two and three dimensions. As CAD/CAM/CAE/GIS systems continue to decrease in cost, they become more available and cost-justifiable to new users.

In order to provide a comprehensive view of the CAD/CAM/CAE/GIS industry, Dataquest's CAD/CAM/CAE/GIS group maintains a large database of industry information. The type of information contained in the database is depicted in Figure 1.

Table 1 summarizes the performance in various segments of the CAD/CAM/CAE/GIS markets in 1994 versus 1993.

Figure 1
CAD/CAM/CAE/GIS Market Database



Source: Dataquest (September 1995)

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Table 1
CAD/CAM/CAE/GIS Market Summary, 1993 to 1994

	Software Revenue		1993-1994	Total Factory Revenue		1993-1994	Seat Shipments		1993-1994
	1993	1994	Growth (%)	1993	1994	Growth (%)	1993	1994	Growth (%)
Applications									
Mechanical	2,248.9	2,455.5	9.2	7,374.9	7,968.8	8.1	279,480	298,442	6.8
AEC	752.3	849.0	12.9	2,204.7	2,401.1	8.9	198,114	211,550	6.8
GIS/Mapping	793.1	917.2	15.7	2,129.2	2,420.9	13.7	88,672	108,107	21.9
Electronic CAE	803.3	886.3	10.3	2,297.0	2,482.2	8.1	94,651	108,019	14.1
IC Layout	180.8	216.9	20.0	601.0	721.7	20.1	10,911	12,740	16.8
PCB/MCM/Hybrid	244.0	252.1	3.3	789.8	788.3	-0.2	29,042	27,766	-4.4
Electronic Design Automation	1,228.0	1,355.2	10.4	3,687.8	3,992.2	8.3	134,604	148,525	10.3
All Applications	5,022.3	5,577.0	11.0	15,396.6	16,782.9	9.0	700,869	766,623	9.4
Region									
North America	1,856.7	2,045.6	10.2	5,614.9	6,189.1	10.2	312,240	343,290	9.9
Europe	1,660.3	1,864.4	12.3	5,272.8	5,750.2	9.1	237,945	258,480	8.6
Japan	1,203.4	1,315.8	9.3	3,728.1	3,909.9	4.9	99,963	102,239	2.3
Asia/Pacific	208.0	255.4	22.8	538.2	676.9	25.8	33,753	44,643	32.3
Rest of World	93.9	95.8	2.0	242.6	256.9	5.9	16,968	17,971	5.9
Worldwide	5,022.3	5,577.0	11.0	15,396.6	16,782.9	9.0	700,869	766,623	9.4
Operating System									
UNIX	3,466.6	3,874.3	11.8	10,861.7	11,946.9	10.0	192,244	221,152	15.0
Host	301.4	197.9	-34.3	1,616.0	1,269.4	-21.5	27,091	21,566	-20.4
Windows NT	5.5	106.4	1,845.3	10.3	282.7	2,644.1	226	6,764	2,892.9
PC	1,248.9	1,398.3	12.0	2,908.5	3,283.9	12.9	481,308	517,141	7.4
All Operating Systems	5,022.3	5,577.0	11.0	15,396.6	16,782.9	9.0	700,869	766,623	9.4

Note: This table includes software content (data) companies for GIS/mapping. However, the AEC and GIS market share book (*1994 CAD/CAM/CAE/GIS AEC and GIS Market Share*, CAEC-WW-MS-9501) does not.
Source: Dataquest (September 1995)

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About This Document

This document contains Dataquest's detailed market share information on the CAD/CAM/CAE/GIS industry. The following list contains descriptions of the companies included in the Market Share books. See Tables 2, 3, 4, and 5 for changes from our 1993 report.

- Mechanical applications—All companies in database with mechanical revenue
- GIS and AEC applications—All companies in database with GIS revenue and all companies in database with AEC revenue. We also have added GIS data companies.
- Electronic design automation applications—All companies in database with EDA (electronic CAE, IC layout, PCB/hybrid/MCM) revenue
- Europe overview—All companies with European revenue
- Asia—All companies with Asian revenue

We no longer publish top-level market statistics for the entire CAD/CAM/CAE/GIS industry. This data is available by calling Suzanne Snygg at (408) 468-8124. More detailed data on these markets may be requested through our client inquiry service.

We no longer publish data by hardware platform; instead we report by four major operating systems: UNIX, host, Windows NT, and PC.

This document represents our final estimates of 1994 shipments and revenue.

Dataquest's policy is to continually update its market information, for current and past years, with any new data received in order to arrive at the most accurate market representation possible.

Table 2
Companies Renamed Since 1993

Original Company Name	New Company Name
ACDS Graphic System	Geomax International
Genrad	VEDA
GeoVision	SHL Systemhouse
Graphisoft Software Dev	Graphisoft Group
ICAD	Concentra
Kohns & Poppenhaeger	Poppenhaeger Grips GmbH
Microway	M.O.C.
Scientific & Engineering Software	SES Inc.
Silvar-Lisco	SVRI (Silicon Valley Research Inc.)
Smallworld Systems	SmallworldWide
Swanson Analysis	Ansys
Tactics International	Tactician Corporation

Source: Dataquest (September 1995)

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Table 3
Companies (or CAD Portions of Companies) Sold/Merged in 1994

Company Name	Acquired by/Merged with
Aries Technology	MacNeal-Schwendler
ANACAD-EES	Mentor Graphics
Betronex & Visionics	Norlinvest Ltd.
Cisigraph	Matra
Digital—Mechanical Software	PROCAD GmbH
Chronological Simulation	Viewlogic
Computervision—GIS	Unisys
Control Data—Mechanical Software	ICEM Technologies
Foresight Resources	Softdesk
Generation 5 Technology	Geo/SQL Corporation
Gerber Systems (CAD portion)	Matra
Kork Systems	Autometric
LandCadd	Eagle Point
Logic Modeling Corp.	Synopsys
Massteck	OrCAD
Model Technology	Mentor Graphics
NeoCAD	Xilinx
PDA Engineering	MacNeal-Schwendler
Point Control	CAMAX Manufacturing
Racal-Redac	Zuken-Redac
Sunrise	Viewlogic
Syscan	Sysdeco Innovation

Source: Dataquest (September 1995)

Table 4
Companies Deleted from Database Since 1993

Region/Company	
North American	European
A.I. Systems	Aplein*
Apple Computer	Aucos elektronische
Aura CAD/CAM Systems	BATISOFT
CAE-link	CAD-Capture
Claris	CAD TECH Iberica*
Compact Software	CAMTEK
Control Data—Hardware	Caroline Informatique
Data General	Contract Data Research
ECOM Associates	Data Technology/DATECH*
Georgia Tech Research	Datagraphic
GEOVISION Inc.	DELTA CAD*
Infinite Graphics	EME

(Continued)

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Table 4
Companies Deleted from Database Since 1993 (Continued)

Region/Company	
North American (Continued)	European (Continued)
Innovative Data Design	FEA
Intrinsix	FEGS
Land Innovation	ItalCad
Maptech	Kreon
MC2 Engineering Software	Lamp Software
Moda CAD	Logic Systems Designers*
Phase Three Logic	Macao Systems
Synercom	MEDESIGN
Teradyne	Mucke Software
Understanding Systems	S.T.L.D.s.r.l.
Asian	Soft*
Kanematsu Semiconductor*	

*Distributors
Source: Dataquest (September 1995)

Table 5
Companies Added to Database Since 1993

Region/Company	
North American	European
3Soft	Abstract Hardware
Access Corp.	ACA Ltd.
ArcSys	Cimtel Ltd.
B.A. Intelligence Networks	Eigner + Partner GmbH
Boothroyd Dewhurst	HoSoft CAD
Cadis Software	Speed
CGTech	Spot Image Corp.
Chronology	ULTimate Technology
Cimplex	WiN Technology
Claritas/NPDC	
CMstat	
CSAR Corp.	
Database Applications Inc.	
Deneb Robotics	
DB Technology	
Design Acceleration	
Eagle Point	
EOSAT	
Equifax/NDS	
Fintronic	
Formtek	
Geographic Data Technology	
Gibbs and Assoc.	

(Continued)

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Table 5
Companies Added to Database Since 1993 (Continued)

Region/Company
North American (Continued)
Integrity Engineering
InterHDL
Intusoft
Livermore Software Tech. Corp.
Nextwave DA
NOVASOFT Systems
OEA International
Optem Engineering
Rebis (merger of EDA and ADev)
Sherpa Corp.
Simulation Technology
SRAC
Surfware
T D Technology
Tecnomatics Tech.
UniCAD
Variation Systems Analysis
Veritools
VISTA Environmental Inf.
Workgroup Tech

*Distributors
Source: Dataquest (September 1995)

Segmentation Definitions

This section lists the definitions specific to this document. The following paragraphs define the segments.

Applications

Mechanical

The mechanical segment refers to computer-aided tools used by engineers, designers, analysts, technicians, and draftspeople working predominantly in the discrete manufacturing industries, but includes government and education. Users of mechanical CAD/CAM/CAE tools work in all departments across the typical organization, with a majority found in product design, advanced engineering, and manufacturing engineering. Common design applications include conceptual design, industrial design, structural or thermal analysis, detail design, and electromechanical design (the mechanical part of design with electrical or electronic components and mechanisms). Common manufacturing applications include tool and fixture design, numerical control part programming, offline robotics programming, and interface to quality control systems. Management tools for database control and distribution are included in this segment, as well as user-defined application programming.

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Architecture, Engineering, and Construction (AEC)

The AEC segment covers the use of computer-aided tools by architects, contractors, plant engineers, civil engineers, and other people associated with these disciplines to aid in designing and managing buildings, industrial plants, ships, and other types of nondiscrete entities.

Geographic Information Systems (GIS)/Mapping

GIS is computer-based technology, and the segment comprises hardware, software, and data used to capture, edit, display, and analyze spatial (tagged by location) information.

Electronic Design Automation (EDA)

The EDA segment covers computer-based tools used to automate the design of an electronic product, including printed circuit boards, ICs, and systems. EDA includes ECAE, IC layout, and PCB/hybrid/MCM, as follows:

- Electronic computer-aided engineering (ECAE)—These are computer-aided tools used in the engineering or design phase of electronic products (as opposed to the physical layout phase of the product). Examples of electronic CAE applications are schematic capture and simulation.
- IC layout—This is a software application tool used to create and validate the physical implementation of an IC. The IC layout category comprises polygon editors, symbolic editors, placement and routing (gate array, cell, and block), and design verification tools (DRC/ERC/logic-to-layout).
- PCB/hybrid/MCM—This segment covers products used to create the placement and routing of the traces and components laid out on a printed circuit board. Also included in this category are thermal analysis tools.

Regions

The following paragraphs define the regions.

North America

North America includes the United States, Mexico, and Canada.

Europe

Europe includes the United Kingdom, Scandinavia, Benelux, France, Germany, Italy, Spain, and Rest of Europe.

Japan

Asia/Pacific

Asia includes Singapore, Taiwan, Korea, China, and Hong Kong.

Rest of World

Rest of World includes all other countries including Australia, New Zealand, India, Africa, Central America, South America, and the Middle East.

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Operating Systems

Dataquest defines the operating systems as follows:

- UNIX: UNIX includes all UNIX variants and older workstation operating systems.
- Host: Host includes minicomputer and mainframe operating systems in which the functions of external workstations are dependent on a host computer.
- Windows NT: Windows NT is the Microsoft operating system. We understand that code for Windows NT and Windows will be merged within the next three years. The probability is high that Microsoft will develop a client environment and a server environment. In our forecast, the future client environment is included in PC operating systems, and the future server environment is referenced as NT. Also included in NT is potential for an additional, new, high-end operating environment that could be developed by any vendor.
- PC: PC includes DOS, Windows, Windows 95, and Apple operating systems.

Metrics

The following paragraphs define measurements:

- Total factory revenue is defined as the amount of money received by a manufacturer for its goods and services measured in U.S. dollars. Total factory revenue does not include revenue that a company may receive from products that are sold to another company for resale (OEM revenue). Total factory revenue is the sum of software revenue, hardware revenue, and service revenue.
- Unit shipment is defined as the number of seats delivered (number of possible simultaneous users of product delivered) excluding OEM shipments.
- Hardware revenue is revenue derived from sales of CPUs (including operating systems), terminals (for host-dependent systems), and peripherals.
- Software revenue is revenue derived from the sale of application software that exists on a company's standard price list.
- Service revenue is defined as all revenue derived from the service and support of CAD/CAM/CAE/GIS systems. Service revenue can be calculated in the tables by subtracting hardware and software revenue from total revenue. A split by hardware service and software service is available through inquiry.
  - Maintenance fees for hardware and software
  - Management and operations services—help desk, education and training, disaster recovery, vaulting, and configuration management

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- Service bureau—project work, including construction of database, data conversion, product design, analysis, or manufacturing
- Application development—design and development of customized software applications or the modification, enhancement of customization of existing software applications, adding new functionality
- Consulting revenue—assessment of CAD/CAM/CAE/GIS business and information technology needs and the formulation of a plan based on needs identification
- Implementation and integration services—planning, implementation, migration, and integration of software products (software network support and integration, account integration management, data center design, and construction)

Market Share Methodology

Dataquest uses both primary and secondary sources to produce our market share data. In the fourth quarter of each year and second quarter of the subsequent year, we survey all participants in each industry. Each vendor is offered the opportunity to self-report the information required. Although there is a primary contact for each company, large companies are surveyed across product lines and across geographic regions. Thus there is a corresponding increase in the number of contacts at large companies. (Dataquest maintains a large contact database on all sources of information.) Examples of the job titles of people contacted for information are the following:

- President and CEO
- Vice president and general manager
- Vice president of marketing
- Vice president, strategic product planning
- Director of strategic planning
- Director of marketing
- Director of market development
- Manager, CAD/CAM/CAE/GIS marketing programs
- Market research analyst

The Audit Process

Data supplied by vendors is evaluated against information drawn from many sources, including the following:

- Revenue published by major industry participants
- Estimates made by knowledgeable and reliable industry spokespersons
- Government data or trade association data

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- Published product literature and price lists
- Interviews with knowledgeable manufacturers, distributors, and users
- Relevant economic data
- Information and data from online data banks
- Articles in both the general and trade press
- Annual reports, SEC documents, credit reports
- Company publications and press releases
- Reports from financial analysts
- User studies
- Reseller and supplier reports and reports from a vendor's competitors

Dataquest also sums vendor revenue across other industries covered by Dataquest to make sure that revenue is not credited twice, and checks with multiple sources at one company to cross-check data on that company.

Dataquest analysts have many years of experience in how to apply the tools described to get the most accurate information possible on a particular company (such as what to use when and what industry averages are). We believe that the estimates presented here are the most accurate and meaningful generally available today. It is the CAD/CAM/CAE/GIS group's policy to continually update our market information for any year, based on any new data received, in order to arrive at the most accurate market representation possible.

Dataquest's CAD/CAM/CAE/GIS market numbers are often higher than those reported by other sources. We survey worldwide, which involves more vendors, higher total market revenue, lower market share per vendor, and a more accurate market picture—which is particularly useful when comparing regions or applications.

Publishing Schedule

We publish market share and forecasting twice each year for each, allowing for both timely distribution of data and thorough analysis and forecasting. Our annual delivery schedule is as follows:

- Market share will be published and distributed to clients by March 31.
- Forecasting from the market share tables provides a five-year forecast period, available after April 30. The books will be shipped by May 31.
- Final updated market share tables, based on additional data collection and analysis, will be completed by June 30. At this point, the market share database is frozen and will not be changed until the end of the year. For the next six months, supplementary market data will be based on this final market data. Books will be shipped by July 31. (Unfortunately, because of our database changes, updated market share table delivery was delayed beyond this date.)

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- We provide complete final forecast tables by July 31. These tables take into consideration changes in the market share during the previous six months. Books will be shipped by September 31.

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Table A-1
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Germany Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	IBM	53.3	64.9	79.0	21.6	11.5
2	Siemens Nixdorf Info systeme	69.6	57.1	57.0	-0.2	8.3
3	Nemetschek	30.7	40.7	50.0	22.9	7.3
4	Autodesk	47.8	36.8	42.0	14.0	6.1
5	Dassault*	24.3	23.2	29.8	28.7	4.4
6	Hewlett-Packard	21.0	28.9	28.4	-1.5	4.2
7	Intergraph	30.8	26.0	26.7	2.8	3.9
8	Computervision	35.2	26.7	22.8	-14.6	3.3
9	IEZ	19.9	14.8	21.3	44.1	3.1
10	Straessle Informationssysteme	17.6	11.7	20.5	75.2	3.0
11	Matra Datavision	14.8	13.0	15.8	21.9	2.3
12	RIB/Bausoftware	5.4	10.7	15.4	43.8	2.2
13	Wiechers Datentechnik	12.0	16.5	15.1	-8.0	2.2
14	Parametric Technology	3.6	7.9	13.7	72.4	2.0
15	Ziegler Informatics	10.5	10.7	13.3	24.5	1.9
16	Cadence	18.7	12.1	12.9	6.9	1.9
17	EDS Unigraphics	9.1	10.2	12.2	20.2	1.8
18	Mentor Graphics	12.8	12.7	12.2	-4.2	1.8
19	PROCAD GmbH	3.7	3.4	12.1	254.7	1.8
20	ISD Software	9.2	9.0	10.8	20.9	1.6
21	ASCAD	7.7	8.0	10.6	31.9	1.5
22	Soft-Tech Software Technologies	8.3	8.7	9.6	11.4	1.4
23	Smallworld Systems	2.6	5.0	8.9	78.1	1.3
24	ESRI	5.2	4.7	8.7	85.0	1.3
25	Synopsys	4.5	7.8	8.4	7.5	1.2
26	Han Dataport	7.0	5.7	7.2	26.5	1.1
27	MacNeal-Schwendler	6.4	6.1	6.9	12.9	1.0
28	Applicon	11.3	7.8	6.8	-12.2	1.0
29	SDRC	6.7	6.2	6.2	0.7	0.9
30	Technische Computer Systeme	4.4	6.1	6.2	1.1	0.9
	Other Companies	30.8	34.2	37.8	10.4	5.5
	All N.A. Companies	294.6	284.1	310.6	9.3	45.4
	All European Companies	289.8	283.4	332.4	17.3	48.5
	All Asian Companies	9.7	5.1	4.1	-19.7	0.6
	All Companies	624.9	606.8	685.0	12.9	100.0

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-2
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Germany Software Companies, Mechanical, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	IBM	45.0	56.9	70.1	23.3	21.4
2	Dassault*	22.6	22.7	29.3	28.8	9.0
3	Hewlett-Packard	17.3	25.6	25.0	-2.7	7.6
4	Siemens Nixdorf Info systeme	27.8	23.6	22.3	-5.8	6.8
5	Computervision	29.7	23.6	21.4	-9.3	6.5
6	Autodesk	19.1	14.7	16.8	14.3	5.1
7	Matra Datavision	14.6	13.0	15.8	22.1	4.8
8	Straessle Informationssysteme	16.4	8.8	14.2	60.6	4.3
9	Parametric Technology	3.6	7.9	13.7	72.4	4.2
10	EDS Unigraphics	9.1	10.2	12.2	20.2	3.7
11	PROCAD GmbH	3.7	3.4	11.5	237.2	3.5
12	ASCAD	7.7	8.0	10.6	31.9	3.2
13	ISD Software	8.6	8.6	10.3	20.6	3.2
14	Intergraph	9.7	7.7	7.6	-0.9	2.3
15	Wiechers Datentechnik	7.0	7.2	7.4	3.1	2.3
16	Applicon	11.3	7.8	6.8	-12.2	2.1
17	MacNeal-Schwendler	6.3	5.9	6.3	5.7	1.9
18	SDRC	6.7	6.2	6.2	0.7	1.9
19	ICEM Technologies	5.9	3.1	4.1	33.6	1.3
20	Ziegler Informatics	4.2	4.3	4.0	-8.4	1.2
21	Tebis	5.4	3.4	3.4	-1.2	1.0
22	ADRA Systems	-	2.2	2.5	11.5	0.8
23	Ansys	2.3	2.1	2.3	9.1	0.7
24	Exapt	3.0	2.7	2.1	-19.9	0.7
25	debis Systemhaus	1.7	2.0	2.1	6.1	0.6
26	Altium*	4.3	2.6	2.0	-23.2	0.6
27	Han Dataport	1.9	1.6	2.0	26.1	0.6
28	Technische Computer Systeme	1.2	1.8	1.9	5.4	0.6
29	Marcus Computer Systeme	3.1	3.1	1.6	-48.9	0.5
30	Investronica SA	1.4	1.4	1.6	11.3	0.5
	Other Companies	8.5	8.6	10.2	18.1	3.1
	All N.A. Companies	173.2	178.8	196.0	9.6	59.9
	All European Companies	123.5	103.4	121.0	17.0	37.0
	All Asian Companies	-	-	-	NA	-
	All Companies	305.2	290.9	327.2	12.5	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-3
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Germany Software Companies, AEC, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Nemetschek	30.7	40.7	50.0	22.9	27.2
2	IEZ	19.9	14.8	21.3	44.1	11.6
3	Autodesk	20.5	15.8	18.3	15.6	10.0
4	Intergraph	13.2	11.6	12.4	6.6	6.7
5	RIB/Bausoftware	4.3	8.6	12.1	40.9	6.6
6	Soft-Tech Software Technologies	8.3	8.7	9.6	11.4	5.2
7	Siemens Nixdorf Info systeme	12.9	7.6	8.3	9.1	4.5
8	IBM	6.3	6.2	7.2	17.7	3.9
9	Ziegler Informatics	1.5	1.7	6.7	285.8	3.6
10	Han Dataport	5.1	4.2	5.3	26.6	2.9
11	Technische Computer Systeme	2.8	3.7	3.7	0.8	2.0
12	Complansoft CAD	2.5	3.1	3.4	10.0	1.9
13	Graphisoft Group	1.4	1.8	2.5	38.7	1.3
14	mb Programme	1.8	2.2	2.3	7.3	1.3
15	Hochtief	2.3	2.3	2.3	0.4	1.3
16	ACA Ltd.	2.1	2.3	2.3	0.5	1.2
17	Triplan	1.9	2.0	2.1	8.2	1.1
18	M.O.C.	3.2	3.4	1.6	-51.1	0.9
19	CAD Centre	1.1	1.2	1.6	37.3	0.9
20	Computervision	4.3	2.0	1.2	-40.4	0.7
21	Wiechers Datentechnik	4.4	1.0	1.1	5.8	0.6
22	Kockums Computer Systems	1.3	0.6	0.7	6.3	0.4
23	Sinus Software	0.8	0.6	0.7	10.2	0.4
24	Isicad	2.1	1.3	0.6	-56.4	0.3
25	Cadtronic*	1.5	1.6	0.6	-63.9	0.3
26	Dassault*	1.7	0.4	0.6	24.0	0.3
27	Altium*	0.6	0.6	0.5	-23.2	0.3
28	Sener Inginiera y Sistemaus	0.4	0.4	0.5	7.1	0.2
29	MOSS Systems Group	-	0.4	0.4	18.1	0.2
30	RoboCAD Solutions	0.4	0.4	0.3	-42.5	0.1
	Other Companies	4.3	4.5	4.5	0.5	2.4
	All N.A. Companies	47.2	37.5	40.2	7.3	21.9
	All European Companies	110.8	112.9	139.2	23.4	75.7
	All Asian Companies	-	-	-	NA	-
	All Companies	162.3	154.8	184.0	18.8	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-4
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Germany Software Companies, GIS/Mapping, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Siemens Nixdorf Info systeme	27.7	24.9	25.7	3.1	32.2
2	Smallworld Systems	2.6	5.0	8.9	78.1	11.1
3	ESRI	5.2	4.7	8.7	85.0	10.9
4	Straessle Informationssysteme	1.2	2.9	6.3	120.2	7.9
5	Intergraph	4.2	4.4	4.9	9.4	6.1
6	Autodesk	5.3	4.1	4.7	15.0	5.8
7	RIB/Bausoftware	1.1	2.2	3.3	55.4	4.2
8	Poppenhaeger Grips	1.9	2.6	2.7	3.3	3.4
9	Ziegler Informatics	1.3	1.4	2.1	54.5	2.7
10	MapInfo	-	0.7	1.3	85.5	1.7
11	IBM	1.1	1.2	1.1	-2.6	1.4
12	PCI Remote Sensing Corp	-	0.9	1.0	16.4	1.3
13	Ground Modelling Systems	0.2	0.4	0.8	90.2	1.0
14	GDS	0.4	0.4	0.5	27.5	0.6
15	ICL	0.4	0.5	0.5	-4.2	0.6
16	Triplan	0.4	0.4	0.4	-2.7	0.5
17	Star Informatic	-	0.2	0.2	-	0.3
18	UNISYS	-	-	0.2	NA	0.3
19	APIC Systemes	0.2	0.2	0.2	0.4	0.3
20	Strategic Mapping	-	0.1	0.2	18.8	0.2
21	Sysdeco Innovation	0.1	0.2	0.2	-	0.2
22	Clemessy Geocity	-	0.1	0.1	9.5	0.2
23	PAFEC	0.2	0.1	0.1	-	0.2
24	M.O.C.	0.2	0.2	0.1	-53.7	0.1
25	Laser-Scan	0	0.1	0.1	-28.9	0.1
26	Terr-Mar Resource Info Svs	-	0.1	0.1	-10.8	0.1
27	Geometria GIS Systems House	0.1	0	0	29.2	0
28	Computervision	0.4	0.6	-	-100.0	-
	Other Companies	4.0	4.4	5.4	23.2	6.8
	All N.A. Companies	16.5	17.2	22.7	32.2	28.5
	All European Companies	37.5	41.3	51.6	25.0	64.7
	All Asian Companies	-	-	-	NA	-
	All Companies	58.0	62.8	79.7	26.9	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-5
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Germany Software Companies, Electronic Design Automation, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Cadence	18.7	12.1	12.9	6.9	14.3
2	Mentor Graphics	12.8	12.7	12.2	-4.2	13.5
3	Synopsys	4.5	7.8	8.4	7.5	9.3
4	Wiechers Datentechnik	0.6	8.3	6.7	-19.4	7.4
5	Zuken-Redac	9.7	5.1	4.1	-19.7	4.6
6	Viewlogic Systems	2.5	3.4	4.0	18.6	4.5
7	Hewlett-Packard	3.7	3.2	3.5	7.9	3.8
8	Aucotec	2.9	3.7	2.7	-27.0	3.0
9	COMPASS Design Automation	1.6	2.6	2.6	-3.0	2.8
10	Autodesk	2.9	2.2	2.2	-1.2	2.4
11	CAD-UL	1.8	1.9	1.9	-1.8	2.1
12	Intergraph	3.7	2.3	1.9	-17.5	2.1
13	debis Systemhaus	1.7	1.8	1.8	1.1	2.0
14	ISDATA	1.4	1.3	1.2	-3.9	1.3
15	Sagantec	1.4	1.5	1.1	-22.0	1.3
16	Harris EDA	1.0	1.0	1.0	-2.0	1.1
17	Zycad	3.6	1.0	0.8	-15.2	0.9
18	Siemens Nixdorf Info systeme	1.1	1.0	0.8	-22.6	0.9
19	Kloeckner-Moeller	0.9	0.7	0.7	2.8	0.8
20	MacNeal-Schwendler	0.2	0.2	0.6	269.5	0.7
21	PROCAD GmbH	-	-	0.6	NA	0.7
22	Abstract Hardware	-	-	0.6	NA	0.6
23	Technische Computer Systeme	0.5	0.6	0.6	-9.8	0.6
24	Ziegler Informatics	3.6	3.2	0.5	-83.8	0.6
25	i-Logix	-	0.4	0.5	24.4	0.5
26	IBM	0.9	0.7	0.5	-37.8	0.5
27	Altium*	0.9	0.7	0.5	-37.8	0.5
28	PADS Software	-	0.4	0.4	3.1	0.4
29	ISKA	0.4	0.4	0.4	5.9	0.4
30	ULTImate Technology	0.3	0.3	0.3	20.1	0.4
	Other Companies	12.1	13.4	14.0	4.3	15.5
	All N.A. Companies	57.7	50.7	51.8	2.2	57.3
	All European Companies	18.0	25.8	20.5	-20.4	22.7
	All Asian Companies	9.7	5.1	4.1	-19.7	4.6
	All Companies	97.5	94.9	90.4	-4.8	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-6
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Germany Software Companies, Electronic CAE, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Synopsys	4.5	7.8	8.4	7.5	12.4
2	Mentor Graphics	8.2	8.1	7.3	-9.7	10.8
3	Cadence	11.0	6.7	7.1	6.1	10.4
4	Wiechers Datentechnik	0.6	8.3	6.7	-19.4	9.8
5	Viewlogic Systems	2.5	3.4	4.0	18.6	6.0
6	Hewlett-Packard	3.7	3.2	3.5	7.9	5.1
7	Aucotec	2.9	3.7	2.7	-27.0	3.9
8	Autodesk	2.9	2.2	2.2	-1.2	3.2
9	debis Systemhaus	1.7	1.8	1.8	1.1	2.7
10	COMPASS Design Automation	1.0	1.7	1.4	-16.2	2.1
11	ISDATA	1.4	1.3	1.2	-3.9	1.8
12	Intergraph	1.7	1.3	1.2	-8.8	1.7
13	Zycad	3.6	1.0	0.8	-15.2	1.2
14	Siemens Nixdorf Info systeme	1.1	1.0	0.8	-22.6	1.2
15	Kloeckner-Moeller	0.9	0.7	0.7	2.8	1.1
16	MacNeal-Schwendler	0.2	0.2	0.6	269.5	0.9
17	Zuken-Redac	2.8	1.1	0.6	-45.5	0.9
18	PROCAD GmbH	-	-	0.6	NA	0.9
19	Abstract Hardware	-	-	0.6	NA	0.8
20	Technische Computer Systeme	0.5	0.6	0.6	-9.8	0.8
21	i-Logix	-	0.4	0.5	24.4	0.7
22	Harris EDA	0.5	0.5	0.5	-	0.7
23	ISKA	0.4	0.4	0.4	5.9	0.5
24	ISD Software	0.4	0.3	0.3	27.6	0.5
25	Ziegler Informatics	2.1	1.7	0.3	-84.7	0.4
26	Sagantec	-	-	0.2	NA	0.3
27	3Soft	-	-	0.1	NA	0.1
28	ALS Design	-	-	0.1	NA	0.1
29	InterHDL	-	-	0	NA	0.1
30	Design Acceleration	-	-	0	NA	0.1
	Other Companies	11.8	12.6	12.8	1.5	18.8
	All N.A. Companies	39.9	36.4	37.7	3.4	55.5
	All European Companies	12.7	20.3	16.8	-16.9	24.8
	All Asian Companies	2.8	1.1	0.6	-45.5	0.9
	All Companies	67.2	70.4	67.9	-3.5	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-7
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Germany Software Companies, IC Layout, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Cadence	6.6	4.4	4.9	10.7	51.0
2	Mentor Graphics	1.0	1.3	1.8	41.9	18.7
3	COMPASS Design Automation	0.6	1.0	1.2	19.8	12.2
4	Sagantec	1.4	1.5	0.9	-37.6	9.5
5	Intergraph	0.1	0.2	0.1	-19.3	1.3
6	Summitt Design	0	0	0	3.6	0.2
7	Silicon Valley Research	0.8	0.1	-	-100.0	-
	Other Companies	0.3	0.4	0.7	66.0	7.1
	All N.A. Companies	9.1	6.9	7.9	15.0	83.4
	All European Companies	1.4	1.5	0.9	-37.6	9.5
	All Asian Companies	-	-	-	NA	-
	All Companies	10.7	8.8	9.5	8.7	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-8
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Germany Software Companies, PCB/MCM/Hybrid, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Zuken-Redac	6.9	4.0	3.5	-12.4	26.5
2	Mentor Graphics	3.6	3.3	3.1	-8.0	23.2
3	CAD-UL	1.8	1.9	1.9	-1.8	14.3
4	Cadence	1.1	1.0	1.0	-4.0	7.3
5	Intergraph	1.9	0.9	0.6	-30.0	4.6
6	Harris EDA	0.5	0.5	0.5	-3.9	3.7
7	IBM	0.9	0.7	0.5	-37.8	3.4
8	Altium*	0.9	0.7	0.5	-37.8	3.4
9	PADS Software	-	0.3	0.4	7.7	2.8
10	ULTImate Technology	0.3	0.3	0.3	20.1	2.5
11	Ziegler Informatics	1.5	1.5	0.3	-82.7	2.0
12	Norlinvest Ltd.	0.2	0.2	0.2	9.1	1.8
13	Computervision	0.7	0.5	0.2	-63.0	1.4
14	ALS Design	0.1	0.1	0	-85.5	0.1
	Other Companies	0.6	0.7	0.8	12.7	6.3
	All N.A. Companies	8.7	7.3	6.1	-15.9	46.4
	All European Companies	3.9	4.1	2.7	-32.1	20.8
	All Asian Companies	6.9	4.0	3.5	-12.4	26.5
	All Companies	20.2	16.1	13.2	-17.8	100.0

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-9
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Germany Software Companies, All Applications, UNIX

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	IBM	25.3	44.0	57.4	30.4	12.3
2	Siemens Nixdorf Info systeme	66.1	42.8	44.8	4.7	9.6
3	Hewlett-Packard	20.6	28.7	26.5	-7.7	5.7
4	Nemetschek	14.1	8.5	22.5	163.5	4.8
5	Dassault*	15.3	16.2	22.1	36.6	4.8
6	Computervision	33.6	25.6	21.7	-15.5	4.7
7	Straessle Informationssysteme	17.6	11.7	20.5	75.2	4.4
8	IEZ	19.9	14.8	20.2	36.5	4.3
9	Matra Datavision	14.5	12.8	15.5	21.3	3.3
10	Intergraph	25.9	18.3	13.9	-24.2	3.0
11	Cadence	18.3	12.1	12.9	6.9	2.8
12	Parametric Technology	3.6	7.6	12.3	62.5	2.6
13	EDS Unigraphics	9.1	8.4	12.2	45.0	2.6
14	Mentor Graphics	12.7	12.5	11.9	-4.5	2.6
15	PROCAD GmbH	3.7	3.4	10.9	219.6	2.3
16	ASCAD	7.5	7.8	10.0	28.8	2.2
17	Smallworld Systems	2.6	5.0	8.9	78.1	1.9
18	ISD Software	6.5	7.4	8.6	17.1	1.9
19	Synopsys	4.5	7.8	8.4	7.5	1.8
20	Han Dataport	6.0	4.8	7.2	50.4	1.6
21	Applicon	11.3	7.8	6.6	-15.0	1.4
22	SDRC	6.5	6.1	6.2	1.7	1.3
23	ESRI	4.2	3.4	6.0	80.0	1.3
24	Wiechers Datentechnik	5.9	5.3	4.6	-13.2	1.0
25	MacNeal-Schwendler	3.0	2.9	4.5	57.5	1.0
26	RIB/Bausoftware	1.5	2.2	4.2	94.1	0.9
27	ICEM Technologies	2.3	2.2	4.1	89.6	0.9
28	Zuken-Redac	8.1	4.2	4.0	-3.3	0.9
29	Technische Computer Systeme	3.5	3.5	3.7	6.6	0.8
30	Complansoft CAD	2.5	3.1	3.4	10.0	0.7
	Other Companies	21.6	27.3	30.0	10.1	6.5
	All N.A. Companies	205.1	205.8	218.1	6.0	46.8
	All European Companies	200.6	161.7	213.5	32.0	45.8
	All Asian Companies	8.1	4.2	4.0	-3.3	0.9
	All Companies	435.4	399.0	465.6	16.7	100.0

*Company statistics contain VAR/distributor revenue not counted in total
Source: Dataquest (August 1995)

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Table A-10
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Germany Software Companies, All Applications, NT/Hybrid

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Intergraph	-	0.2	6.2	3,548.5	58.8
2	Parametric Technology	-	-	1.4	NA	13.0
3	PROCAD GmbH	-	-	1.2	NA	11.4
4	IEZ	-	-	1.1	NA	10.7
5	ESRI	-	-	0.4	NA	3.7
6	Cadtronic*	-	-	0.4	NA	3.6
7	Mentor Graphics	-	-	0.1	NA	0.9
8	PCI Remote Sensing Corp	-	-	0.1	NA	0.5
9	Intusoft	-	-	0	NA	0.1
10	CAD Distribution	-	-	0	NA	0.1
11	EA Systems	-	-	0	NA	0.1
12	InterHDL	-	-	0	NA	0
	Other Companies	-	0	0.1	155.4	0.7
	All N.A. Companies	-	0.2	8.1	4,689.7	77.2
	All European Companies	-	-	2.3	NA	22.1
	All Asian Companies	-	-	-	NA	-
	All Companies	-	0.2	10.5	5,200.4	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-11
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Germany Software Companies, All Applications, Personal Computer

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Autodesk	44.9	34.6	39.5	14.0	21.7
2	Nemetschek	16.6	32.1	27.5	-14.4	15.1
3	Ziegler Informatics	10.5	10.7	13.3	24.5	7.3
4	RIB/Bausoftware	3.9	8.5	11.2	31.0	6.1
5	Wiechers Datentechnik	6.2	11.2	10.6	-5.6	5.8
6	Soft-Tech Software Technologies	8.3	8.7	9.6	11.4	5.3
7	Siemens Nixdorf Info systeme	-	8.3	9.6	16.4	5.3
8	Intergraph	4.9	7.2	6.7	-6.9	3.7
9	Tebis	5.4	3.4	3.0	-11.4	1.7
10	IBM	5.8	4.0	2.9	-25.9	1.6
11	Altium*	5.8	4.0	2.9	-25.9	1.6
12	Graphisoft Group	1.5	1.8	2.5	38.7	1.4
13	Technische Computer Systeme	1.0	2.7	2.5	-6.0	1.4
14	mb Programme	1.8	2.2	2.3	7.3	1.3
15	Hochtief	2.2	2.3	2.3	2.2	1.3
16	Viewlogic Systems	0.8	1.4	2.3	71.3	1.3
17	ACA Ltd.	1.8	2.1	2.3	9.3	1.2
18	ISD Software	2.7	1.6	2.2	38.5	1.2
19	Kloeckner-Moeller	2.3	2.1	2.1	-0.9	1.2
20	Hewlett-Packard	0.4	0.2	2.0	863.8	1.1
21	ESRI	1.0	1.1	1.9	69.3	1.0
22	Aucotec	2.3	2.7	1.7	-36.5	1.0
23	CAD-UL	1.4	1.5	1.6	4.7	0.9
24	Investronica SA	1.4	1.4	1.6	11.3	0.9
25	MapInfo	-	0.7	1.3	81.7	0.7
26	Computervision	1.3	1.1	1.1	5.4	0.6
27	Ground Modelling Systems	0.4	0.5	0.9	67.9	0.5
28	ISDATA	1.0	0.8	0.9	9.3	0.5
29	ADRA Systems	-	0.6	0.7	11.5	0.4
30	MCS	0.3	0.5	0.6	30.8	0.3
	Other Companies	7.6	6.0	7.2	21.0	4.0
	All N.A. Companies	61.3	54.4	62.3	14.4	34.3
	All European Companies	78.1	111.6	112.2	0.5	61.7
	All Asian Companies	1.6	1.0	0.1	-91.4	0
	All Companies	148.6	172.9	181.8	5.1	100.0

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-12
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Germany Software Companies, All Applications, Host/Proprietary

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	IBM	22.2	17.0	18.6	9.9	69.3
2	Dassault*	9.0	7.0	7.7	10.3	28.7
3	Siemens Nixdorf Info systeme	3.4	6.1	2.6	-57.3	9.6
4	MacNeal-Schwendler	3.4	3.2	2.4	-25.3	8.8
5	Exapt	2.2	1.9	1.4	-26.2	5.1
6	debis Systemhaus	0.4	0.4	0.4	-7.0	1.5
7	ESRI	0	0.2	0.4	64.0	1.5
8	GDS	0.9	0.7	0.4	-41.7	1.4
9	Ansys	0.5	0.4	0.2	-35.8	0.8
10	Mechanical Dynamics	-	0.1	0.1	18.0	0.5
11	PCI Remote Sensing Corp	-	0	0.1	16.4	0.2
12	Computational Mechanics	0.1	0	0	7.1	0.2
13	Harris EDA	0	0	0	-	0.1
14	Framasoft	-	0	0	75.2	0.1
15	EA Systems	-	0	0	-43.8	0
16	GRAFTEK	0	0	0	-11.1	0
17	EDS Unigraphics	-	1.7	-	-100.0	-
18	ICEM Technologies	3.5	0.9	-	-100.0	-
19	Han Dataport	0.5	0.4	-	-100.0	-
20	Intergraph	-	0.4	-	-100.0	-
21	ACA Ltd.	0.4	0.2	-	-100.0	-
22	ISDATA	0.1	0.1	-	-100.0	-
23	SDRC	0.2	0.1	-	-100.0	-
	Other Companies	1.6	0.7	0.2	-67.4	0.9
	All N.A. Companies	28.1	23.7	22.2	-6.4	82.6
	All European Companies	11.1	10.1	4.4	-55.9	16.5
	All Asian Companies	-	-	-	NA	-
	All Companies	40.8	34.5	26.9	-22.1	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table B-1
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Germany Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	3Soft	-	-	0.1	NA	0
2	Abstract Hardware	-	-	0.6	NA	0.1
3	ACA Ltd.	2.1	2.3	2.3	0.5	0.3
4	ADRA Systems	-	2.2	2.5	11.5	0.4
5	ALS Design	0.1	0.1	0.1	-41.5	0
6	Altium*	5.8	4.0	2.9	-25.9	0.4
7	Ansys	2.3	2.1	2.3	9.1	0.3
8	APIC Systemes	0.2	0.2	0.2	0.4	0
9	Applicon	11.3	7.8	6.8	-12.2	1.0
10	ASCAD	7.7	8.0	10.6	31.9	1.5
11	ASHLAR	0.1	0.2	0.5	190.3	0.1
12	Aucos elektronische Gerate	0.7	0.6	-	-100.0	-
13	Aucotec	2.9	3.7	2.7	-27.0	0.4
14	Autodesk	47.8	36.8	42.0	14.0	6.1
15	B.A.Intelligence Networks	0.1	0.2	0.4	56.7	0.1
16	BATISOFT	0.2	0.1	-	-100.0	-
17	CAD Centre	1.6	1.2	1.7	37.3	0.2
18	CAD Distribution	0.4	0.5	0.5	-1.6	0.1
19	CAD-UL	1.8	1.9	1.9	-1.8	0.3
20	Cadence	18.7	12.1	12.9	6.9	1.9
21	Cadtronic*	1.9	2.0	0.8	-60.0	0.1
22	CAMAX Manufacturing	-	0.2	0.5	190.6	0.1
23	CAMTEK	0.1	0.1	-	-100.0	-
24	Caroline Informatique	0	0	-	-100.0	-
25	CATALPA groupe Missler	-	-	0	NA	0
26	Cimatron	3.0	2.1	0.9	-54.3	0.1
27	CIMLINC	0.7	0.7	0.8	17.3	0.1
28	Cimplex	-	-	0	NA	0
29	Clemessy Geocity	-	0.1	0.1	9.5	0
30	COMPASS Design Automation	1.6	2.6	2.6	-3.0	0.4
31	Complansoft CAD	2.5	3.1	3.4	10.0	0.5
32	Computational Mechanics	0.1	0.2	0.2	14.2	0
33	Computervision	35.2	26.7	22.8	-14.6	3.3
34	Contec Microelectronics	-	0	0	10.0	0
35	Dassault*	24.3	23.2	29.8	28.7	4.4
36	Datagraphic	0	0	-	-100.0	-
37	debis Systemhaus	3.4	3.8	3.9	3.7	0.6

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Germany Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
38	Delcam International	1.9	0.4	0.5	3.3	0.1
39	Design Acceleration	-	-	0	NA	0
40	DP Technology	0.1	0.2	0.2	13.5	0
41	EA Systems	-	0	0	-10.0	0
42	EDS Unigraphics	9.1	10.2	12.2	20.2	1.8
43	Eigner + Partner	0.3	0.4	0.5	33.3	0.1
44	ESRI	5.2	4.7	8.7	85.0	1.3
45	Exapt	3.0	2.7	2.1	-19.9	0.3
46	FEGS	0.1	0	-	-100.0	-
47	Framasoft	-	0.1	0.2	111.6	0
48	GDS	1.2	0.9	0.7	-20.0	0.1
49	Geometria GIS Systems House	0.1	0	0	29.2	0
50	Gerber Systems	2.4	0.6	0.8	33.9	0.1
51	GRAFTEK	0	0	0	7.1	0
52	Graphisoft Group	1.5	1.8	2.5	38.7	0.4
53	Ground Modelling Systems	0.4	0.5	0.9	67.9	0.1
54	Han Dataport	7.0	5.7	7.2	26.5	1.1
55	Harris EDA	1.0	1.0	1.0	-2.0	0.1
56	Hewlett-Packard	21.0	28.9	28.4	-1.5	4.2
57	Hochtief	2.3	2.3	2.3	0.4	0.3
58	i-Logix	-	0.4	0.5	24.4	0.1
59	IBM	53.3	64.9	79.0	21.6	11.5
60	ICEM Technologies	5.9	3.1	4.1	33.6	0.6
61	ICL	0.7	0.7	0.7	-4.2	0.1
62	IEZ	19.9	14.8	21.3	44.1	3.1
63	Intergraph	30.8	26.0	26.7	2.8	3.9
64	InterHDL	-	-	0	NA	0
65	Intusoft	-	-	0	NA	0
66	Investronica SA	1.4	1.4	1.6	11.3	0.2
67	ISD Software	9.2	9.0	10.8	20.9	1.6
68	ISDATA	1.4	1.3	1.2	-3.9	0.2
69	Isicad	10.9	5.5	0.6	-89.3	0.1
70	ISKA	1.3	1.2	1.2	0.5	0.2
71	Kloeckner-Moeller	2.3	2.1	2.1	-0.9	0.3
72	Kockums Computer Systems	1.3	0.6	0.7	6.3	0.1
73	Kreon	0	0	-	-100.0	-
74	Lamp Software	0.1	0.1	-	-100.0	-

(Continued)

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Germany Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
75	Laser-Scan	0	0.1	0.1	-28.9	0
76	Livermore Software Tech.	0.1	0.1	0.1	48.6	0
77	M.O.C.	3.4	3.6	1.7	-51.2	0.3
78	MacNeal-Schwendler	6.4	6.1	6.9	12.9	1.0
79	MapInfo	-	0.7	1.3	85.5	0.2
80	Marcus Computer Systeme	3.1	3.1	1.6	-48.9	0.2
81	Matra Datavision	14.8	13.0	15.8	21.9	2.3
82	mb Programme	1.8	2.2	2.3	7.3	0.3
83	MCS	0.7	1.0	0.9	-7.9	0.1
84	Mechanical Dynamics	-	0.7	0.9	20.0	0.1
85	MEDesign	0.2	0.3	-	-100.0	-
86	Mentor Graphics	12.8	12.7	12.2	-4.2	1.8
87	MOSS Systems Group	-	0.4	0.4	18.1	0.1
88	Mucke Software	0.4	0.5	-	-100.0	-
89	Nemetschek	30.7	40.7	50.0	22.9	7.3
90	Norlinvest Ltd.	0.2	0.2	0.2	9.1	0
91	PADS Software	-	0.4	0.4	3.1	0.1
92	PAFEC	0.6	0.5	0.5	-2.1	0.1
93	Parametric Technology	3.6	7.9	13.7	72.4	2.0
94	Pathtrace Engineering Systems	0.1	0.1	0.1	-	0
95	PCI Remote Sensing Corp	-	0.9	1.0	16.4	0.2
96	Poppenhaeger Grips	1.9	2.6	2.7	3.3	0.4
97	PROCAD GmbH	3.7	3.4	12.1	254.7	1.8
98	Radan Computational	0.1	0.1	0.1	-	0
99	Rebis	-	-	0.2	NA	0
100	RIB/Bausoftware	5.4	10.7	15.4	43.8	2.2
101	RoboCAD Solutions	0.9	0.9	0.5	-42.5	0.1
102	Sagantec	1.4	1.5	1.1	-22.0	0.2
103	SDRC	6.7	6.2	6.2	0.7	0.9
104	Sener Inginiera y Sistemaus	0.4	0.4	0.5	7.1	0.1
105	Siemens Nixdorf Info systeme	69.6	57.1	57.0	-0.2	8.3
106	Silicon Valley Research	0.8	0.1	-	-100.0	-
107	Sinus Software	0.8	0.6	0.7	10.2	0.1
108	Smallworld Systems	2.6	5.0	8.9	78.1	1.3
109	Soft-Tech Software Technologies	8.3	8.7	9.6	11.4	1.4
110	Star Informatic	0.4	0.4	0.4	2.4	0.1
111	Straessle Informationssysteme	17.6	11.7	20.5	75.2	3.0

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Germany Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
112	Strategic Mapping	-	0.1	0.2	18.8	0
113	Summitt Design	0	0	0	3.6	0
114	Superdraft	0	0	0	-23.4	0
115	Synopsys	4.5	7.8	8.4	7.5	1.2
116	Sysdeco Innovation	0.1	0.2	0.2	-	0
117	Tebis	5.4	3.4	3.4	-1.2	0.5
118	Technische Computer Systeme	4.4	6.1	6.2	1.1	0.9
119	Terr-Mar Resource Info Svs	-	0.1	0.1	-10.8	0
120	Triplan	2.3	2.3	2.5	6.5	0.4
121	ULTImate Technology	0.3	0.3	0.3	20.1	0
122	UNISYS	-	-	0.2	NA	0
123	Vero International Software	-	0.1	0.2	45.3	0
124	Viewlogic Systems	2.5	3.4	4.0	18.6	0.6
125	Wiechers Datentechnik	12.0	16.5	15.1	-8.0	2.2
126	Ziegler Informatics	10.5	10.7	13.3	24.5	1.9
127	Zuken-Redac	9.7	5.1	4.1	-19.7	0.6
128	Zycad	3.6	1.0	0.8	-15.2	0.1
	Other Companies	30.8	34.2	37.8	10.4	5.5
	All N.A. Companies	294.6	284.1	310.6	9.3	45.4
	All European Companies	289.8	283.4	332.4	17.3	48.5
	All Asian Companies	9.7	5.1	4.1	-19.7	0.6
	All Companies	624.9	606.8	685.0	12.9	100.0

NA = Not applicable
*Company statistics contain VAR/distributor revenue not counted in total
Source: Dataquest (August 1995)

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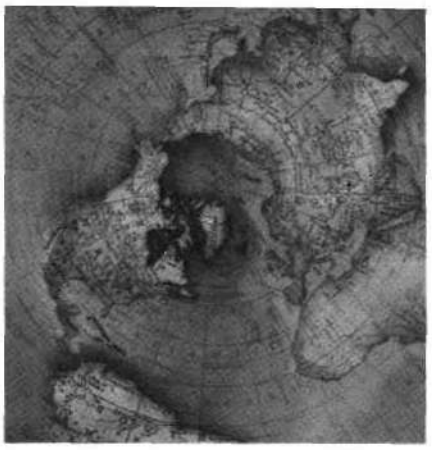
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1994 CAD/CAM/CAE/GIS France Market Share Update



Market Statistics

Program: CAD/CAM/CAE/GIS Europe
Product Code: CCAM-EU-MS-9505
Publication Date: September 25, 1995
Filing: Market Analysis

1994 CAD/CAM/CAE/GIS France Market Share Update



Market Statistics

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Note: All tables show estimated data.

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1994 CAD/CAM/CAE/GIS France Market Share Update

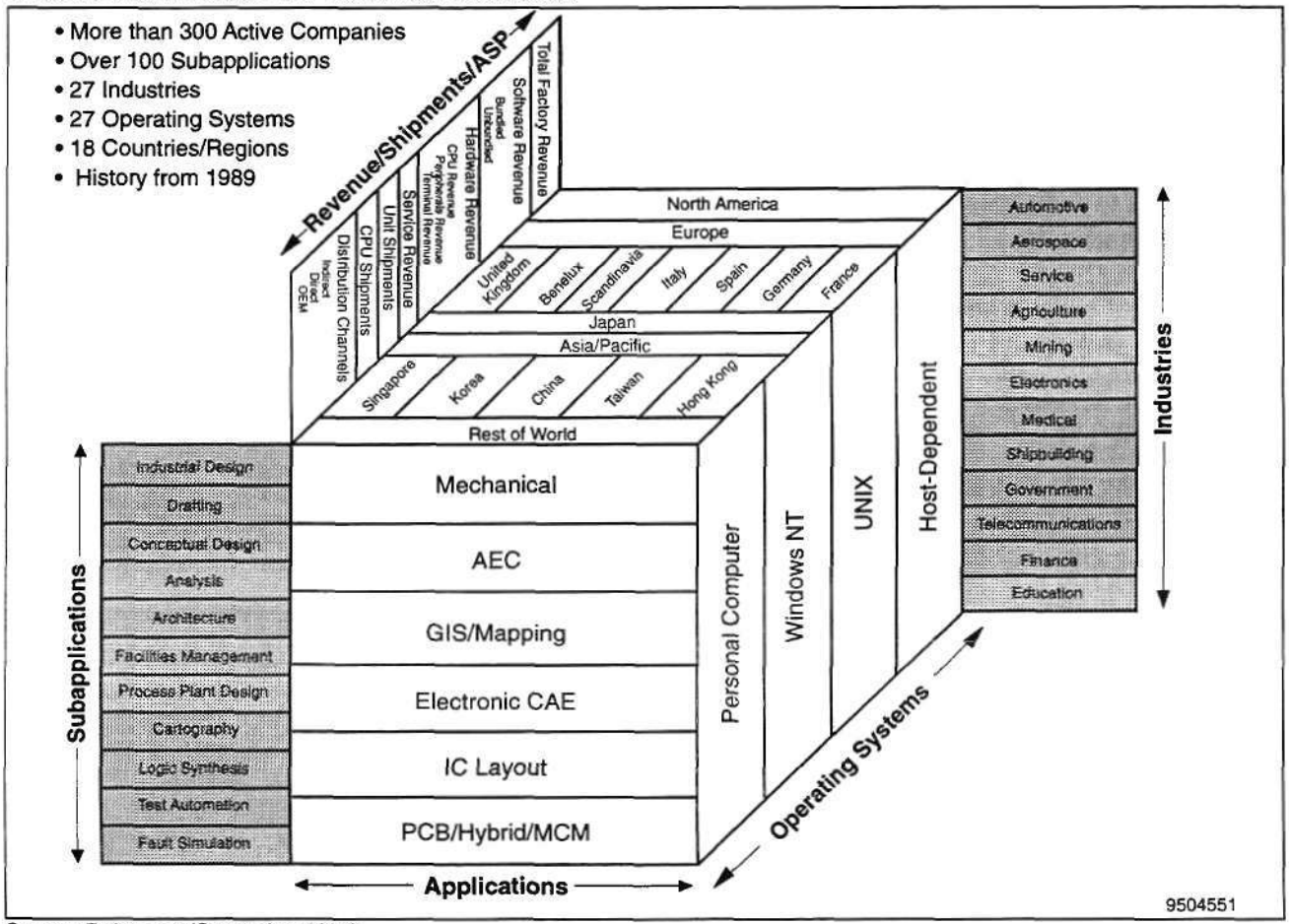
Introduction

CAD/CAM/CAE/GIS systems have dramatically changed the methods by which designers and production managers originate and implement products. CAD and CAE systems allow designers to create, draft, analyze, test, and manipulate products on a screen in two and three dimensions. As CAD/CAM/CAE/GIS systems continue to decrease in cost, they become more available and cost-justifiable to new users.

In order to provide a comprehensive view of the CAD/CAM/CAE/GIS industry, Dataquest's CAD/CAM/CAE/GIS group maintains a large database of industry information. The type of information contained in the database is depicted in Figure 1.

Table 1 summarizes the performance in various segments of the CAD/CAM/CAE/GIS markets in 1994 versus 1993.

Figure 1
CAD/CAM/CAE/GIS Market Database



Source: Dataquest (September 1995)

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Table 1
CAD/CAM/CAE/GIS Market Summary, 1993 to 1994

	Software Revenue		1993-1994	Total Factory Revenue		1993-1994	Seat Shipments		1993-1994
	1993	1994	Growth (%)	1993	1994	Growth (%)	1993	1994	Growth (%)
Applications									
Mechanical	2,248.9	2,455.5	9.2	7,374.9	7,968.8	8.1	279,480	298,442	6.8
AEC	752.3	849.0	12.9	2,204.7	2,401.1	8.9	198,114	211,550	6.8
GIS/Mapping	793.1	917.2	15.7	2,129.2	2,420.9	13.7	88,672	108,107	21.9
Electronic CAE	803.3	886.3	10.3	2,297.0	2,482.2	8.1	94,651	108,019	14.1
IC Layout	180.8	216.9	20.0	601.0	721.7	20.1	10,911	12,740	16.8
PCB/MCM/Hybrid	244.0	252.1	3.3	789.8	788.3	-0.2	29,042	27,766	-4.4
Electronic Design Automation	1,228.0	1,355.2	10.4	3,687.8	3,992.2	8.3	134,604	148,525	10.3
All Applications	5,022.3	5,577.0	11.0	15,396.6	16,782.9	9.0	700,869	766,623	9.4
Region									
North America	1,856.7	2,045.6	10.2	5,614.9	6,189.1	10.2	312,240	343,290	9.9
Europe	1,660.3	1,864.4	12.3	5,272.8	5,750.2	9.1	237,945	258,480	8.6
Japan	1,203.4	1,315.8	9.3	3,728.1	3,909.9	4.9	99,963	102,239	2.3
Asia/Pacific	208.0	255.4	22.8	538.2	676.9	25.8	33,753	44,643	32.3
Rest of World	93.9	95.8	2.0	242.6	256.9	5.9	16,968	17,971	5.9
Worldwide	5,022.3	5,577.0	11.0	15,396.6	16,782.9	9.0	700,869	766,623	9.4
Operating System									
UNIX	3,466.6	3,874.3	11.8	10,861.7	11,946.9	10.0	192,244	221,152	15.0
Host	301.4	197.9	-34.3	1,616.0	1,269.4	-21.5	27,091	21,566	-20.4
Windows NT	5.5	106.4	1,845.3	10.3	282.7	2,644.1	226	6,764	2,892.9
PC	1,248.9	1,398.3	12.0	2,908.5	3,283.9	12.9	481,308	517,141	7.4
All Operating Systems	5,022.3	5,577.0	11.0	15,396.6	16,782.9	9.0	700,869	766,623	9.4

Note: This table includes software content (data) companies for GIS/mapping. However, the AEC and GIS market share book (*1994 CAD/CAM/CAE/GIS AEC and GIS Market Share*, CAEC-WW-MS-9501) does not.
Source: Dataquest (September 1995)

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About This Document

This document contains Dataquest's detailed market share information on the CAD/CAM/CAE/GIS industry. The following list contains descriptions of the companies included in the Market Share books. See Tables 2, 3, 4, and 5 for changes from our 1993 report.

- Mechanical applications—All companies in database with mechanical revenue
- GIS and AEC applications—All companies in database with GIS revenue and all companies in database with AEC revenue. We also have added GIS data companies.
- Electronic design automation applications—All companies in database with EDA (electronic CAE, IC layout, PCB/hybrid/MCM) revenue
- Europe overview—All companies with European revenue
- Asia—All companies with Asian revenue

We no longer publish top-level market statistics for the entire CAD/CAM/CAE/GIS industry. This data is available by calling Suzanne Snygg at (408) 468-8124. More detailed data on these markets may be requested through our client inquiry service.

We no longer publish data by hardware platform; instead we report by four major operating systems: UNIX, host, Windows NT, and PC.

This document represents our final estimates of 1994 shipments and revenue.

Dataquest's policy is to continually update its market information, for current and past years, with any new data received in order to arrive at the most accurate market representation possible.

Table 2
Companies Renamed Since 1993

Original Company Name	New Company Name
ACDS Graphic System	Geomax International
Genrad	VEDA
GeoVision	SHL Systemhouse
Graphisoft Software Dev	Graphisoft Group
ICAD	Concentra
Kohns & Poppenhaeger	Poppenhaeger Grips GmbH
Microway	M.O.C.
Scientific & Engineering Software	SES Inc.
Silvar-Lisco	SVRI (Silicon Valley Research Inc.)
Smallworld Systems	SmallworldWide
Swanson Analysis	Ansys
Tactics International	Tactician Corporation

Source: Dataquest (September 1995)

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Table 3
Companies (or CAD Portions of Companies) Sold/Merged in 1994

Company Name	Acquired by/Merged with
Aries Technology	MacNeal-Schwendler
ANACAD-EES	Mentor Graphics
Betronex & Visionics	Norlinvest Ltd.
Cisigraph	Matra
Digital—Mechanical Software	PROCAD GmbH
Chronological Simulation	Viewlogic
Computervision—GIS	Unisys
Control Data—Mechanical Software	ICEM Technologies
Foresight Resources	Softdesk
Generation 5 Technology	Geo/SQL Corporation
Gerber Systems (CAD portion)	Matra
Kork Systems	Autometric
LandCadd	Eagle Point
Logic Modeling Corp.	Synopsys
Massteck	OrCAD
Model Technology	Mentor Graphics
NeoCAD	Xilinx
PDA Engineering	MacNeal-Schwendler
Point Control	CAMAX Manufacturing
Racal-Redac	Zuken-Redac
Sunrise	Viewlogic
Syscan	Sysdeco Innovation

Source: Dataquest (September 1995)

Table 4
Companies Deleted from Database Since 1993

Region/Company	
North American	European
A.I. Systems	Aplein*
Apple Computer	Aucos elektronische
Aura CAD/CAM Systems	BATISOFT
CAE-link	CAD-Capture
Claris	CAD TECH Iberica*
Compact Software	CAMTEK
Control Data—Hardware	Caroline Informatique
Data General	Contract Data Research
ECOM Associates	Data Technology/DATECH*
Georgia Tech Research	Datagraphic
GEOVISION Inc.	DELTA CAD*
Infinite Graphics	EME

(Continued)

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Table 4
Companies Deleted from Database Since 1993 (Continued)

Region/Company	
North American (Continued)	European (Continued)
Innovative Data Design	FEA
Intrinsix	FEGS
Land Innovation	ItalCad
Maptech	Kreon
MC2 Engineering Software	Lamp Software
Moda CAD	Logic Systems Designers*
Phase Three Logic	Macao Systems
Synercom	MEDESIGN
Teradyne	Mucke Software
Understanding Systems	S.T.L.D.s.r.l.
Asian	Soft*
Kanematsu Semiconductor*	

*Distributors
Source: Dataquest (September 1995)

Table 5
Companies Added to Database Since 1993

Region/Company	
North American	European
3Soft	Abstract Hardware
Access Corp.	ACA Ltd.
ArcSys	Cimtel Ltd.
B.A. Intelligence Networks	Eigner + Partner GmbH
Boothroyd Dewhurst	HoSoft CAD
Cadis Software	Speed
CGTech	Spot Image Corp.
Chronology	ULTimate Technology
Cimplex	WiN Technology
Claritas/NPDC	
CMstat	
CSAR Corp.	
Database Applications Inc.	
Deneb Robotics	
DB Technology	
Design Acceleration	
Eagle Point	
EOSAT	
Equifax/NDS	
Fintronic	
Formtek	
Geographic Data Technology	
Gibbs and Assoc.	

(Continued)

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Table 5
Companies Added to Database Since 1993 (Continued)

Region/Company
North American (Continued)
Integrity Engineering
InterHDL
Intusoft
Livermore Software Tech. Corp.
Nextwave DA
NOVASOFT Systems
OEA International
Optem Engineering
Rebis (merger of EDA and ADev)
Sherpa Corp.
Simulation Technology
SRAC
Surfware
T D Technology
Tecnomatics Tech.
UniCAD
Variation Systems Analysis
Veritools
VISTA Environmental Inf.
Workgroup Tech

*Distributors
Source: Dataquest (September 1995)

Segmentation Definitions

This section lists the definitions specific to this document. The following paragraphs define the segments.

Applications

Mechanical

The mechanical segment refers to computer-aided tools used by engineers, designers, analysts, technicians, and draftspeople working predominantly in the discrete manufacturing industries, but includes government and education. Users of mechanical CAD/CAM/CAE tools work in all departments across the typical organization, with a majority found in product design, advanced engineering, and manufacturing engineering. Common design applications include conceptual design, industrial design, structural or thermal analysis, detail design, and electromechanical design (the mechanical part of design with electrical or electronic components and mechanisms). Common manufacturing applications include tool and fixture design, numerical control part programming, offline robotics programming, and interface to quality control systems. Management tools for database control and distribution are included in this segment, as well as user-defined application programming.

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Architecture, Engineering, and Construction (AEC)

The AEC segment covers the use of computer-aided tools by architects, contractors, plant engineers, civil engineers, and other people associated with these disciplines to aid in designing and managing buildings, industrial plants, ships, and other types of nondiscrete entities.

Geographic Information Systems (GIS)/Mapping

GIS is computer-based technology, and the segment comprises hardware, software, and data used to capture, edit, display, and analyze spatial (tagged by location) information.

Electronic Design Automation (EDA)

The EDA segment covers computer-based tools used to automate the design of an electronic product, including printed circuit boards, ICs, and systems. EDA includes ECAE, IC layout, and PCB/hybrid/MCM, as follows:

- Electronic computer-aided engineering (ECAE)—These are computer-aided tools used in the engineering or design phase of electronic products (as opposed to the physical layout phase of the product). Examples of electronic CAE applications are schematic capture and simulation.
- IC layout—This is a software application tool used to create and validate the physical implementation of an IC. The IC layout category comprises polygon editors, symbolic editors, placement and routing (gate array, cell, and block), and design verification tools (DRC/ERC/logic-to-layout).
- PCB/hybrid/MCM—This segment covers products used to create the placement and routing of the traces and components laid out on a printed circuit board. Also included in this category are thermal analysis tools.

Regions

The following paragraphs define the regions.

North America

North America includes the United States, Mexico, and Canada.

Europe

Europe includes the United Kingdom, Scandinavia, Benelux, France, Germany, Italy, Spain, and Rest of Europe.

Japan

Asia/Pacific

Asia includes Singapore, Taiwan, Korea, China, and Hong Kong.

Rest of World

Rest of World includes all other countries including Australia, New Zealand, India, Africa, Central America, South America, and the Middle East.

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Operating Systems

Dataquest defines the operating systems as follows:

- UNIX: UNIX includes all UNIX variants and older workstation operating systems.
- Host: Host includes minicomputer and mainframe operating systems in which the functions of external workstations are dependent on a host computer.
- Windows NT: Windows NT is the Microsoft operating system. We understand that code for Windows NT and Windows will be merged within the next three years. The probability is high that Microsoft will develop a client environment and a server environment. In our forecast, the future client environment is included in PC operating systems, and the future server environment is referenced as NT. Also included in NT is potential for an additional, new, high-end operating environment that could be developed by any vendor.
- PC: PC includes DOS, Windows, Windows 95, and Apple operating systems.

Metrics

The following paragraphs define measurements:

- Total factory revenue is defined as the amount of money received by a manufacturer for its goods and services measured in U.S. dollars. Total factory revenue does not include revenue that a company may receive from products that are sold to another company for resale (OEM revenue). Total factory revenue is the sum of software revenue, hardware revenue, and service revenue.
- Unit shipment is defined as the number of seats delivered (number of possible simultaneous users of product delivered) excluding OEM shipments.
- Hardware revenue is revenue derived from sales of CPUs (including operating systems), terminals (for host-dependent systems), and peripherals.
- Software revenue is revenue derived from the sale of application software that exists on a company's standard price list.
- Service revenue is defined as all revenue derived from the service and support of CAD/CAM/CAE/GIS systems. Service revenue can be calculated in the tables by subtracting hardware and software revenue from total revenue. A split by hardware service and software service is available through inquiry.
  - Maintenance fees for hardware and software
  - Management and operations services—help desk, education and training, disaster recovery, vaulting, and configuration management

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- Service bureau—project work, including construction of database, data conversion, product design, analysis, or manufacturing
- Application development—design and development of customized software applications or the modification, enhancement of customization of existing software applications, adding new functionality
- Consulting revenue—assessment of CAD/CAM/CAE/GIS business and information technology needs and the formulation of a plan based on needs identification
- Implementation and integration services—planning, implementation, migration, and integration of software products (software network support and integration, account integration management, data center design, and construction)

Market Share Methodology

Dataquest uses both primary and secondary sources to produce our market share data. In the fourth quarter of each year and second quarter of the subsequent year, we survey all participants in each industry. Each vendor is offered the opportunity to self-report the information required. Although there is a primary contact for each company, large companies are surveyed across product lines and across geographic regions. Thus there is a corresponding increase in the number of contacts at large companies. (Dataquest maintains a large contact database on all sources of information.) Examples of the job titles of people contacted for information are the following:

- President and CEO
- Vice president and general manager
- Vice president of marketing
- Vice president, strategic product planning
- Director of strategic planning
- Director of marketing
- Director of market development
- Manager, CAD/CAM/CAE/GIS marketing programs
- Market research analyst

The Audit Process

Data supplied by vendors is evaluated against information drawn from many sources, including the following:

- Revenue published by major industry participants
- Estimates made by knowledgeable and reliable industry spokespersons
- Government data or trade association data

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- Published product literature and price lists
- Interviews with knowledgeable manufacturers, distributors, and users
- Relevant economic data
- Information and data from online data banks
- Articles in both the general and trade press
- Annual reports, SEC documents, credit reports
- Company publications and press releases
- Reports from financial analysts
- User studies
- Reseller and supplier reports and reports from a vendor's competitors

Dataquest also sums vendor revenue across other industries covered by Dataquest to make sure that revenue is not credited twice, and checks with multiple sources at one company to cross-check data on that company.

Dataquest analysts have many years of experience in how to apply the tools described to get the most accurate information possible on a particular company (such as what to use when and what industry averages are). We believe that the estimates presented here are the most accurate and meaningful generally available today. It is the CAD/CAM/CAE/GIS group's policy to continually update our market information for any year, based on any new data received, in order to arrive at the most accurate market representation possible.

Dataquest's CAD/CAM/CAE/GIS market numbers are often higher than those reported by other sources. We survey worldwide, which involves more vendors, higher total market revenue, lower market share per vendor, and a more accurate market picture—which is particularly useful when comparing regions or applications.

Publishing Schedule

We publish market share and forecasting twice each year for each, allowing for both timely distribution of data and thorough analysis and forecasting. Our annual delivery schedule is as follows:

- Market share will be published and distributed to clients by March 31.
- Forecasting from the market share tables provides a five-year forecast period, available after April 30. The books will be shipped by May 31.
- Final updated market share tables, based on additional data collection and analysis, will be completed by June 30. At this point, the market share database is frozen and will not be changed until the end of the year. For the next six months, supplementary market data will be based on this final market data. Books will be shipped by July 31. (Unfortunately, because of our database changes, updated market share table delivery was delayed beyond this date.)

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- We provide complete final forecast tables by July 31. These tables take into consideration changes in the market share during the previous six months. Books will be shipped by September 31.

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Table A-1
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 France Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	IBM	26.9	27.1	37.5	38.6	13.5
2	Matra Datavision	29.1	29.8	34.7	16.4	12.5
3	Dassault*	41.7	33.7	31.4	-6.7	11.3
4	Computervision	30.6	21.8	23.3	6.7	8.4
5	Autodesk	18.6	19.7	22.5	14.0	8.1
6	Intergraph	13.7	15.4	16.3	5.8	5.9
7	Parametric Technology	4.5	9.2	15.9	72.4	5.7
8	Cadence	13.4	8.7	9.3	6.9	3.3
9	Mentor Graphics	6.3	4.3	7.6	77.3	2.7
10	Serbi	6.3	6.1	6.8	10.7	2.4
11	COMPASS Design Automation	3.7	5.8	5.6	-3.0	2.0
12	Viewlogic Systems	2.0	3.7	5.5	48.4	2.0
13	Hewlett-Packard	6.1	5.3	5.3	-0.5	1.9
14	SDRC	4.7	4.5	5.3	17.5	1.9
15	ESRI	3.2	4.6	4.8	6.2	1.7
16	EDS Unigraphics	4.0	4.5	4.8	5.1	1.7
17	MacNeal-Schwendler	2.7	5.7	4.2	-27.2	1.5
18	Framasoft	3.2	3.5	3.8	8.0	1.4
19	Zycad	1.4	1.6	3.7	125.2	1.3
20	APIC Systemes	1.6	2.0	2.5	24.9	0.9
21	Synopsys	1.2	2.2	2.4	7.5	0.9
22	Norlinvest Ltd.	1.6	2.1	2.2	5.2	0.8
23	Assigraph	2.3	2.3	2.2	-2.2	0.8
24	ALS Design	1.8	1.8	2.1	13.2	0.8
25	Star Informatic	3.3	1.9	2.1	11.3	0.7
26	ACA Ltd.	1.8	1.8	1.8	0.5	0.7
27	Applicon	3.0	1.9	1.7	-12.2	0.6
28	Ansys	1.7	1.5	1.6	9.1	0.6
29	ICL	1.4	1.4	1.6	10.4	0.6
30	Zuken-Redac	3.2	1.7	1.4	-20.3	0.5
	Other Companies	15.5	17.8	21.7	21.6	7.8
	All N.A. Companies	151.1	153.1	184.0	20.2	66.3
	All European Companies	68.7	65.4	70.6	8.0	25.4
	All Asian Companies	3.2	1.7	1.4	-20.3	0.5
	All Companies	238.5	238.0	277.6	16.7	100.0

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-2
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 France Software Companies, Mechanical, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Matra Datavision	28.9	29.6	34.7	17.2	21.7
2	IBM	24.6	23.9	33.6	40.4	21.0
3	Dassault*	38.8	33.0	30.8	-6.6	19.3
4	Computervision	25.8	20.0	21.9	9.6	13.7
5	Parametric Technology	4.5	9.2	15.9	72.4	9.9
6	Autodesk	7.4	7.9	9.0	14.3	5.6
7	SDRC	4.7	4.5	5.3	17.5	3.3
8	Serbi	4.3	4.5	5.0	12.0	3.1
9	EDS Unigraphics	4.0	4.5	4.8	5.1	3.0
10	Hewlett-Packard	5.1	4.2	4.1	-2.7	2.6
11	MacNeal-Schwendler	2.7	5.6	3.9	-30.8	2.4
12	Framasoft	3.2	3.5	3.8	8.0	2.4
13	Intergraph	2.3	1.8	1.8	-0.9	1.1
14	Applicon	3.0	1.9	1.7	-12.2	1.1
15	Ansys	1.7	1.5	1.6	9.1	1.0
16	ADRA Systems	-	1.0	1.1	11.5	0.7
17	CATALPA groupe Missler	1.2	1.1	1.0	-4.9	0.6
18	Altium*	1.8	1.1	0.8	-24.0	0.5
19	Investronica SA	0.3	0.3	0.8	133.3	0.5
20	ICEM Technologies	0.5	0.1	0.7	939.7	0.4
21	CAD Lab	0.5	0.5	0.6	34.9	0.4
22	ICL	0.6	0.6	0.5	-8.6	0.3
23	Mechanical Dynamics	-	0.4	0.4	20.0	0.3
24	PAFEC	0.3	0.3	0.3	-3.7	0.2
25	B.A.Intelligence Networks	0.1	0.2	0.2	56.7	0.2
26	ASHLAR	0	0.1	0.2	161.3	0.1
27	Superdraft	0.1	0.1	0.2	46.9	0.1
28	RoboCAD Solutions	0.2	0.2	0.2	13.1	0.1
29	CAMAX Manufacturing	-	0.1	0.2	190.6	0.1
30	CIMLINC	0.1	0.1	0.1	17.3	0.1
	Other Companies	4.2	4.2	5.4	29.5	3.4
	All N.A. Companies	86.2	87.6	106.4	21.5	66.4
	All European Companies	44.2	43.2	48.4	12.1	30.2
	All Asian Companies	-	-	-	NA	-
	All Companies	134.7	134.9	160.2	18.7	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-3
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 France Software Companies, AEC, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Autodesk	8.0	8.5	9.8	15.6	31.5
2	Intergraph	4.4	3.9	4.1	6.6	13.2
3	IBM	1.8	2.6	3.4	30.7	10.9
4	Assigraph	2.3	2.3	2.2	-2.2	7.1
5	ACA Ltd.	1.8	1.8	1.8	0.5	5.8
6	Computervision	3.7	1.5	1.4	-7.3	4.5
7	Nemetschek	-	0.4	1.2	164.3	3.7
8	Serbi	1.0	0.8	1.0	14.3	3.1
9	CAD Centre	0.5	0.6	0.9	37.3	2.8
10	Graphisoft Group	0.6	0.6	0.9	40.8	2.8
11	Star Informatic	1.6	0.8	0.8	3.7	2.7
12	Dassault*	2.9	0.6	0.6	-10.0	1.9
13	IEZ	-	-	0.4	NA	1.3
14	GDS	0.2	0.4	0.2	-42.6	0.7
15	RoboCAD Solutions	0.1	0.2	0.2	13.1	0.6
16	Rebis	-	-	0.2	NA	0.6
17	Han Dataport	0.1	0.1	0.1	27.4	0.5
18	Altium*	0.2	0.3	0.1	-50.8	0.4
19	Ziegler Informatics	0	0	0.1	212.4	0.4
20	Kockums Computer Systems	0.2	0.1	0.1	-	0.3
21	MOSS Systems Group	-	0.1	0.1	18.1	0.3
22	ASHLAR	-	0	0	451.7	0.2
23	EA Systems	-	0	0	-10.0	0.1
24	PAFEC	0	0	0	-	0.1
25	ISD Software	-	0	0	27.6	0
26	Datagraphic	1.3	1.3	-	-100.0	-
27	BATISOFT	2.3	1.0	-	-100.0	-
28	Macao Systems	0.5	0.4	-	-100.0	-
29	Matra Datavision	0.2	0.2	-	-100.0	-
	Other Companies	1.7	2.0	2.1	6.6	6.9
	All N.A. Companies	18.1	16.8	19.2	13.8	61.6
	All European Companies	12.7	10.7	9.8	-8.8	31.5
	All Asian Companies	-	-	-	NA	-
	All Companies	32.5	29.6	31.1	5.1	100.0

NA = Not applicable
*Company statistics contain VAR/distributor revenue not counted in total
Source: Dataquest (August 1995)

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Table A-4
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 France Software Companies, GIS/Mapping, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Intergraph	5.4	8.8	9.6	9.4	32.8
2	ESRI	3.2	4.6	4.8	6.2	16.5
3	APIC Systemes	1.6	2.0	2.5	24.9	8.6
4	Autodesk	2.0	2.2	2.5	15.0	8.5
5	ICL	0.8	0.9	1.1	23.3	3.6
6	Star Informatic	1.7	0.8	1.0	22.6	3.5
7	Clemessy Geocity	0.8	0.7	0.8	9.5	2.7
8	UNISYS	0.3	0.4	0.6	53.7	2.0
9	Siemens Nixdorf Info systeme	0.6	0.6	0.6	3.1	1.9
10	GDS	0.4	0.3	0.5	60.5	1.7
11	PCI Remote Sensing Corp	-	0.3	0.3	16.4	1.2
12	IBM	0.2	0.2	0.2	-2.6	0.7
13	PAFEC	0.1	0.1	0.1	27.3	0.5
14	Laser-Scan	0	-	0.1	NA	0.2
15	Ziegler Informatics	0	0	0	-20.0	0.1
16	Sysdeco Innovation	0	0	0	-	0.1
17	Computervision	0.3	0.3	-	-100.0	-
18	EME	0.2	0.3	-	-100.0	-
	Other Companies	2.9	4.4	4.4	1.6	15.2
	All N.A. Companies	12.0	17.0	18.6	9.0	63.5
	All European Companies	6.0	5.4	6.2	14.5	21.3
	All Asian Companies	-	-	-	NA	-
	All Companies	20.9	26.9	29.3	8.9	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-5
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 France Software Companies, Electronic Design Automation, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Cadence	13.4	8.7	9.3	6.9	16.0
2	Mentor Graphics	6.3	4.3	7.6	77.3	13.2
3	COMPASS Design Automation	3.7	5.8	5.6	-3.0	9.8
4	Viewlogic Systems	2.0	3.7	5.5	48.4	9.5
5	Zycad	1.4	1.6	3.7	125.2	6.4
6	Synopsys	1.2	2.2	2.4	7.5	4.2
7	Norlinvest Ltd.	1.6	2.1	2.2	5.2	3.8
8	ALS Design	1.8	1.8	2.1	13.2	3.6
9	Zuken-Redac	3.2	1.7	1.4	-20.3	2.4
10	Harris EDA	1.4	1.3	1.3	0.8	2.2
11	Autodesk	1.1	1.2	1.2	-1.2	2.0
12	Hewlett-Packard	1.0	1.1	1.2	7.9	2.0
13	Intergraph	1.6	1.0	0.8	-17.5	1.4
14	Serbi	1.0	0.8	0.8	-	1.4
15	Sagantec	0.3	0.4	0.5	29.9	0.8
16	IBM	0.4	0.3	0.3	-1.7	0.5
17	Altium*	0.4	0.3	0.3	-1.7	0.5
18	3Soft	-	-	0.3	NA	0.5
19	MacNeal-Schwendler	0.1	0.1	0.3	203.3	0.5
20	Wiechers Datentechnik	-	0.1	0.2	120.6	0.4
21	Star Informatic	-	0.2	0.2	-4.8	0.3
22	VLSI Libraries	-	-	0.2	NA	0.3
23	i-Logix	-	0.1	0.1	3.7	0.2
24	PADS Software	-	0.1	0.1	-19.2	0.2
25	ISDATA	0.1	0.1	0	-5.2	0.1
26	Design Acceleration	-	-	0	NA	0.1
27	ULTImate Technology	0	0	0	86.8	0.1
28	Contec Microelectronics	-	0	0	10.0	0.1
29	Intusoft	-	-	0	NA	0
30	Silicon Valley Research	0.4	0.1	0	-77.9	0
	Other Companies	7.0	7.8	10.3	32.7	17.9
	All N.A. Companies	34.8	31.6	39.9	26.1	69.1
	All European Companies	5.8	6.0	6.1	2.1	10.6
	All Asian Companies	3.2	1.7	1.4	-20.3	2.4
	All Companies	50.7	47.2	57.7	22.4	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-6
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 France Software Companies, Electronic CAE, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Viewlogic Systems	2.0	3.7	5.5	48.4	13.4
2	Cadence	7.9	4.8	5.1	6.1	12.3
3	Mentor Graphics	4.0	2.7	4.6	67.1	11.1
4	Zycad	1.4	1.6	3.7	125.2	9.0
5	COMPASS Design Automation	2.2	3.7	3.1	-16.2	7.5
6	Synopsys	1.2	2.2	2.4	7.5	5.8
7	ALS Design	1.3	1.4	1.6	12.7	3.8
8	Autodesk	1.1	1.2	1.2	-1.2	2.8
9	Hewlett-Packard	1.0	1.1	1.2	7.9	2.8
10	Serbi	1.0	0.8	0.8	-	1.9
11	Norlinvest Ltd.	0.4	0.5	0.5	-	1.3
12	Intergraph	0.7	0.5	0.5	-8.8	1.2
13	Harris EDA	0.3	0.3	0.4	27.6	0.9
14	3Soft	-	-	0.3	NA	0.7
15	MacNeal-Schwendler	0.1	0.1	0.3	203.3	0.6
16	Wiechers Datentechnik	-	0.1	0.2	120.6	0.6
17	Zuken-Redac	1.0	0.4	0.2	-50.4	0.5
18	Star Informatic	-	0.2	0.2	-4.8	0.5
19	VLSI Libraries	-	-	0.2	NA	0.4
20	i-Logix	-	0.1	0.1	3.7	0.3
21	Sagantec	-	-	0.1	NA	0.2
22	ISDATA	0.1	0.1	0	-5.2	0.1
23	Design Acceleration	-	-	0	NA	0.1
24	Contec Microelectronics	-	0	0	10.0	0.1
25	Intusoft	-	-	0	NA	0.1
26	Kloeckner-Moeller	0	0	0	-	0
27	Siemens Nixdorf Info systeme	0	0	0	-22.6	0
28	PADS Software	-	0	0	-47.0	0
29	Ziegler Informatics	0.1	0.1	0	-90.1	0
	Other Companies	6.2	7.0	9.0	29.5	21.9
	All N.A. Companies	22.3	22.1	28.5	28.7	69.1
	All European Companies	2.8	3.2	3.5	10.6	8.5
	All Asian Companies	1.0	0.4	0.2	-50.4	0.5
	All Companies	32.3	32.7	41.2	26.1	100.0

NA = Not applicable
*Company statistics contain VAR/distributor revenue not counted in total
Source: Dataquest (August 1995)

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Table A-7
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 France Software Companies, IC Layout, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Cadence	4.7	3.2	3.5	10.7	42.2
2	COMPASS Design Automation	1.5	2.1	2.6	19.8	30.9
3	Mentor Graphics	0.5	0.4	1.1	162.6	13.4
4	Sagantec	0.3	0.4	0.4	3.9	4.7
5	Intergraph	0.1	0.1	0.1	-19.3	0.7
6	Silicon Valley Research	0.4	0.1	0	-77.9	0.3
7	Summitt Design	0	0	0	3.6	0.3
	Other Companies	0.2	0.4	0.6	77.1	7.5
	All N.A. Companies	7.1	5.9	7.3	22.6	87.9
	All European Companies	0.3	0.4	0.4	3.9	4.7
	All Asian Companies	-	-	-	NA	-
	All Companies	7.7	6.6	8.3	24.5	100.0

NA = Not applicable
*Company statistics contain VAR/distributor revenue not counted in total
Source: Dataquest (August 1995)

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Table A-8
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 France Software Companies, PCB/MCM/Hybrid, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Mentor Graphics	1.8	1.1	1.9	70.2	23.5
2	Norlinvest Ltd.	1.2	1.6	1.7	6.9	20.9
3	Zuken-Redac	2.1	1.3	1.2	-10.9	14.3
4	Harris EDA	1.1	1.0	0.9	-7.2	11.1
5	Cadence	0.8	0.7	0.7	-4.0	8.5
6	ALS Design	0.5	0.5	0.5	14.7	6.3
7	IBM	0.4	0.3	0.3	-1.7	3.7
8	Altium*	0.4	0.3	0.3	-1.7	3.7
9	Intergraph	0.8	0.4	0.3	-30.0	3.2
10	PADS Software	-	0.1	0.1	-15.6	1.1
11	ULTImate Technology	0	0	0	86.8	0.5
12	Ziegler Informatics	0	0.1	0	-94.7	0
13	EME	0.9	0.4	-	-100.0	-
	Other Companies	0.4	0.3	0.6	74.7	6.9
	All N.A. Companies	5.4	3.6	4.2	15.5	51.1
	All European Companies	2.6	2.5	2.3	-9.0	27.7
	All Asian Companies	2.1	1.3	1.2	-10.9	14.3
	All Companies	10.5	7.7	8.1	5.6	100.0

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-9
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 France Software Companies, All Applications, UNIX

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Matra Datavision	28.4	29.4	34.0	15.7	16.6
2	IBM	12.9	18.5	27.5	48.9	13.5
3	Dassault*	26.3	23.5	23.3	-0.9	11.4
4	Computervision	29.1	20.9	22.1	6.1	10.8
5	Parametric Technology	4.5	8.8	14.3	62.5	7.0
6	Cadence	13.2	8.7	9.3	6.9	4.5
7	Intergraph	11.7	11.9	8.4	-29.5	4.1
8	Mentor Graphics	6.2	4.2	7.5	76.6	3.7
9	COMPASS Design Automation	3.7	5.8	5.6	-3.0	2.8
10	SDRC	4.5	4.4	5.3	18.7	2.6
11	Hewlett-Packard	6.0	5.2	4.9	-6.6	2.4
12	EDS Unigraphics	4.0	3.7	4.8	26.8	2.3
13	Zycad	1.4	1.6	3.7	125.2	1.8
14	Framasoft	2.9	3.1	3.5	10.2	1.7
15	ESRI	2.6	3.3	3.4	3.1	1.6
16	MacNeal-Schwendler	1.1	3.8	3.0	-19.8	1.5
17	APIC Systemes	1.6	2.0	2.5	24.9	1.2
18	Synopsys	1.2	2.2	2.4	7.5	1.2
19	Viewlogic Systems	1.4	2.2	2.4	5.2	1.2
20	Assigraph	1.1	2.1	2.2	4.3	1.1
21	Star Informatic	3.3	1.8	2.0	11.7	1.0
22	Applicon	3.0	1.9	1.6	-15.0	0.8
23	ICL	1.4	1.4	1.6	10.4	0.8
24	Autodesk	1.1	1.2	1.3	14.0	0.7
25	Zuken-Redac	2.7	1.4	1.3	-4.7	0.7
26	Ansys	1.0	0.9	1.1	21.6	0.5
27	Harris EDA	1.2	1.1	1.1	-5.3	0.5
28	CAD Centre	0.8	0.7	0.9	37.3	0.5
29	ADRA Systems	-	0.7	0.8	11.5	0.4
30	Clemessy Geocity	0.7	0.7	0.8	9.5	0.4
	Other Companies	11.4	14.5	17.7	21.7	8.7
	All N.A. Companies	111.1	113.3	133.2	17.5	65.2
	All European Companies	46.9	45.8	52.1	13.8	25.5
	All Asian Companies	2.7	1.4	1.3	-4.7	0.7
	All Companies	172.0	175.0	204.3	16.7	100.0

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-10
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 France Software Companies, All Applications, NT/Hybrid

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Intergraph	-	0.3	3.4	926.0	63.4
2	Parametric Technology	-	-	1.6	NA	29.3
3	ESRI	-	-	0.2	NA	4.0
4	Mentor Graphics	-	-	0.1	NA	1.1
5	IEZ	-	-	0	NA	0.4
6	Intusoft	-	-	0	NA	0.3
7	PCI Remote Sensing Corp	-	-	0	NA	0.3
8	EA Systems	-	-	0	NA	0.2
	Other Companies	-	0.1	0	-14.8	0.9
	All N.A. Companies	-	0.3	5.4	1,498.4	98.7
	All European Companies	-	-	0	NA	0.4
	All Asian Companies	-	-	-	NA	-
	All Companies	-	0.4	5.4	1,283.1	100.0

NA = Not applicable
*Company statistics contain VAR/distributor revenue not counted in total
Source: Dataquest (August 1995)

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Table A-11
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 France Software Companies, All Applications, Personal Computer

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Autodesk	17.5	18.5	21.1	14.0	37.2
2	Serbi	6.3	6.1	6.8	10.7	12.0
3	Intergraph	2.0	3.1	4.5	44.7	7.9
4	Viewlogic Systems	0.6	1.5	3.1	114.2	5.5
5	Norlinvest Ltd.	1.6	2.1	2.2	5.2	3.9
6	ALS Design	1.7	1.8	2.1	13.4	3.6
7	ACA Ltd.	1.5	1.6	1.8	9.3	3.2
8	IBM	2.4	1.6	1.3	-24.1	2.2
9	Altium*	2.4	1.6	1.3	-24.1	2.2
10	Computervision	1.1	1.0	1.2	20.6	2.1
11	ESRI	0.6	1.1	1.0	-3.3	1.8
12	Graphisoft Group	0.6	0.6	0.9	40.8	1.6
13	Investronica SA	0.3	0.3	0.8	133.3	1.4
14	Matra Datavision	-	0.5	0.7	62.1	1.3
15	Nemetschek	-	0.4	0.6	82.7	1.1
16	CATALPA groupe Missler	0.1	0.4	0.5	15.8	0.8
17	Hewlett-Packard	0.1	0.1	0.4	463.0	0.7
18	RoboCAD Solutions	0.4	0.3	0.4	13.1	0.7
19	Ansys	0.4	0.3	0.4	9.1	0.6
20	ADRA Systems	-	0.3	0.3	11.5	0.6
21	Ziegler Informatics	0.3	0.3	0.3	-16.9	0.5
22	ASHLAR	0	0.1	0.3	190.3	0.5
23	CAD Lab	0.1	0.1	0.2	99.3	0.4
24	Superdraft	0.1	0.1	0.2	46.9	0.3
25	Harris EDA	0.1	0.1	0.2	100.0	0.3
26	Rebis	-	-	0.2	NA	0.3
27	PCI Remote Sensing Corp	-	0.1	0.2	74.6	0.3
28	Wiechers Datentechnik	-	0.1	0.1	107.0	0.2
29	Siemens Nixdorf Info systeme	-	0.1	0.1	38.6	0.2
30	B.A.Intelligence Networks	0	0.1	0.1	56.7	0.2
	Other Companies	3.1	3.1	4.0	28.4	7.1
	All N.A. Companies	25.1	28.6	34.8	21.5	61.1
	All European Companies	18.6	18.6	18.0	-3.2	31.7
	All Asian Companies	0.5	0.3	0	-91.2	0
	All Companies	47.4	50.7	56.9	12.2	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-12
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 France Software Companies, All Applications, Host/Proprietary

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	IBM	11.6	6.9	8.7	26.2	77.5
2	Dassault*	15.4	10.1	8.1	-20.0	72.1
3	MacNeal-Schwendler	1.6	1.9	1.1	-40.5	10.1
4	GDS	0.5	0.5	0.4	-24.2	3.4
5	Framasoft	0.3	0.4	0.4	-10.1	3.1
6	ESRI	0	0.2	0.2	-0.6	1.9
7	Ansys	0.3	0.3	0.2	-35.8	1.5
8	Mechanical Dynamics	-	0.1	0.1	18.0	0.6
9	Siemens Nixdorf Info systeme	0.1	0.1	0.1	-57.3	0.5
10	PCI Remote Sensing Corp	-	0	0	16.4	0.2
11	EA Systems	-	0	0	-43.8	0.1
12	Assigraph	1.1	0.2	0	-93.3	0.1
13	Harris EDA	0.1	0	0	-66.7	0.1
14	GRAFTEK	0	0	0	-11.1	0.1
15	EDS Unigraphics	-	0.8	-	-100.0	-
16	ACA Ltd.	0.3	0.2	-	-100.0	-
17	Intergraph	-	0.1	-	-100.0	-
18	Macao Systems	0.2	0.1	-	-100.0	-
19	SDRC	0.2	0	-	-100.0	-
20	ICEM Technologies	0.3	0	-	-100.0	-
21	Han Dataport	0	0	-	-100.0	-
	Other Companies	0.8	0.3	0.1	-63.4	1.0
	All N.A. Companies	14.9	10.8	10.7	-0.9	95.3
	All European Companies	3.3	0.9	0.4	-55.3	3.7
	All Asian Companies	-	-	-	NA	-
	All Companies	19.0	12.1	11.3	-6.7	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table B-1
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All France Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	3Soft	-	-	0.3	NA	0.1
2	ACA Ltd.	1.8	1.8	1.8	0.5	0.7
3	ADRA Systems	-	1.0	1.1	11.5	0.4
4	ALS Design	1.8	1.8	2.1	13.2	0.8
5	Altium*	2.4	1.6	1.3	-24.1	0.5
6	Anilam Electronics	0	0	0	-	0
7	Ansys	1.7	1.5	1.6	9.1	0.6
8	APIC Systemes	1.6	2.0	2.5	24.9	0.9
9	Applicon	3.0	1.9	1.7	-12.2	0.6
10	ASHLAR	0	0.1	0.3	190.3	0.1
11	Assigraph	2.3	2.3	2.2	-2.2	0.8
12	Autodesk	18.6	19.7	22.5	14.0	8.1
13	B.A.Intelligence Networks	0.1	0.2	0.2	56.7	0.1
14	BATISOFT	2.3	1.0	-	-100.0	-
15	CAD Centre	0.8	0.7	0.9	37.3	0.3
16	CAD Lab	0.5	0.5	0.6	34.9	0.2
17	Cadence	13.4	8.7	9.3	6.9	3.3
18	CAMAX Manufacturing	-	0.1	0.2	190.6	0.1
19	Caroline Informatique	1.1	1.3	-	-100.0	-
20	CATALPA groupe Missler	1.2	1.1	1.0	-4.9	0.4
21	CIMLINC	0.1	0.1	0.1	17.3	0.1
22	Clemessy Geocity	0.8	0.7	0.8	9.5	0.3
23	COMPASS Design Automation	3.7	5.8	5.6	-3.0	2.0
24	Computervision	30.6	21.8	23.3	6.7	8.4
25	Contec Microelectronics	-	0	0	10.0	0
26	Dassault*	41.7	33.7	31.4	-6.7	11.3
27	Datagraphic	1.3	1.3	-	-100.0	-
28	Delcam International	0.6	0.1	0.1	55.0	0
29	Design Acceleration	-	-	0	NA	0
30	DP Technology	0	0	0.1	13.5	0
31	EA Systems	-	0	0	-10.0	0
32	EDS Unigraphics	4.0	4.5	4.8	5.1	1.7
33	EME	1.5	0.9	-	-100.0	-
34	ESRI	3.2	4.6	4.8	6.2	1.7
35	FEGS	0	0	-	-100.0	-
36	Framasoft	3.2	3.5	3.8	8.0	1.4
37	GDS	0.6	0.7	0.7	5.1	0.3

(Continued)

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All France Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
38	Gerber Systems	0.1	0.3	0.1	-68.1	0
39	GRAFTEK	0	0.1	0.1	7.1	0
40	Graphisoft Group	0.6	0.6	0.9	40.8	0.3
41	Han Dataport	0.1	0.1	0.1	27.4	0.1
42	Harris EDA	1.4	1.3	1.3	0.8	0.5
43	Hewlett-Packard	6.1	5.3	5.3	-0.5	1.9
44	i-Logix	-	0.1	0.1	3.7	0
45	IBM	26.9	27.1	37.5	38.6	13.5
46	ICEM Technologies	0.5	0.1	0.7	939.7	0.2
47	ICL	1.4	1.4	1.6	10.4	0.6
48	IEZ	-	-	0.4	NA	0.1
49	Intergraph	13.7	15.4	16.3	5.8	5.9
50	Intusoft	-	-	0	NA	0
51	Investronica SA	0.3	0.3	0.8	133.3	0.3
52	ISD Software	0.1	0.1	0.1	8.9	0
53	ISDATA	0.1	0.1	0	-5.2	0
54	Kloeckner-Moeller	0	0	0	-	0
55	Kockums Computer Systems	0.2	0.1	0.1	-	0
56	Kreon	0.1	0.2	-	-100.0	-
57	Laser-Scan	0	-	0.1	NA	0
58	Livermore Software Tech.	0	0.1	0.1	48.6	0
59	Macao Systems	0.5	0.4	-	-100.0	-
60	MacNeal-Schwendler	2.7	5.7	4.2	-27.2	1.5
61	Matra Datavision	29.1	29.8	34.7	16.4	12.5
62	MCS	0.1	0.1	0.1	3.0	0
63	Mechanical Dynamics	-	0.4	0.4	20.0	0.2
64	Mentor Graphics	6.3	4.3	7.6	77.3	2.7
65	MOSS Systems Group	-	0.1	0.1	18.1	0
66	Nemetschek	-	0.4	1.2	164.3	0.4
67	Norlinvest Ltd.	1.6	2.1	2.2	5.2	0.8
68	PADS Software	-	0.1	0.1	-19.2	0
69	PAFEC	0.5	0.4	0.4	5.0	0.2
70	Parametric Technology	4.5	9.2	15.9	72.4	5.7
71	Pathtrace Engineering Systems	0.1	0	0.1	75.0	0
72	PCI Remote Sensing Corp	-	0.3	0.3	16.4	0.1
73	Radan Computational	0.1	0.1	0.1	-12.5	0
74	Rebis	-	-	0.2	NA	0.1

(Continued)

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All France Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
75	RoboCAD Solutions	0.4	0.3	0.4	13.1	0.1
76	Sagantec	0.3	0.4	0.5	29.9	0.2
77	SDRC	4.7	4.5	5.3	17.5	1.9
78	Serbi	6.3	6.1	6.8	10.7	2.4
79	Siemens Nixdorf Info systeme	0.6	0.6	0.6	2.6	0.2
80	Silicon Valley Research	0.4	0.1	0	-77.9	0
81	Star Informatic	3.3	1.9	2.1	11.3	0.7
82	Straessle Informationssysteme	0.6	0.1	-	-100.0	-
83	Summitt Design	0	0	0	3.6	0
84	Superdraft	0.1	0.1	0.2	46.9	0.1
85	Synopsys	1.2	2.2	2.4	7.5	0.9
86	Sysdeco Innovation	0	0	0	-	0
87	ULTImate Technology	0	0	0	86.8	0
88	UNISYS	0.3	0.4	0.6	53.7	0.2
89	Variation Systems Analysis	-	0	0	100.0	0
90	Viewlogic Systems	2.0	3.7	5.5	48.4	2.0
91	VLSI Libraries	-	-	0.2	NA	0.1
92	Wiechers Datentechnik	-	0.1	0.2	120.6	0.1
93	Ziegler Informatics	0.3	0.3	0.3	-16.9	0.1
94	Zuken-Redac	3.2	1.7	1.4	-20.3	0.5
95	Zycad	1.4	1.6	3.7	125.2	1.3
	Other Companies	15.5	17.8	21.7	21.6	7.8
	All N.A. Companies	151.1	153.1	184.0	20.2	66.3
	All European Companies	68.7	65.4	70.6	8.0	25.4
	All Asian Companies	3.2	1.7	1.4	-20.3	0.5
	All Companies	238.5	238.0	277.6	16.7	100.0

NA = Not applicable
*Company statistics contain VAR/distributor revenue not counted in total
Source: Dataquest (August 1995)

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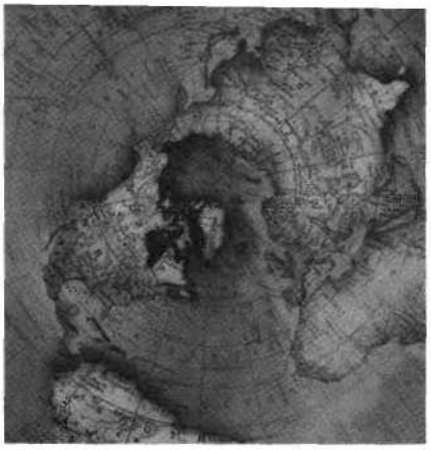
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1994 CAD/CAM/CAE/GIS United Kingdom Market Share Update

Market Statistics

Program: CAD/CAM/CAE/GIS Europe
Product Code: CCAM-EU-MS-9504
Publication Date: September 25, 1995
Filing: Market Analysis

1994 CAD/CAM/CAE/GIS United Kingdom Market Share Update



Market Statistics

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Note: All tables show estimated data.

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1994 CAD/CAM/CAE/GIS United Kingdom Market Share Update

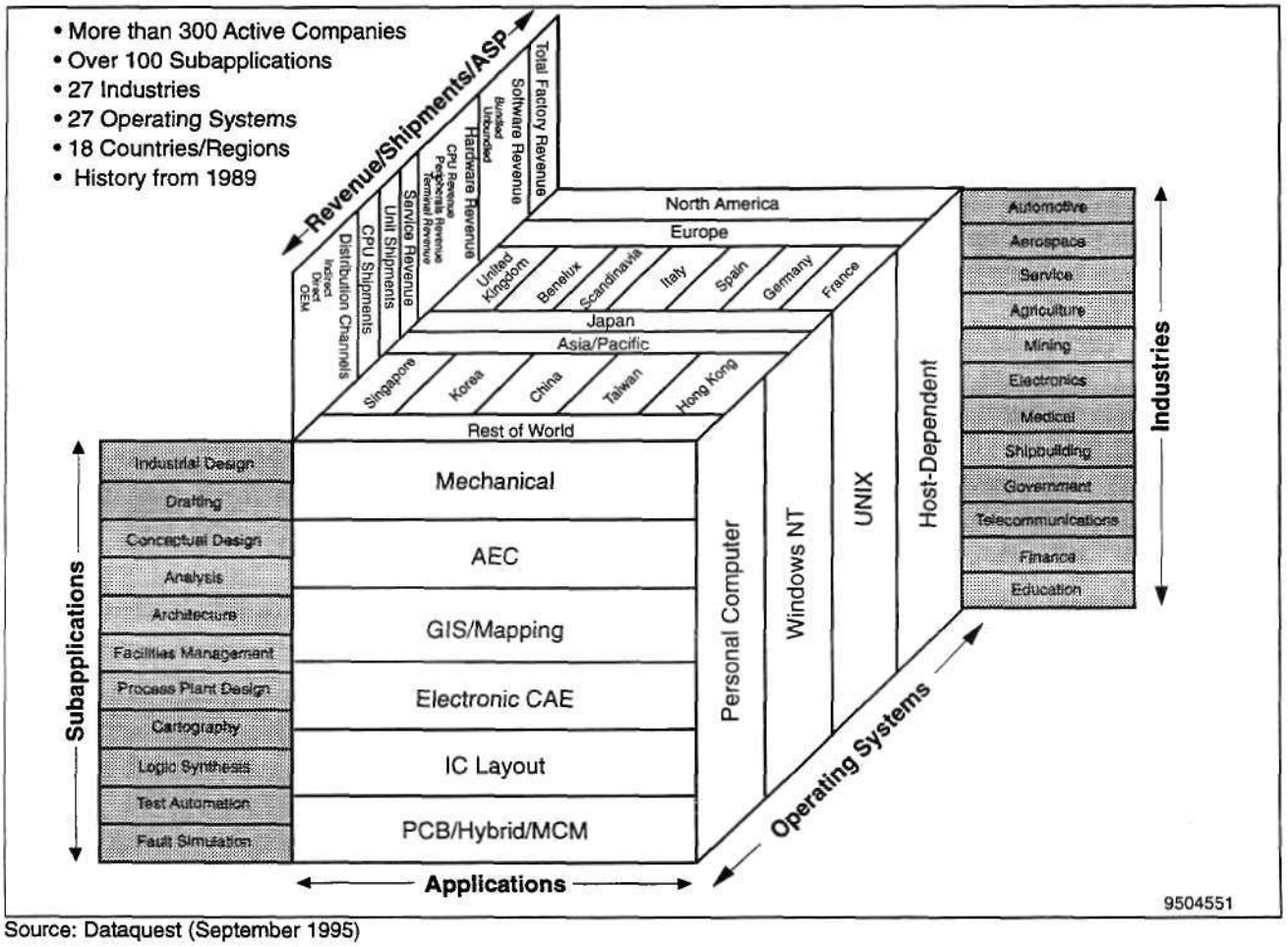
Introduction

CAD/CAM/CAE/GIS systems have dramatically changed the methods by which designers and production managers originate and implement products. CAD and CAE systems allow designers to create, draft, analyze, test, and manipulate products on a screen in two and three dimensions. As CAD/CAM/CAE/GIS systems continue to decrease in cost, they become more available and cost-justifiable to new users.

In order to provide a comprehensive view of the CAD/CAM/CAE/GIS industry, Dataquest's CAD/CAM/CAE/GIS group maintains a large database of industry information. The type of information contained in the database is depicted in Figure 1.

Table 1 summarizes the performance in various segments of the CAD/CAM/CAE/GIS markets in 1994 versus 1993.

Figure 1
CAD/CAM/CAE/GIS Market Database



Source: Dataquest (September 1995)

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Table 1
CAD/CAM/CAE/GIS Market Summary, 1993 to 1994

	Software Revenue		1993-1994	Total Factory Revenue		1993-1994	Seat Shipments		1993-1994
	1993	1994	Growth (%)	1993	1994	Growth (%)	1993	1994	Growth (%)
Applications									
Mechanical	2,248.9	2,455.5	9.2	7,374.9	7,968.8	8.1	279,480	298,442	6.8
AEC	752.3	849.0	12.9	2,204.7	2,401.1	8.9	198,114	211,550	6.8
GIS/Mapping	793.1	917.2	15.7	2,129.2	2,420.9	13.7	88,672	108,107	21.9
Electronic CAE	803.3	886.3	10.3	2,297.0	2,482.2	8.1	94,651	108,019	14.1
IC Layout	180.8	216.9	20.0	601.0	721.7	20.1	10,911	12,740	16.8
PCB/MCM/Hybrid	244.0	252.1	3.3	789.8	788.3	-0.2	29,042	27,766	-4.4
Electronic Design Automation	1,228.0	1,355.2	10.4	3,687.8	3,992.2	8.3	134,604	148,525	10.3
All Applications	5,022.3	5,577.0	11.0	15,396.6	16,782.9	9.0	700,869	766,623	9.4
Region									
North America	1,856.7	2,045.6	10.2	5,614.9	6,189.1	10.2	312,240	343,290	9.9
Europe	1,660.3	1,864.4	12.3	5,272.8	5,750.2	9.1	237,945	258,480	8.6
Japan	1,203.4	1,315.8	9.3	3,728.1	3,909.9	4.9	99,963	102,239	2.3
Asia/Pacific	208.0	255.4	22.8	538.2	676.9	25.8	33,753	44,643	32.3
Rest of World	93.9	95.8	2.0	242.6	256.9	5.9	16,968	17,971	5.9
Worldwide	5,022.3	5,577.0	11.0	15,396.6	16,782.9	9.0	700,869	766,623	9.4
Operating System									
UNIX	3,466.6	3,874.3	11.8	10,861.7	11,946.9	10.0	192,244	221,152	15.0
Host	301.4	197.9	-34.3	1,616.0	1,269.4	-21.5	27,091	21,566	-20.4
Windows NT	5.5	106.4	1,845.3	10.3	282.7	2,644.1	226	6,764	2,892.9
PC	1,248.9	1,398.3	12.0	2,908.5	3,283.9	12.9	481,308	517,141	7.4
All Operating Systems	5,022.3	5,577.0	11.0	15,396.6	16,782.9	9.0	700,869	766,623	9.4

Note: This table includes software content (data) companies for GIS/mapping. However, the AEC and GIS market share book (*1994 CAD/CAM/CAE/GIS AEC and GIS Market Share*, CAEC-WW-MS-9501) does not.
Source: Dataquest (September 1995)

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About This Document

This document contains Dataquest's detailed market share information on the CAD/CAM/CAE/GIS industry. The following list contains descriptions of the companies included in the Market Share books. See Tables 2, 3, 4, and 5 for changes from our 1993 report.

- Mechanical applications—All companies in database with mechanical revenue
- GIS and AEC applications—All companies in database with GIS revenue and all companies in database with AEC revenue. We also have added GIS data companies.
- Electronic design automation applications—All companies in database with EDA (electronic CAE, IC layout, PCB/hybrid/MCM) revenue
- Europe overview—All companies with European revenue
- Asia—All companies with Asian revenue

We no longer publish top-level market statistics for the entire CAD/CAM/CAE/GIS industry. This data is available by calling Suzanne Snygg at (408) 468-8124. More detailed data on these markets may be requested through our client inquiry service.

We no longer publish data by hardware platform; instead we report by four major operating systems: UNIX, host, Windows NT, and PC.

This document represents our final estimates of 1994 shipments and revenue.

Dataquest's policy is to continually update its market information, for current and past years, with any new data received in order to arrive at the most accurate market representation possible.

Table 2
Companies Renamed Since 1993

Original Company Name	New Company Name
ACDS Graphic System	Geomax International
Genrad	VEDA
GeoVision	SHL Systemhouse
Graphisoft Software Dev	Graphisoft Group
ICAD	Concentra
Kohns & Poppenhaeger	Poppenhaeger Grips GmbH
Microway	M.O.C.
Scientific & Engineering Software	SES Inc.
Silvar-Lisco	SVRI (Silicon Valley Research Inc.)
Smallworld Systems	SmallworldWide
Swanson Analysis	Ansys
Tactics International	Tactician Corporation

Source: Dataquest (September 1995)

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Table 3
Companies (or CAD Portions of Companies) Sold/Merged in 1994

Company Name	Acquired by/Merged with
Aries Technology	MacNeal-Schwendler
ANACAD-EES	Mentor Graphics
Betronex & Visionics	Norlinvest Ltd.
Cisigraph	Matra
Digital—Mechanical Software	PROCAD GmbH
Chronological Simulation	Viewlogic
Computervision—GIS	Unisys
Control Data—Mechanical Software	ICEM Technologies
Foresight Resources	Softdesk
Generation 5 Technology	Geo/SQL Corporation
Gerber Systems (CAD portion)	Matra
Kork Systems	Autometric
LandCadd	Eagle Point
Logic Modeling Corp.	Synopsys
Massteck	OrCAD
Model Technology	Mentor Graphics
NeoCAD	Xilinx
PDA Engineering	MacNeal-Schwendler
Point Control	CAMAX Manufacturing
Racal-Redac	Zuken-Redac
Sunrise	Viewlogic
Syscan	Sysdeco Innovation

Source: Dataquest (September 1995)

Table 4
Companies Deleted from Database Since 1993

Region/Company	
North American	European
A.I. Systems	Aplein*
Apple Computer	Aucos elektronische
Aura CAD/CAM Systems	BATISOFT
CAE-link	CAD-Capture
Claris	CAD TECH Iberica*
Compact Software	CAMTEK
Control Data—Hardware	Caroline Informatique
Data General	Contract Data Research
ECOM Associates	Data Technology/DATECH*
Georgia Tech Research	Datagraphic
GEOVISION Inc.	DELTA CAD*
Infinite Graphics	EME

(Continued)

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Table 4
Companies Deleted from Database Since 1993 (Continued)

Region/Company	
North American (Continued)	European (Continued)
Innovative Data Design	FEA
Intrinsix	FEGS
Land Innovation	ItalCad
Maptech	Kreon
MC2 Engineering Software	Lamp Software
Moda CAD	Logic Systems Designers*
Phase Three Logic	Macao Systems
Synercom	MEDESIGN
Teradyne	Mucke Software
Understanding Systems	S.T.L.D.s.r.l.
Asian	Soft*
Kanematsu Semiconductor*	

*Distributors
Source: Dataquest (September 1995)

Table 5
Companies Added to Database Since 1993

Region/Company	
North American	European
3Soft	Abstract Hardware
Access Corp.	ACA Ltd.
ArcSys	Cimtel Ltd.
B.A. Intelligence Networks	Eigner + Partner GmbH
Boothroyd Dewhurst	HoSoft CAD
Cadis Software	Speed
CGTech	Spot Image Corp.
Chronology	ULTimate Technology
Cimplex	WiN Technology
Claritas/NPDC	
CMstat	
CSAR Corp.	
Database Applications Inc.	
Deneb Robotics	
DB Technology	
Design Acceleration	
Eagle Point	
EOSAT	
Equifax/NDS	
Fintronic	
Formtek	
Geographic Data Technology	
Gibbs and Assoc.	

(Continued)

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Table 5
Companies Added to Database Since 1993 (Continued)

Region/Company
North American (Continued)
Integrity Engineering
InterHDL
Intusoft
Livermore Software Tech. Corp.
Nextwave DA
NOVASOFT Systems
OEA International
Optem Engineering
Rebis (merger of EDA and ADev)
Sherpa Corp.
Simulation Technology
SRAC
Surfware
T D Technology
Tecnomatics Tech.
UniCAD
Variation Systems Analysis
Veritools
VISTA Environmental Inf.
Workgroup Tech

*Distributors
Source: Dataquest (September 1995)

Segmentation Definitions

This section lists the definitions specific to this document. The following paragraphs define the segments.

Applications

Mechanical

The mechanical segment refers to computer-aided tools used by engineers, designers, analysts, technicians, and draftspeople working predominantly in the discrete manufacturing industries, but includes government and education. Users of mechanical CAD/CAM/CAE tools work in all departments across the typical organization, with a majority found in product design, advanced engineering, and manufacturing engineering. Common design applications include conceptual design, industrial design, structural or thermal analysis, detail design, and electromechanical design (the mechanical part of design with electrical or electronic components and mechanisms). Common manufacturing applications include tool and fixture design, numerical control part programming, offline robotics programming, and interface to quality control systems. Management tools for database control and distribution are included in this segment, as well as user-defined application programming.

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Architecture, Engineering, and Construction (AEC)

The AEC segment covers the use of computer-aided tools by architects, contractors, plant engineers, civil engineers, and other people associated with these disciplines to aid in designing and managing buildings, industrial plants, ships, and other types of nondiscrete entities.

Geographic Information Systems (GIS)/Mapping

GIS is computer-based technology, and the segment comprises hardware, software, and data used to capture, edit, display, and analyze spatial (tagged by location) information.

Electronic Design Automation (EDA)

The EDA segment covers computer-based tools used to automate the design of an electronic product, including printed circuit boards, ICs, and systems. EDA includes ECAE, IC layout, and PCB/hybrid/MCM, as follows:

- Electronic computer-aided engineering (ECAE)—These are computer-aided tools used in the engineering or design phase of electronic products (as opposed to the physical layout phase of the product). Examples of electronic CAE applications are schematic capture and simulation.
- IC layout—This is a software application tool used to create and validate the physical implementation of an IC. The IC layout category comprises polygon editors, symbolic editors, placement and routing (gate array, cell, and block), and design verification tools (DRC/ERC/logic-to-layout).
- PCB/hybrid/MCM—This segment covers products used to create the placement and routing of the traces and components laid out on a printed circuit board. Also included in this category are thermal analysis tools.

Regions

The following paragraphs define the regions.

North America

North America includes the United States, Mexico, and Canada.

Europe

Europe includes the United Kingdom, Scandinavia, Benelux, France, Germany, Italy, Spain, and Rest of Europe.

Japan

Asia/Pacific

Asia includes Singapore, Taiwan, Korea, China, and Hong Kong.

Rest of World

Rest of World includes all other countries including Australia, New Zealand, India, Africa, Central America, South America, and the Middle East.

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Operating Systems

Dataquest defines the operating systems as follows:

- UNIX: UNIX includes all UNIX variants and older workstation operating systems.
- Host: Host includes minicomputer and mainframe operating systems in which the functions of external workstations are dependent on a host computer.
- Windows NT: Windows NT is the Microsoft operating system. We understand that code for Windows NT and Windows will be merged within the next three years. The probability is high that Microsoft will develop a client environment and a server environment. In our forecast, the future client environment is included in PC operating systems, and the future server environment is referenced as NT. Also included in NT is potential for an additional, new, high-end operating environment that could be developed by any vendor.
- PC: PC includes DOS, Windows, Windows 95, and Apple operating systems.

Metrics

The following paragraphs define measurements:

- Total factory revenue is defined as the amount of money received by a manufacturer for its goods and services measured in U.S. dollars. Total factory revenue does not include revenue that a company may receive from products that are sold to another company for resale (OEM revenue). Total factory revenue is the sum of software revenue, hardware revenue, and service revenue.
- Unit shipment is defined as the number of seats delivered (number of possible simultaneous users of product delivered) excluding OEM shipments.
- Hardware revenue is revenue derived from sales of CPUs (including operating systems), terminals (for host-dependent systems), and peripherals.
- Software revenue is revenue derived from the sale of application software that exists on a company's standard price list.
- Service revenue is defined as all revenue derived from the service and support of CAD/CAM/CAE/GIS systems. Service revenue can be calculated in the tables by subtracting hardware and software revenue from total revenue. A split by hardware service and software service is available through inquiry.
  - Maintenance fees for hardware and software
  - Management and operations services—help desk, education and training, disaster recovery, vaulting, and configuration management

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- Service bureau—project work, including construction of database, data conversion, product design, analysis, or manufacturing
- Application development—design and development of customized software applications or the modification, enhancement of customization of existing software applications, adding new functionality
- Consulting revenue—assessment of CAD/CAM/CAE/GIS business and information technology needs and the formulation of a plan based on needs identification
- Implementation and integration services—planning, implementation, migration, and integration of software products (software network support and integration, account integration management, data center design, and construction)

Market Share Methodology

Dataquest uses both primary and secondary sources to produce our market share data. In the fourth quarter of each year and second quarter of the subsequent year, we survey all participants in each industry. Each vendor is offered the opportunity to self-report the information required. Although there is a primary contact for each company, large companies are surveyed across product lines and across geographic regions. Thus there is a corresponding increase in the number of contacts at large companies. (Dataquest maintains a large contact database on all sources of information.) Examples of the job titles of people contacted for information are the following:

- President and CEO
- Vice president and general manager
- Vice president of marketing
- Vice president, strategic product planning
- Director of strategic planning
- Director of marketing
- Director of market development
- Manager, CAD/CAM/CAE/GIS marketing programs
- Market research analyst

The Audit Process

Data supplied by vendors is evaluated against information drawn from many sources, including the following:

- Revenue published by major industry participants
- Estimates made by knowledgeable and reliable industry spokespersons
- Government data or trade association data

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- Published product literature and price lists
- Interviews with knowledgeable manufacturers, distributors, and users
- Relevant economic data
- Information and data from online data banks
- Articles in both the general and trade press
- Annual reports, SEC documents, credit reports
- Company publications and press releases
- Reports from financial analysts
- User studies
- Reseller and supplier reports and reports from a vendor's competitors

Dataquest also sums vendor revenue across other industries covered by Dataquest to make sure that revenue is not credited twice, and checks with multiple sources at one company to cross-check data on that company.

Dataquest analysts have many years of experience in how to apply the tools described to get the most accurate information possible on a particular company (such as what to use when and what industry averages are). We believe that the estimates presented here are the most accurate and meaningful generally available today. It is the CAD/CAM/CAE/GIS group's policy to continually update our market information for any year, based on any new data received, in order to arrive at the most accurate market representation possible.

Dataquest's CAD/CAM/CAE/GIS market numbers are often higher than those reported by other sources. We survey worldwide, which involves more vendors, higher total market revenue, lower market share per vendor, and a more accurate market picture—which is particularly useful when comparing regions or applications.

Publishing Schedule

We publish market share and forecasting twice each year for each, allowing for both timely distribution of data and thorough analysis and forecasting. Our annual delivery schedule is as follows:

- Market share will be published and distributed to clients by March 31.
- Forecasting from the market share tables provides a five-year forecast period, available after April 30. The books will be shipped by May 31.
- Final updated market share tables, based on additional data collection and analysis, will be completed by June 30. At this point, the market share database is frozen and will not be changed until the end of the year. For the next six months, supplementary market data will be based on this final market data. Books will be shipped by July 31. (Unfortunately, because of our database changes, updated market share table delivery was delayed beyond this date.)

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- We provide complete final forecast tables by July 31. These tables take into consideration changes in the market share during the previous six months. Books will be shipped by September 31.

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Table A-1
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 UK Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Computervision	34.2	27.0	31.7	17.6	11.0
2	Autodesk	19.9	19.7	22.5	14.0	7.8
3	Intergraph	20.5	18.5	19.3	4.3	6.7
4	Parametric Technology	3.6	8.2	14.2	72.4	4.9
5	IBM	9.7	11.6	13.6	17.0	4.7
6	ICL	9.9	10.5	9.9	-6.0	3.4
7	EDS Unigraphics	6.6	7.3	9.3	27.1	3.2
8	Radan Computational	8.3	8.5	8.4	-1.2	2.9
9	ESRI	3.2	4.5	7.7	72.5	2.7
10	Smallworld Systems	2.6	5.5	7.3	32.3	2.5
11	Mentor Graphics	4.5	4.1	7.1	72.4	2.5
12	Cadence	10.2	6.6	7.0	6.9	2.5
13	MacNeal-Schwendler	6.1	7.3	7.0	-4.0	2.4
14	Engineering Computer Services*	4.9	5.5	6.9	25.5	2.4
15	Hewlett-Packard	5.1	6.5	6.6	1.7	2.3
16	Dassault*	2.6	2.2	6.3	180.0	2.2
17	Sysdeco Innovation	2.2	6.4	6.2	-2.5	2.2
18	SDRC	4.2	4.2	5.4	29.1	1.9
19	PAFEC	5.6	4.5	4.4	-2.7	1.5
20	Computer Services Consultants	4.0	4.0	4.2	4.5	1.5
21	Viewlogic Systems	1.9	2.4	4.2	72.7	1.4
22	Synopsys	1.8	3.2	3.4	7.5	1.2
23	CAD Centre	2.7	2.4	3.3	37.3	1.1
24	RoboCAD Solutions	2.8	2.9	3.2	8.4	1.1
25	Whessoe Computing Systems	2.9	2.9	3.2	10.5	1.1
26	Matra Datavision	1.9	2.2	3.0	37.8	1.0
27	Laser-Scan	3.0	3.3	2.9	-13.3	1.0
28	Siemens Nixdorf Info systeme	3.0	2.7	2.8	3.1	1.0
29	Zuken-Redac	4.1	2.9	2.7	-5.4	1.0
30	Formtek	0.9	1.5	2.6	81.4	0.9
	Other Companies	15.7	17.7	21.6	21.9	7.5
	All N.A. Companies	152.3	150.5	183.1	21.7	63.7
	All European Companies	76.2	78.4	80.1	2.2	27.9
	All Asian Companies	4.1	2.9	2.7	-5.4	1.0
	All Companies	248.2	249.6	287.6	15.2	100.0

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-2
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 UK Software Companies, Mechanical, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Computervision	28.8	24.9	30.2	21.1	21.3
2	Parametric Technology	3.6	8.2	14.2	72.4	10.0
3	IBM	8.1	10.1	11.9	17.3	8.4
4	EDS Unigraphics	6.6	7.3	9.3	27.1	6.6
5	Autodesk	8.0	7.9	9.0	14.3	6.4
6	Radan Computational	7.5	7.6	7.5	-0.4	5.3
7	Engineering Computer Services*	4.9	5.5	6.9	25.5	4.8
8	MacNeal-Schwendler	5.9	7.2	6.5	-9.6	4.6
9	Dassault*	2.4	2.2	6.2	180.2	4.3
10	Hewlett-Packard	4.2	5.5	5.6	0.7	3.9
11	SDRC	4.2	4.2	5.4	29.1	3.8
12	Intergraph	4.8	3.8	3.7	-0.9	2.6
13	PAFEC	4.3	3.4	3.4	-0.6	2.4
14	Whessoe Computing Systems	2.9	2.9	3.2	10.5	2.2
15	Matra Datavision	1.7	2.0	3.0	49.4	2.1
16	Formtek	0.9	1.4	2.5	80.3	1.8
17	ICL	2.8	2.6	2.5	-5.0	1.8
18	Delcam International	5.3	2.2	2.4	6.3	1.7
19	Applicon	2.7	2.1	1.8	-12.2	1.3
20	RoboCAD Solutions	1.5	1.5	1.6	8.4	1.1
21	CIMLINC	1.2	1.3	1.5	17.3	1.1
22	Anilam Electronics	1.1	1.2	1.4	18.0	1.0
23	Ansys	1.4	1.3	1.4	9.1	1.0
24	Pathtrace Engineering Systems	0.9	0.8	1.0	31.6	0.7
25	MCS	0.9	1.0	1.0	2.7	0.7
26	Cimtel	1.0	1.0	0.8	-15.4	0.6
27	Superdraft	0.9	0.7	0.7	4.1	0.5
28	Computational Mechanics	1.4	0.5	0.5	3.0	0.4
29	Vero International Software	0.4	0.3	0.5	45.3	0.3
30	Mechanical Dynamics	-	0.4	0.4	20.0	0.3
	Other Companies	4.0	4.1	5.3	28.4	3.7
	All N.A. Companies	82.0	87.7	106.2	21.0	74.8
	All European Companies	35.3	30.6	30.4	-0.6	21.4
	All Asian Companies	-	-	-	NA	-
	All Companies	121.3	122.5	141.9	15.9	100.0

NA = Not applicable
*Company statistics contain VAR/distributor revenue not counted in total
Source: Dataquest (August 1995)

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Table A-3
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 UK Software Companies, AEC, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Autodesk	8.6	8.5	9.8	15.6	23.9
2	Intergraph	7.9	7.0	7.5	6.6	18.2
3	Computer Services Consultants	4.0	4.0	4.2	4.5	10.3
4	CAD Centre	2.7	2.3	3.1	37.3	7.5
5	MOSS Systems Group	3.0	2.0	2.3	18.1	5.6
6	RoboCAD Solutions	1.3	1.5	1.6	8.4	3.9
7	Ground Modelling Systems	0.8	0.7	1.6	113.7	3.8
8	Computervision	4.2	1.3	1.4	7.0	3.4
9	IBM	1.2	1.1	1.2	8.2	3.0
10	Elstree Computing	1.2	1.1	1.2	4.5	2.8
11	Radan Computational	0.9	0.9	0.8	-7.8	2.0
12	GDS	0.9	1.3	0.7	-46.5	1.7
13	Rebis	-	-	0.5	NA	1.2
14	Isicad	1.6	1.0	0.4	-56.2	1.1
15	Gable CAD Systems	0.6	0.6	0.4	-36.1	1.0
16	IEZ	-	-	0.4	NA	1.0
17	Soft-Tech Software Technologies	0.3	0.3	0.4	22.6	0.9
18	Graphisoft Group	0.1	0.1	0.3	123.2	0.8
19	PAFEC	0.3	0.2	0.2	-20.8	0.5
20	Star Informatic	0.1	0.1	0.2	33.3	0.4
21	Formtek	-	-	0.1	NA	0.4
22	Dassault*	0.2	0	0.1	169.9	0.3
23	Technische Computer Systeme	0.1	0.1	0.1	57.1	0.3
24	Altium*	0.2	0.2	0.1	-50.6	0.2
25	Hochtief	0	0	0.1	65.5	0.2
26	EA Systems	-	0.1	0.1	-10.0	0.1
27	ASHLAR	-	0	0	451.7	0.1
28	Lamp Software	0.9	0.9	-	-100.0	-
29	Matra Datavision	0.2	0.2	-	-100.0	-
30	CAD-Capture	0.2	0.1	-	-100.0	-
	Other Companies	2.2	2.4	2.4	0.4	5.9
	All N.A. Companies	24.3	20.3	21.7	7.2	53.1
	All European Companies	16.7	15.1	16.8	11.1	41.0
	All Asian Companies	-	-	-	NA	-
	All Companies	43.2	37.8	41.0	8.3	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-4
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 UK Software Companies, GIS/Mapping, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	ESRI	3.2	4.5	7.7	72.5	13.2
2	Smallworld Systems	2.6	5.5	7.3	32.3	12.4
3	ICL	6.9	7.7	7.2	-6.0	12.3
4	Intergraph	5.6	6.4	7.0	9.4	11.9
5	Sysdeco Innovation	2.2	6.4	6.2	-2.5	10.6
6	Laser-Scan	3.0	3.3	2.9	-13.3	4.9
7	Siemens Nixdorf Info systeme	3.0	2.7	2.8	3.1	4.7
8	Autodesk	2.2	2.2	2.5	15.0	4.2
9	MapInfo	0.3	1.0	2.0	101.5	3.3
10	GDS	5.0	1.1	1.7	53.5	2.9
11	Genasys II	1.0	1.0	1.1	4.9	1.8
12	Ground Modelling Systems	1.2	0.8	1.0	29.1	1.7
13	UNISYS	0.6	0.7	1.0	40.0	1.6
14	PAFEC	1.0	0.8	0.8	-6.0	1.3
15	Star Informatic	-	0.5	0.6	7.8	0.9
16	APIC Systemes	0.3	0.4	0.5	19.7	0.8
17	PCI Remote Sensing Corp	-	0.3	0.3	16.4	0.6
18	Enghouse Systems Ltd.	0.3	0.3	0.3	1.1	0.5
19	IBM	0.2	0.2	0.2	-2.6	0.3
20	Strategic Mapping	-	0.1	0.1	18.8	0.2
21	Terr-Mar Resource Info Svs	-	0.1	0.1	-10.8	0.1
22	Computervision	0.4	0.4	-	-100.0	-
23	Contract Data Research	0.6	0.3	-	-100.0	-
24	Formtek	0	0.1	-	-100.0	-
25	CAD-Capture	0.2	0.1	-	-100.0	-
26	Lamp Software	0.1	0.1	-	-100.0	-
	Other Companies	4.5	4.7	5.7	22.1	9.7
	All N.A. Companies	18.7	18.2	23.9	31.0	40.6
	All European Companies	21.1	28.6	29.2	2.2	49.7
	All Asian Companies	-	-	-	NA	-
	All Companies	44.3	51.5	58.8	14.2	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-5
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 UK Software Companies, Electronic Design Automation, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Mentor Graphics	4.5	4.1	7.1	72.4	15.5
2	Cadence	10.2	6.6	7.0	6.9	15.4
3	Viewlogic Systems	1.9	2.4	4.2	72.7	9.1
4	Synopsys	1.8	3.2	3.4	7.5	7.4
5	Zuken-Redac	4.1	2.9	2.7	-5.4	6.0
6	Harris EDA	1.5	1.5	1.6	2.6	3.4
7	Norlinvest Ltd.	0.7	0.9	1.4	52.1	3.1
8	Autodesk	1.2	1.2	1.2	-1.2	2.6
9	Intergraph	2.2	1.3	1.1	-17.5	2.4
10	Hewlett-Packard	0.9	0.9	1.0	7.9	2.2
11	i-Logix	-	0.8	1.0	29.6	2.1
12	Zycad	0.3	0.7	1.0	46.3	2.1
13	Sagantec	0.7	0.8	0.8	2.6	1.7
14	VLSI Libraries	-	-	0.8	NA	1.7
15	MacNeal-Schwendler	0.2	0.1	0.5	315.2	1.1
16	COMPASS Design Automation	0.9	0.5	0.5	-3.0	1.1
17	IBM	0.3	0.2	0.3	65.5	0.7
18	Altium*	0.3	0.2	0.3	65.5	0.7
19	Abstract Hardware	1.0	1.5	0.3	-81.6	0.6
20	Aucotec	0	0.1	0.3	212.5	0.5
21	Wiechers Datentechnik	-	0.1	0.2	120.6	0.5
22	CAD-UL	0.2	0.2	0.2	21.1	0.5
23	Summitt Design	0.3	0.2	0.2	3.6	0.5
24	PADS Software	-	0.2	0.2	15.4	0.4
25	ICL	0.2	0.2	0.2	-21.1	0.3
26	ULTImate Technology	0.2	0.2	0.1	-17.0	0.3
27	Computervision	0.9	0.3	0.1	-63.0	0.3
28	Design Acceleration	-	-	0.1	NA	0.2
29	ISDATA	0	0.1	0.1	26.4	0.1
30	Star Informatic	-	0.1	0.1	-	0.1
	Other Companies	5.4	6.1	8.1	32.0	17.6
	All N.A. Companies	27.3	24.3	31.3	29.0	68.3
	All European Companies	3.1	4.1	3.7	-10.0	8.1
	All Asian Companies	4.1	2.9	2.7	-5.4	6.0
	All Companies	39.9	37.4	45.8	22.5	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-6
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 UK Software Companies, Electronic CAE, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Mentor Graphics	2.9	2.6	4.3	62.5	13.6
2	Viewlogic Systems	1.9	2.4	4.2	72.7	13.2
3	Cadence	6.0	3.6	3.9	6.1	12.2
4	Synopsys	1.8	3.2	3.4	7.5	10.8
5	Autodesk	1.2	1.2	1.2	-1.2	3.7
6	Hewlett-Packard	0.9	0.9	1.0	7.9	3.2
7	i-Logix	-	0.8	1.0	29.6	3.1
8	Zycad	0.3	0.7	1.0	46.3	3.0
9	VLSI Libraries	-	-	0.8	NA	2.4
10	Intergraph	1.0	0.7	0.7	-8.8	2.1
11	Harris EDA	0.4	0.4	0.5	43.2	1.7
12	MacNeal-Schwendler	0.2	0.1	0.5	315.2	1.7
13	Zuken-Redac	1.8	1.0	0.4	-60.9	1.3
14	COMPASS Design Automation	0.5	0.3	0.3	-16.2	0.9
15	Abstract Hardware	1.0	1.5	0.3	-81.6	0.9
16	Aucotec	0	0.1	0.3	212.5	0.8
17	Wiechers Datentechnik	-	0.1	0.2	120.6	0.8
18	Norlinvest Ltd.	0.1	0.1	0.2	80.0	0.6
19	Sagantec	-	-	0.2	NA	0.5
20	Design Acceleration	-	-	0.1	NA	0.2
21	ISDATA	0	0.1	0.1	26.4	0.2
22	Star Informatic	-	0.1	0.1	-	0.2
23	InterHDL	-	-	0	NA	0.2
24	Intusoft	-	-	0	NA	0.1
25	ALS Design	-	-	0	NA	0.1
26	Kloeckner-Moeller	0	0	0	100.0	0.1
27	PADS Software	-	0	0	-24.2	0
	Other Companies	4.7	5.5	7.1	30.4	22.6
	All N.A. Companies	17.2	17.0	22.8	34.2	72.1
	All European Companies	1.1	1.9	1.3	-33.0	4.0
	All Asian Companies	1.8	1.0	0.4	-60.9	1.3
	All Companies	24.8	25.3	31.6	24.5	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-7
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 UK Software Companies, IC Layout, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Cadence	3.6	2.4	2.7	10.7	51.1
2	Mentor Graphics	0.4	0.4	1.0	155.3	19.9
3	Sagantec	0.7	0.8	0.6	-17.9	12.0
4	COMPASS Design Automation	0.4	0.2	0.2	19.8	4.5
5	Summitt Design	0.3	0.2	0.2	3.6	4.2
6	Intergraph	0.1	0.1	0.1	-19.3	1.4
7	Silicon Valley Research	0.4	0.1	-	-100.0	-
	Other Companies	0.1	0.2	0.4	81.1	6.9
	All N.A. Companies	5.0	3.4	4.2	25.4	81.1
	All European Companies	0.7	0.8	0.6	-17.9	12.0
	All Asian Companies	-	-	-	NA	-
	All Companies	5.8	4.3	5.2	20.4	100.0

NA = Not applicable
*Company statistics contain VAR/distributor revenue not counted in total
Source: Dataquest (August 1995)

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Table A-8
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 UK Software Companies, PCB/MCM/Hybrid, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Zuken-Redac	2.3	1.9	2.3	25.6	25.8
2	Mentor Graphics	1.3	1.1	1.8	65.4	19.7
3	Norlinvest Ltd.	0.7	0.8	1.3	48.8	13.8
4	Harris EDA	1.2	1.2	1.0	-10.4	11.4
5	Cadence	0.6	0.5	0.5	-4.0	5.8
6	Intergraph	1.1	0.5	0.4	-30.0	3.9
7	IBM	0.3	0.2	0.3	65.5	3.7
8	Altium*	0.3	0.2	0.3	65.5	3.7
9	CAD-UL	0.2	0.2	0.2	21.1	2.7
10	PADS Software	-	0.2	0.2	20.5	2.1
11	ICL	0.2	0.2	0.2	-21.1	1.7
12	ULTImate Technology	0.2	0.2	0.1	-17.0	1.7
13	Computervision	0.6	0.3	0.1	-63.0	1.3
14	ALS Design	0	0	0	-71.0	0.1
	Other Companies	0.4	0.4	0.6	54.3	6.5
	All N.A. Companies	5.0	3.9	4.3	9.7	47.8
	All European Companies	1.3	1.5	1.8	24.4	19.9
	All Asian Companies	2.3	1.9	2.3	25.6	25.8
	All Companies	9.0	7.6	9.1	18.6	100.0

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-9
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 UK Software Companies, All Applications, UNIX

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Computervision	32.6	25.9	30.1	16.3	14.6
2	Parametric Technology	3.6	7.9	12.8	62.5	6.2
3	Intergraph	17.3	13.5	9.9	-26.6	4.8
4	ICL	9.9	10.5	9.9	-6.0	4.8
5	IBM	4.3	7.6	9.6	26.4	4.7
6	EDS Unigraphics	6.6	6.1	9.3	53.3	4.5
7	Radan Computational	8.2	8.4	8.2	-2.0	4.0
8	Smallworld Systems	2.6	5.5	7.3	32.3	3.5
9	Cadence	10.0	6.6	7.0	6.9	3.4
10	Mentor Graphics	4.5	4.1	7.0	71.7	3.4
11	Sysdeco Innovation	2.0	6.4	6.2	-2.5	3.0
12	Hewlett-Packard	5.0	6.4	6.1	-4.6	3.0
13	SDRC	4.0	4.2	5.4	30.4	2.6
14	ESRI	2.6	3.2	5.4	67.5	2.6
15	MacNeal-Schwendler	3.2	4.6	4.9	6.3	2.4
16	Dassault*	1.6	1.6	4.7	197.2	2.3
17	PAFEC	4.5	3.7	3.5	-6.2	1.7
18	Synopsys	1.8	3.2	3.4	7.5	1.6
19	CAD Centre	2.7	2.4	3.3	37.3	1.6
20	Matra Datavision	1.9	2.2	3.0	37.4	1.4
21	Laser-Scan	2.8	3.3	2.9	-13.3	1.4
22	Zuken-Redac	3.5	2.5	2.7	9.3	1.3
23	Engineering Computer Services*	2.7	2.5	2.4	-4.8	1.2
24	Delcam International	4.7	2.2	2.3	4.5	1.1
25	MOSS Systems Group	3.0	1.9	2.1	11.9	1.0
26	Siemens Nixdorf Info systeme	2.6	1.6	1.9	18.4	0.9
27	Formtek	0.7	1.0	1.8	81.4	0.9
28	Applicon	2.7	2.1	1.8	-15.0	0.9
29	Viewlogic Systems	1.3	1.5	1.8	22.4	0.9
30	CIMLINC	1.2	1.3	1.5	17.3	0.7
	Other Companies	11.5	14.2	17.3	21.9	8.4
	All N.A. Companies	111.2	109.2	130.3	19.4	63.3
	All European Companies	50.5	54.6	55.6	1.8	27.0
	All Asian Companies	3.5	2.5	2.7	9.3	1.3
	All Companies	176.6	180.4	205.9	14.1	100.0

*Company statistics contain VAR/distributor revenue not counted in total
Source: Dataquest (August 1995)

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Table A-10
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 UK Software Companies, All Applications, NT/Hybrid

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Intergraph	-	0.2	4.3	1,663.2	68.6
2	Parametric Technology	-	-	1.4	NA	22.6
3	ESRI	-	-	0.3	NA	5.6
4	Mentor Graphics	-	-	0.1	NA	0.9
5	Intusoft	-	-	0	NA	0.4
6	EA Systems	-	-	0	NA	0.4
7	IEZ	-	-	0	NA	0.3
8	PCI Remote Sensing Corp	-	-	0	NA	0.3
9	InterHDL	-	-	0	NA	0
	Other Companies	-	0	0.1	35.5	0.9
	All N.A. Companies	-	0.2	6.2	2,440.2	98.8
	All European Companies	-	-	0	NA	0.3
	All Asian Companies	-	-	-	NA	-
	All Companies	-	0.3	6.3	2,096.9	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-11
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 UK Software Companies, All Applications, Personal Computer

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Autodesk	18.7	18.5	21.1	14.0	31.2
2	Intergraph	3.2	4.6	5.1	10.7	7.5
3	Engineering Computer Services*	2.3	3.0	4.5	51.2	6.6
4	Computer Services Consultants	4.0	4.0	4.2	4.5	6.2
5	RoboCAD Solutions	2.8	2.9	3.2	8.4	4.7
6	Ground Modelling Systems	2.0	1.5	2.6	69.7	3.8
7	Whessoe Computing Systems	2.0	2.2	2.5	13.6	3.7
8	Viewlogic Systems	0.6	1.0	2.4	149.4	3.5
9	MapInfo	0.3	0.9	1.9	97.4	2.8
10	ESRI	0.6	1.1	1.7	57.6	2.5
11	Computervision	1.3	1.1	1.6	48.8	2.3
12	Anilam Electronics	1.1	1.2	1.4	18.0	2.1
13	Norlinvest Ltd.	0.7	0.9	1.4	52.1	2.1
14	Elstree Computing	1.2	1.1	1.2	4.5	1.7
15	Pathtrace Engineering Systems	0.9	0.8	1.0	32.0	1.5
16	PAFEC	1.1	0.8	0.9	13.8	1.3
17	IBM	1.6	1.1	0.9	-22.2	1.3
18	Altium*	1.6	1.1	0.9	-22.2	1.3
19	Formtek	0.3	0.4	0.8	81.4	1.2
20	Superdraft	0.9	0.7	0.7	4.1	1.1
21	MCS	0.4	0.5	0.7	45.9	1.0
22	Siemens Nixdorf Info systeme	-	0.4	0.6	39.9	0.8
23	Rebis	-	-	0.5	NA	0.7
24	Hewlett-Packard	0.1	0.1	0.5	680.3	0.7
25	Vero International Software	0.4	0.3	0.5	45.3	0.7
26	Cimtel	1.0	1.0	0.5	-55.0	0.7
27	Soft-Tech Software Technologies	0.3	0.3	0.4	22.6	0.6
28	Investronica SA	0.3	0.3	0.4	52.0	0.6
29	Graphisoft Group	0.1	0.1	0.3	123.2	0.5
30	Ansys	0.3	0.3	0.3	9.1	0.5
	Other Companies	3.6	3.5	4.6	31.6	6.8
	All N.A. Companies	28.8	31.7	39.5	24.5	58.3
	All European Companies	22.9	22.3	23.6	5.9	34.9
	All Asian Companies	0.6	0.4	0.1	-87.7	0.1
	All Companies	55.9	57.9	67.7	16.9	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-12
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 UK Software Companies, All Applications, Host/Proprietary

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	IBM	3.7	2.9	3.1	7.0	38.3
2	MacNeal-Schwendler	2.9	2.7	2.1	-20.2	26.1
3	Dassault*	1.0	0.7	1.6	140.0	20.0
4	GDS	4.5	1.8	1.3	-28.1	15.9
5	ESRI	0	0.2	0.3	59.0	4.3
6	Siemens Nixdorf Info systeme	0.4	0.7	0.3	-57.3	3.4
7	Whessoe Computing Systems	0.6	0.3	0.2	-17.2	3.0
8	Exapt	0.2	0.2	0.2	37.5	2.7
9	Ansys	0.3	0.2	0.1	-35.8	1.8
10	Computational Mechanics	1.0	0.2	0.1	-16.3	1.7
11	Mechanical Dynamics	-	0.1	0.1	18.0	0.8
12	Cimtel	-	-	0	NA	0.4
13	EA Systems	-	0	0	-43.8	0.3
14	PCI Remote Sensing Corp	-	0	0	16.4	0.2
15	Harris EDA	0.1	0	0	-66.7	0.1
16	Access Corp.	-	-	0	NA	0.1
17	GRAFTEK	0	0	0	-11.1	0.1
18	EDS Unigraphics	-	1.3	-	-100.0	-
19	Intergraph	-	0.2	-	-100.0	-
20	FEA	0.1	0.1	-	-100.0	-
21	ICEM Technologies	0.1	0.1	-	-100.0	-
22	Lamp Software	0	0.1	-	-100.0	-
23	SDRC	0.1	0	-	-100.0	-
	Other Companies	0.7	0.3	0.1	-72.4	0.9
	All N.A. Companies	12.3	9.4	7.1	-24.3	87.9
	All European Companies	2.8	1.5	0.9	-39.8	11.2
	All Asian Companies	-	-	-	NA	-
	All Companies	15.7	11.2	8.1	-27.6	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table B-1
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All UK Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Abstract Hardware	1.0	1.5	0.3	-81.6	0.1
2	Access Corp.	-	-	0	NA	0
3	ADRA Systems	-	0.1	0.2	11.5	0.1
4	ALS Design	0	0	0	17.0	0
5	Altium*	1.6	1.1	0.9	-22.2	0.3
6	Anilam Electronics	1.1	1.2	1.4	18.0	0.5
7	Ansys	1.4	1.3	1.4	9.1	0.5
8	APIC Systemes	0.3	0.4	0.5	19.7	0.2
9	Applicon	2.7	2.1	1.8	-12.2	0.6
10	ASHLAR	0	0	0.1	190.3	0
11	Aucotec	0	0.1	0.3	212.5	0.1
12	Autodesk	19.9	19.7	22.5	14.0	7.8
13	B.A.Intelligence Networks	0.1	0.2	0.2	56.7	0.1
14	CAD Centre	2.7	2.4	3.3	37.3	1.1
15	CAD Lab	0.1	0.1	0.1	29.2	0
16	CAD-Capture	0.6	0.3	-	-100.0	-
17	CAD-UL	0.2	0.2	0.2	21.1	0.1
18	Cadence	10.2	6.6	7.0	6.9	2.5
19	CAMAX Manufacturing	-	0.1	0.3	190.6	0.1
20	CAMTEK	0.8	0.9	-	-100.0	-
21	CIMLINC	1.2	1.3	1.5	17.3	0.5
22	Cimplex	0.1	0.2	0.2	0	0.1
23	Cimtel	1.0	1.0	0.8	-15.4	0.3
24	CNC Software	0.1	0.1	0.1	27.1	0
25	COMPASS Design Automation	0.9	0.5	0.5	-3.0	0.2
26	Computational Mechanics	1.4	0.5	0.5	3.0	0.2
27	Computer Services Consultants	4.0	4.0	4.2	4.5	1.5
28	Computervision	34.2	27.0	31.7	17.6	11.0
29	Contract Data Research	0.6	0.3	-	-100.0	-
30	Dassault*	2.6	2.2	6.3	180.0	2.2
31	Delcam International	5.3	2.2	2.4	6.3	0.8
32	Design Acceleration	-	-	0.1	NA	0
33	DP Technology	0	0	0	13.5	0
34	EA Systems	-	0.1	0.1	-10.0	0
35	EDS Unigraphics	6.6	7.3	9.3	27.1	3.2
36	Elstree Computing	1.2	1.1	1.2	4.5	0.4
37	Enghouse Systems Ltd.	0.3	0.3	0.3	1.1	0.1
38	Engineering Computer Services*	4.9	5.5	6.9	25.5	2.4
39	ESRI	3.2	4.5	7.7	72.5	2.7
40	Exapt	0.3	0.2	0.3	26.1	0.1

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All UK Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
41	FEA	0.7	0.8	-	-100.0	-
42	FEGS	0.8	0.7	-	-100.0	-
43	Formtek	0.9	1.5	2.6	81.4	0.9
44	Gable CAD Systems	0.6	0.6	0.4	-36.1	0.1
45	GDS	5.9	2.4	2.4	-0.9	0.8
46	Genasys II	1.0	1.0	1.1	4.9	0.4
47	Gerber Systems	0.3	0.1	0.1	64.0	0
48	GRAFTEK	0	0	0	7.1	0
49	Graphisoft Group	0.1	0.1	0.3	123.2	0.1
50	Ground Modelling Systems	2.0	1.5	2.6	69.7	0.9
51	Han Dataport	0.1	0.1	0.1	55.7	0
52	Harris EDA	1.5	1.5	1.6	2.6	0.5
53	Hewlett-Packard	5.1	6.5	6.6	1.7	2.3
54	Hochtief	0	0	0.1	65.5	0
55	i-Logix	-	0.8	1.0	29.6	0.3
56	IBM	9.7	11.6	13.6	17.0	4.7
57	ICEM Technologies	0.2	0.3	0.3	18.6	0.1
58	ICL	9.9	10.5	9.9	-6.0	3.4
59	IEZ	-	-	0.4	NA	0.1
60	Intergraph	20.5	18.5	19.3	4.3	6.7
61	InterHDL	-	-	0	NA	0
62	Intusoft	-	-	0	NA	0
63	Investronica SA	0.3	0.3	0.4	52.0	0.1
64	ISD Software	0.3	0.2	0.3	8.2	0.1
65	ISDATA	0	0.1	0.1	26.4	0
66	Isicad	1.6	1.0	0.4	-56.2	0.2
67	Kloeckner-Moeller	0	0	0	33.3	0
68	Lamp Software	1.0	1.0	-	-100.0	-
69	Laser-Scan	3.0	3.3	2.9	-13.3	1.0
70	Livermore Software Tech.	0.1	0.1	0.1	48.6	0
71	MacNeal-Schwendler	6.1	7.3	7.0	-4.0	2.4
72	MapInfo	0.3	1.0	2.0	101.5	0.7
73	Matra Datavision	1.9	2.2	3.0	37.8	1.0
74	MCS	0.9	1.0	1.0	2.7	0.3
75	Mechanical Dynamics	-	0.4	0.4	20.0	0.2
76	Mentor Graphics	4.5	4.1	7.1	72.4	2.5
77	MOSS Systems Group	3.0	2.0	2.3	18.1	0.8
78	Norlinvest Ltd.	0.7	0.9	1.4	52.1	0.5
79	PADS Software	-	0.2	0.2	15.4	0.1
80	PAFEC	5.6	4.5	4.4	-2.7	1.5

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All UK Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
81	Parametric Technology	3.6	8.2	14.2	72.4	4.9
82	Pathtrace Engineering Systems	0.9	0.8	1.0	31.6	0.3
83	PCI Remote Sensing Corp	-	0.3	0.3	16.4	0.1
84	Radan Computational	8.3	8.5	8.4	-1.2	2.9
85	Rebis	-	-	0.5	NA	0.2
86	RoboCAD Solutions	2.8	2.9	3.2	8.4	1.1
87	Sagantec	0.7	0.8	0.8	2.6	0.3
88	SDRC	4.2	4.2	5.4	29.1	1.9
89	Siemens Nixdorf Info systeme	3.0	2.7	2.8	3.1	1.0
90	Silicon Valley Research	0.4	0.1	-	-100.0	-
91	Smallworld Systems	2.6	5.5	7.3	32.3	2.5
92	Soft-Tech Software Technologies	0.3	0.3	0.4	22.6	0.1
93	Star Informatic	0.1	0.7	0.8	11.8	0.3
94	Strategic Mapping	-	0.1	0.1	18.8	0
95	Summitt Design	0.3	0.2	0.2	3.6	0.1
96	Superdraft	0.9	0.7	0.7	4.1	0.3
97	Synopsys	1.8	3.2	3.4	7.5	1.2
98	Sysdeco Innovation	2.2	6.4	6.2	-2.5	2.2
99	Tebis	-	-	0.1	NA	0
100	Technische Computer Systeme	0.1	0.1	0.2	50.0	0.1
101	Terr-Mar Resource Info Svs	-	0.1	0.1	-10.8	0
102	ULTImate Technology	0.2	0.2	0.1	-17.0	0.1
103	UNISYS	0.6	0.7	1.0	40.0	0.3
104	Variation Systems Analysis	-	0	0	100.0	0
105	Vero International Software	0.4	0.3	0.5	45.3	0.2
106	Viewlogic Systems	1.9	2.4	4.2	72.7	1.4
107	VLSI Libraries	-	-	0.8	NA	0.3
108	Whessoe Computing Systems	2.9	2.9	3.2	10.5	1.1
109	Wiechers Datentechnik	-	0.1	0.2	120.6	0.1
110	Zuken-Redac	4.1	2.9	2.7	-5.4	1.0
111	Zycad	0.3	0.7	1.0	46.3	0.3
	Other Companies	15.7	17.7	21.6	21.9	7.5
	All N.A. Companies	152.3	150.5	183.1	21.7	63.7
	All European Companies	76.2	78.4	80.1	2.2	27.9
	All Asian Companies	4.1	2.9	2.7	-5.4	1.0
	All Companies	248.2	249.6	287.6	15.2	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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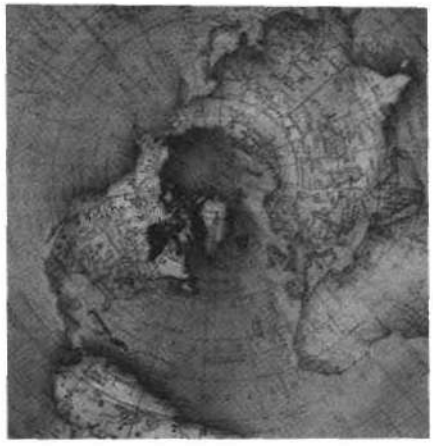
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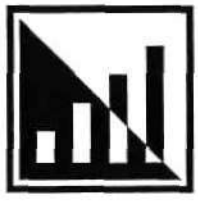
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1994 CAD/CAM/CAE/GIS Rest of Europe Market Share Update



Market Statistics

Program: CAD/CAM/CAE/GIS Europe
Product Code: CCAM-EU-MS-9503
Publication Date: September 25, 1995
Filing: Market Analysis

1994 CAD/CAM/CAE/GIS Rest of Europe Market Share Update



Market Statistics

Program: CAD/CAM/CAE/GIS Europe
Product Code: CCAM-EU-MS-9503
Publication Date: September 25, 1995
Filing: Market Analysis

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Note: All tables show estimated data.

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Note: All tables show estimated data.

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1994 CAD/CAM/CAE/GIS Rest of Europe Market Share Update

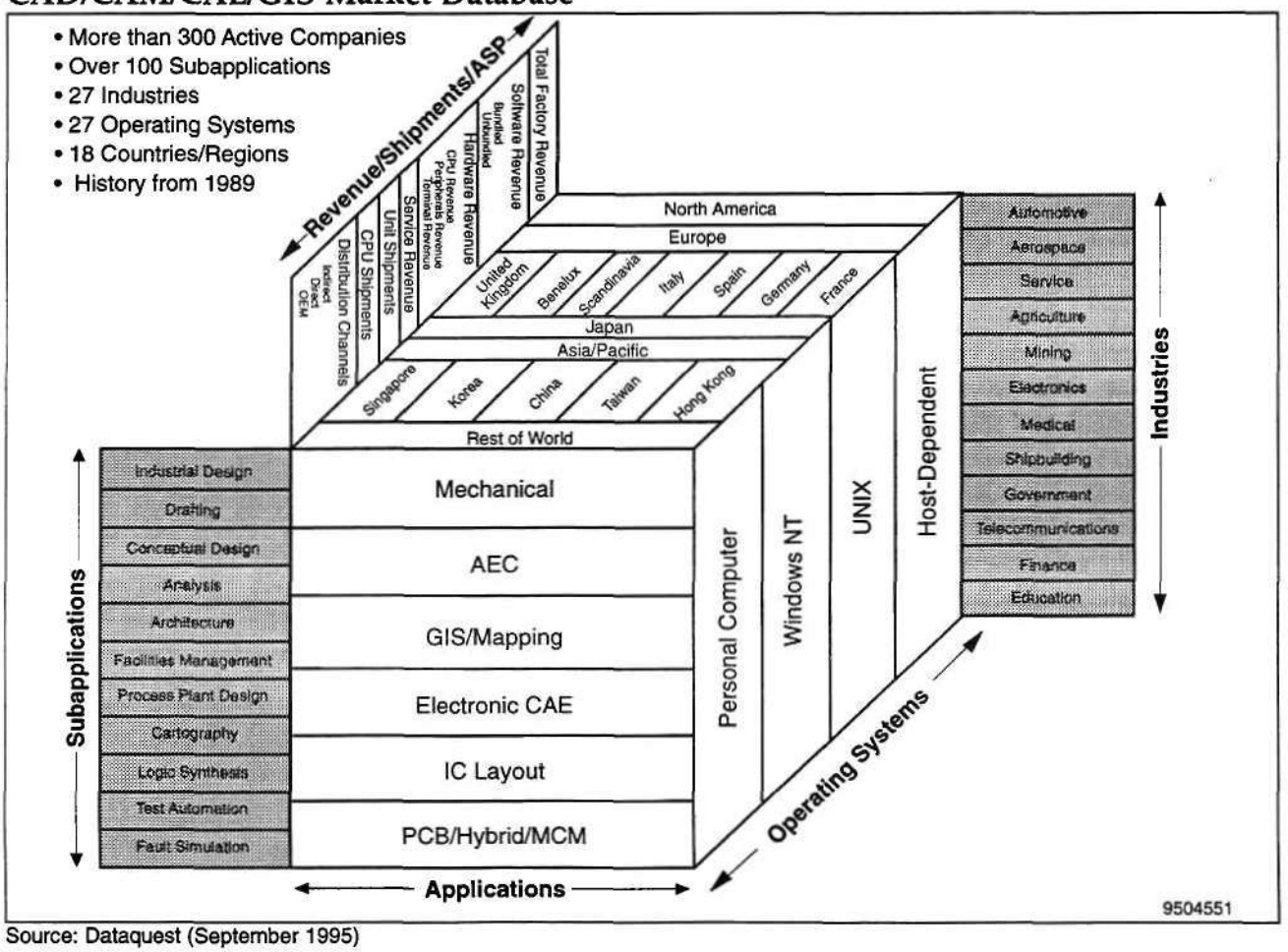
Introduction

CAD/CAM/CAE/GIS systems have dramatically changed the methods by which designers and production managers originate and implement products. CAD and CAE systems allow designers to create, draft, analyze, test, and manipulate products on a screen in two and three dimensions. As CAD/CAM/CAE/GIS systems continue to decrease in cost, they become more available and cost-justifiable to new users.

In order to provide a comprehensive view of the CAD/CAM/CAE/GIS industry, Dataquest's CAD/CAM/CAE/GIS group maintains a large database of industry information. The type of information contained in the database is depicted in Figure 1.

Table 1 summarizes the performance in various segments of the CAD/CAM/CAE/GIS markets in 1994 versus 1993.

Figure 1
CAD/CAM/CAE/GIS Market Database



Source: Dataquest (September 1995)

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Table 1
CAD/CAM/CAE/GIS Market Summary, 1993 to 1994

	Software Revenue		1993-1994	Total Factory Revenue		1993-1994	Seat Shipments		1993-1994
	1993	1994	Growth (%)	1993	1994	Growth (%)	1993	1994	Growth (%)
Applications									
Mechanical	2,248.9	2,455.5	9.2	7,374.9	7,968.8	8.1	279,480	298,442	6.8
AEC	752.3	849.0	12.9	2,204.7	2,401.1	8.9	198,114	211,550	6.8
GIS/Mapping	793.1	917.2	15.7	2,129.2	2,420.9	13.7	88,672	108,107	21.9
Electronic CAE	803.3	886.3	10.3	2,297.0	2,482.2	8.1	94,651	108,019	14.1
IC Layout	180.8	216.9	20.0	601.0	721.7	20.1	10,911	12,740	16.8
PCB/MCM/Hybrid	244.0	252.1	3.3	789.8	788.3	-0.2	29,042	27,766	-4.4
Electronic Design Automation	1,228.0	1,355.2	10.4	3,687.8	3,992.2	8.3	134,604	148,525	10.3
All Applications	5,022.3	5,577.0	11.0	15,396.6	16,782.9	9.0	700,869	766,623	9.4
Region									
North America	1,856.7	2,045.6	10.2	5,614.9	6,189.1	10.2	312,240	343,290	9.9
Europe	1,660.3	1,864.4	12.3	5,272.8	5,750.2	9.1	237,945	258,480	8.6
Japan	1,203.4	1,315.8	9.3	3,728.1	3,909.9	4.9	99,963	102,239	2.3
Asia/Pacific	208.0	255.4	22.8	538.2	676.9	25.8	33,753	44,643	32.3
Rest of World	93.9	95.8	2.0	242.6	256.9	5.9	16,968	17,971	5.9
Worldwide	5,022.3	5,577.0	11.0	15,396.6	16,782.9	9.0	700,869	766,623	9.4
Operating System									
UNIX	3,466.6	3,874.3	11.8	10,861.7	11,946.9	10.0	192,244	221,152	15.0
Host	301.4	197.9	-34.3	1,616.0	1,269.4	-21.5	27,091	21,566	-20.4
Windows NT	5.5	106.4	1,845.3	10.3	282.7	2,644.1	226	6,764	2,892.9
PC	1,248.9	1,398.3	12.0	2,908.5	3,283.9	12.9	481,308	517,141	7.4
All Operating Systems	5,022.3	5,577.0	11.0	15,396.6	16,782.9	9.0	700,869	766,623	9.4

Note: This table includes software content (data) companies for GIS/mapping. However, the AEC and GIS market share book (*1994 CAD/CAM/CAE/GIS AEC and GIS Market Share*, CAEC-WW-MS-9501) does not.
Source: Dataquest (September 1995)

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About This Document

This document contains Dataquest's detailed market share information on the CAD/CAM/CAE/GIS industry. The following list contains descriptions of the companies included in the Market Share books. See Tables 2, 3, 4, and 5 for changes from our 1993 report.

- Mechanical applications—All companies in database with mechanical revenue
- GIS and AEC applications—All companies in database with GIS revenue and all companies in database with AEC revenue. We also have added GIS data companies.
- Electronic design automation applications—All companies in database with EDA (electronic CAE, IC layout, PCB/hybrid/MCM) revenue
- Europe overview—All companies with European revenue
- Asia—All companies with Asian revenue

We no longer publish top-level market statistics for the entire CAD/CAM/CAE/GIS industry. This data is available by calling Suzanne Snygg at (408) 468-8124. More detailed data on these markets may be requested through our client inquiry service.

We no longer publish data by hardware platform; instead we report by four major operating systems: UNIX, host, Windows NT, and PC.

This document represents our final estimates of 1994 shipments and revenue.

Dataquest's policy is to continually update its market information, for current and past years, with any new data received in order to arrive at the most accurate market representation possible.

Table 2
Companies Renamed Since 1993

Original Company Name	New Company Name
ACDS Graphic System	Geomax International
Genrad	VEDA
GeoVision	SHL Systemhouse
Graphisoft Software Dev	Graphisoft Group
ICAD	Concentra
Kohns & Poppenhaeger	Poppenhaeger Grips GmbH
Microway	M.O.C.
Scientific & Engineering Software	SES Inc.
Silvar-Lisco	SVRI (Silicon Valley Research Inc.)
Smallworld Systems	SmallworldWide
Swanson Analysis	Ansys
Tactics International	Tactician Corporation

Source: Dataquest (September 1995)

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Table 3
Companies (or CAD Portions of Companies) Sold/Merged in 1994

Company Name	Acquired by/Merged with
Aries Technology	MacNeal-Schwendler
ANACAD-EES	Mentor Graphics
Betronex & Visionics	Norlinvest Ltd.
Cisigraph	Matra
Digital—Mechanical Software	PROCAD GmbH
Chronological Simulation	Viewlogic
Computervision—GIS	Unisys
Control Data—Mechanical Software	ICEM Technologies
Foresight Resources	Softdesk
Generation 5 Technology	Geo/SQL Corporation
Gerber Systems (CAD portion)	Matra
Kork Systems	Autometric
LandCadd	Eagle Point
Logic Modeling Corp.	Synopsys
Massteck	OrCAD
Model Technology	Mentor Graphics
NeoCAD	Xilinx
PDA Engineering	MacNeal-Schwendler
Point Control	CAMAX Manufacturing
Racal-Redac	Zuken-Redac
Sunrise	Viewlogic
Syscan	Sysdeco Innovation

Source: Dataquest (September 1995)

Table 4
Companies Deleted from Database Since 1993

Region/Company	
North American	European
A.I. Systems	Aplein*
Apple Computer	Aucos elektronische
Aura CAD/CAM Systems	BATISOFT
CAE-link	CAD-Capture
Claris	CAD TECH Iberica*
Compact Software	CAMTEK
Control Data—Hardware	Caroline Informatique
Data General	Contract Data Research
ECOM Associates	Data Technology/DATECH*
Georgia Tech Research	Datagraphic
GEOVISION Inc.	DELTA CAD*
Infinite Graphics	EME

(Continued)

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Table 4
Companies Deleted from Database Since 1993 (Continued)

Region/Company	
North American (Continued)	European (Continued)
Innovative Data Design	FEA
Intrinsix	FEGS
Land Innovation	ItalCad
Maptech	Kreon
MC2 Engineering Software	Lamp Software
Moda CAD	Logic Systems Designers*
Phase Three Logic	Macao Systems
Synercom	MEDESIGN
Teradyne	Mucke Software
Understanding Systems	S.T.L.D.s.r.l.
Asian	Soft*
Kanematsu Semiconductor*	

*Distributors
Source: Dataquest (September 1995)

Table 5
Companies Added to Database Since 1993

Region/Company	
North American	European
3Soft	Abstract Hardware
Access Corp.	ACA Ltd.
ArcSys	Cimtel Ltd.
B.A. Intelligence Networks	Eigner + Partner GmbH
Boothroyd Dewhurst	HoSoft CAD
Cadis Software	Speed
CGTech	Spot Image Corp.
Chronology	ULTimate Technology
Cimplex	WiN Technology
Claritas/NPDC	
CMstat	
CSAR Corp.	
Database Applications Inc.	
Deneb Robotics	
DB Technology	
Design Acceleration	
Eagle Point	
EOSAT	
Equifax/NDS	
Fintronic	
Formtek	
Geographic Data Technology	
Gibbs and Assoc.	

(Continued)

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Table 5
Companies Added to Database Since 1993 (Continued)

Region/Company
North American (Continued)
Integrity Engineering
InterHDL
Intusoft
Livermore Software Tech. Corp.
Nextwave DA
NOVASOFT Systems
OEA International
Optem Engineering
Rebis (merger of EDA and ADev)
Sherpa Corp.
Simulation Technology
SRAC
Surfware
T D Technology
Tecnomatics Tech.
UniCAD
Variation Systems Analysis
Veritools
VISTA Environmental Inf.
Workgroup Tech

*Distributors
Source: Dataquest (September 1995)

Segmentation Definitions

This section lists the definitions specific to this document. The following paragraphs define the segments.

Applications

Mechanical

The mechanical segment refers to computer-aided tools used by engineers, designers, analysts, technicians, and draftspeople working predominantly in the discrete manufacturing industries, but includes government and education. Users of mechanical CAD/CAM/CAE tools work in all departments across the typical organization, with a majority found in product design, advanced engineering, and manufacturing engineering. Common design applications include conceptual design, industrial design, structural or thermal analysis, detail design, and electromechanical design (the mechanical part of design with electrical or electronic components and mechanisms). Common manufacturing applications include tool and fixture design, numerical control part programming, offline robotics programming, and interface to quality control systems. Management tools for database control and distribution are included in this segment, as well as user-defined application programming.

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Architecture, Engineering, and Construction (AEC)

The AEC segment covers the use of computer-aided tools by architects, contractors, plant engineers, civil engineers, and other people associated with these disciplines to aid in designing and managing buildings, industrial plants, ships, and other types of nondiscrete entities.

Geographic Information Systems (GIS)/Mapping

GIS is computer-based technology, and the segment comprises hardware, software, and data used to capture, edit, display, and analyze spatial (tagged by location) information.

Electronic Design Automation (EDA)

The EDA segment covers computer-based tools used to automate the design of an electronic product, including printed circuit boards, ICs, and systems. EDA includes ECAE, IC layout, and PCB/hybrid/MCM, as follows:

- Electronic computer-aided engineering (ECAE)—These are computer-aided tools used in the engineering or design phase of electronic products (as opposed to the physical layout phase of the product). Examples of electronic CAE applications are schematic capture and simulation.
- IC layout—This is a software application tool used to create and validate the physical implementation of an IC. The IC layout category comprises polygon editors, symbolic editors, placement and routing (gate array, cell, and block), and design verification tools (DRC/ERC/logic-to-layout).
- PCB/hybrid/MCM—This segment covers products used to create the placement and routing of the traces and components laid out on a printed circuit board. Also included in this category are thermal analysis tools.

Regions

The following paragraphs define the regions.

North America

North America includes the United States, Mexico, and Canada.

Europe

Europe includes the United Kingdom, Scandinavia, Benelux, France, Germany, Italy, Spain, and Rest of Europe.

Japan

Asia/Pacific

Asia includes Singapore, Taiwan, Korea, China, and Hong Kong.

Rest of World

Rest of World includes all other countries including Australia, New Zealand, India, Africa, Central America, South America, and the Middle East.

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Operating Systems

Dataquest defines the operating systems as follows:

- UNIX: UNIX includes all UNIX variants and older workstation operating systems.
- Host: Host includes minicomputer and mainframe operating systems in which the functions of external workstations are dependent on a host computer.
- Windows NT: Windows NT is the Microsoft operating system. We understand that code for Windows NT and Windows will be merged within the next three years. The probability is high that Microsoft will develop a client environment and a server environment. In our forecast, the future client environment is included in PC operating systems, and the future server environment is referenced as NT. Also included in NT is potential for an additional, new, high-end operating environment that could be developed by any vendor.
- PC: PC includes DOS, Windows, Windows 95, and Apple operating systems.

Metrics

The following paragraphs define measurements:

- Total factory revenue is defined as the amount of money received by a manufacturer for its goods and services measured in U.S. dollars. Total factory revenue does not include revenue that a company may receive from products that are sold to another company for resale (OEM revenue). Total factory revenue is the sum of software revenue, hardware revenue, and service revenue.
- Unit shipment is defined as the number of seats delivered (number of possible simultaneous users of product delivered) excluding OEM shipments.
- Hardware revenue is revenue derived from sales of CPUs (including operating systems), terminals (for host-dependent systems), and peripherals.
- Software revenue is revenue derived from the sale of application software that exists on a company's standard price list.
- Service revenue is defined as all revenue derived from the service and support of CAD/CAM/CAE/GIS systems. Service revenue can be calculated in the tables by subtracting hardware and software revenue from total revenue. A split by hardware service and software service is available through inquiry.
  - Maintenance fees for hardware and software
  - Management and operations services—help desk, education and training, disaster recovery, vaulting, and configuration management

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- Service bureau—project work, including construction of database, data conversion, product design, analysis, or manufacturing
- Application development—design and development of customized software applications or the modification, enhancement of customization of existing software applications, adding new functionality
- Consulting revenue—assessment of CAD/CAM/CAE/GIS business and information technology needs and the formulation of a plan based on needs identification
- Implementation and integration services—planning, implementation, migration, and integration of software products (software network support and integration, account integration management, data center design, and construction)

Market Share Methodology

Dataquest uses both primary and secondary sources to produce our market share data. In the fourth quarter of each year and second quarter of the subsequent year, we survey all participants in each industry. Each vendor is offered the opportunity to self-report the information required. Although there is a primary contact for each company, large companies are surveyed across product lines and across geographic regions. Thus there is a corresponding increase in the number of contacts at large companies. (Dataquest maintains a large contact database on all sources of information.) Examples of the job titles of people contacted for information are the following:

- President and CEO
- Vice president and general manager
- Vice president of marketing
- Vice president, strategic product planning
- Director of strategic planning
- Director of marketing
- Director of market development
- Manager, CAD/CAM/CAE/GIS marketing programs
- Market research analyst

The Audit Process

Data supplied by vendors is evaluated against information drawn from many sources, including the following:

- Revenue published by major industry participants
- Estimates made by knowledgeable and reliable industry spokespersons
- Government data or trade association data

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- Published product literature and price lists
- Interviews with knowledgeable manufacturers, distributors, and users
- Relevant economic data
- Information and data from online data banks
- Articles in both the general and trade press
- Annual reports, SEC documents, credit reports
- Company publications and press releases
- Reports from financial analysts
- User studies
- Reseller and supplier reports and reports from a vendor's competitors

Dataquest also sums vendor revenue across other industries covered by Dataquest to make sure that revenue is not credited twice, and checks with multiple sources at one company to cross-check data on that company.

Dataquest analysts have many years of experience in how to apply the tools described to get the most accurate information possible on a particular company (such as what to use when and what industry averages are). We believe that the estimates presented here are the most accurate and meaningful generally available today. It is the CAD/CAM/CAE/GIS group's policy to continually update our market information for any year, based on any new data received, in order to arrive at the most accurate market representation possible.

Dataquest's CAD/CAM/CAE/GIS market numbers are often higher than those reported by other sources. We survey worldwide, which involves more vendors, higher total market revenue, lower market share per vendor, and a more accurate market picture—which is particularly useful when comparing regions or applications.

Publishing Schedule

We publish market share and forecasting twice each year for each, allowing for both timely distribution of data and thorough analysis and forecasting. Our annual delivery schedule is as follows:

- Market share will be published and distributed to clients by March 31.
- Forecasting from the market share tables provides a five-year forecast period, available after April 30. The books will be shipped by May 31.
- Final updated market share tables, based on additional data collection and analysis, will be completed by June 30. At this point, the market share database is frozen and will not be changed until the end of the year. For the next six months, supplementary market data will be based on this final market data. Books will be shipped by July 31. (Unfortunately, because of our database changes, updated market share table delivery was delayed beyond this date.)

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- We provide complete final forecast tables by July 31. These tables take into consideration changes in the market share during the previous six months. Books will be shipped by September 31.

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Table A-1
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Benelux Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Autodesk	9.3	10.5	12.0	14.0	12.7
2	Intergraph	10.9	8.5	9.0	4.8	9.5
3	EDS Unigraphics	5.0	5.7	8.8	56.2	9.4
4	Parametric Technology	1.8	4.2	7.2	72.4	7.7
5	IBM	5.6	5.9	7.2	21.4	7.6
6	ESRI	2.6	4.6	3.9	-16.3	4.1
7	Star Informatic	2.4	3.2	3.5	9.1	3.7
8	Dassault*	0.9	2.2	3.1	40.0	3.3
9	Siemens Nixdorf Info systeme	3.0	2.7	2.7	1.0	2.9
10	IEZ	1.3	2.1	2.5	18.6	2.6
11	MacNeal-Schwendler	1.2	2.4	1.6	-31.8	1.7
12	Viewlogic Systems	0.8	1.0	1.6	56.9	1.7
13	Hochtief	0.7	0.8	1.5	83.9	1.6
14	Synopsys	0.7	1.3	1.4	7.5	1.5
15	Smallworld Systems	0.3	1.2	1.2	0.8	1.3
16	Genasys II	1.0	1.1	1.1	4.9	1.2
17	Mentor Graphics	0.6	0.3	1.0	195.5	1.1
18	Sener Inginiera y Sistemaus	1.0	1.1	1.0	-10.1	1.0
19	RoboCAD Solutions	0.6	0.6	1.0	52.3	1.0
20	ULTImate Technology	0.8	0.7	0.9	26.3	1.0
21	Formtek	0.3	0.5	0.9	81.4	0.9
22	SDRC	0.8	0.7	0.9	16.0	0.9
23	Wiechers Datentechnik	0.2	0.8	0.9	7.3	0.9
24	Cadence	1.2	0.8	0.8	6.9	0.9
25	Matra Datavision	1.1	1.0	0.8	-25.7	0.8
26	Sagantec	0.7	0.8	0.7	-3.9	0.8
27	Zuken-Redac	1.0	0.5	0.7	39.9	0.7
28	Hewlett-Packard	3.1	0.6	0.7	7.9	0.7
29	Computervision	4.4	0.9	0.6	-29.5	0.7
30	Zycad	0.1	0.3	0.6	93.7	0.7
	Other Companies	5.3	6.1	7.4	21.3	7.9
	All N.A. Companies	51.9	52.6	63.0	19.8	66.9
	All European Companies	18.5	21.5	23.1	7.3	24.5
	All Asian Companies	1.0	0.5	0.7	39.9	0.7
	All Companies	76.7	80.8	94.2	16.7	100.0

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-2
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Benelux Software Companies, Mechanical, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	EDS Unigraphics	5.0	5.7	8.8	56.2	21.9
2	Parametric Technology	1.8	4.2	7.2	72.4	18.0
3	IBM	4.4	4.9	6.0	23.6	14.9
4	Autodesk	3.7	4.2	4.8	14.3	11.9
5	Dassault*	0.8	2.2	3.1	40.1	7.6
6	MacNeal-Schwendler	1.2	2.4	1.5	-35.1	3.8
7	Intergraph	1.8	1.4	1.4	-0.9	3.4
8	SDRC	0.8	0.7	0.9	16.0	2.1
9	Formtek	0.3	0.5	0.8	80.3	2.1
10	Matra Datavision	1.1	1.0	0.8	-25.7	1.9
11	ASCAD	0.4	0.4	0.6	32.5	1.4
12	Ansys	0.1	0.5	0.5	9.1	1.4
13	ISD Software	0.5	0.5	0.5	8.2	1.3
14	Siemens Nixdorf Info systeme	0.6	0.5	0.5	-5.8	1.2
15	RoboCAD Solutions	0.2	0.3	0.5	52.3	1.2
16	Investronica SA	0.4	0.4	0.5	11.9	1.2
17	Cimatron	0.1	0.3	0.4	56.6	1.0
18	Computervision	3.7	0.5	0.4	-26.0	1.0
19	Applicon	0.5	0.3	0.3	-12.2	0.7
20	Han Dataport	0.3	0.2	0.3	25.6	0.7
21	Wiechers Datentechnik	0.2	0.2	0.3	14.5	0.6
22	CAMAX Manufacturing	-	0.1	0.2	190.6	0.6
23	CIMLINC	0.2	0.2	0.2	17.3	0.5
24	Altium*	0.5	0.3	0.2	-39.0	0.5
25	MCS	0	0	0.2	379.1	0.4
26	Radan Computational	0.2	0.2	0.2	-	0.4
27	Gerber Systems	0.3	0.3	0.1	-45.9	0.4
28	Delcam International	0.3	0.1	0.1	-22.5	0.3
29	Technische Computer Systeme	0.1	0.1	0.1	10.0	0.3
30	ASHLAR	0	0	0.1	161.3	0.3
	Other Companies	1.3	1.2	1.7	37.9	4.1
	All N.A. Companies	26.3	25.9	33.6	30.0	83.4
	All European Companies	5.5	4.9	5.0	1.8	12.5
	All Asian Companies	-	-	-	NA	-
	All Companies	33.1	32.0	40.3	25.9	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-3
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Benelux Software Companies, AEC, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Autodesk	4.0	4.5	5.2	15.6	25.5
2	Intergraph	4.4	3.9	4.1	6.6	20.1
3	IEZ	1.3	2.1	2.5	18.6	12.0
4	Hochtief	0.7	0.8	1.5	83.9	7.5
5	Star Informatic	0.8	1.0	1.1	1.9	5.1
6	Sener Inginiera y Sistemaus	1.0	1.1	1.0	-10.1	4.8
7	IBM	0.7	0.5	0.6	16.9	3.1
8	Nemetschek	-	-	0.6	NA	2.8
9	MOSS Systems Group	0	0.4	0.5	18.1	2.6
10	RoboCAD Solutions	0.4	0.3	0.5	52.3	2.3
11	Technische Computer Systeme	0.1	0.2	0.3	42.1	1.3
12	Rebis	-	-	0.3	NA	1.3
13	Graphisoft Group	0.2	0.1	0.3	167.8	1.3
14	Computervision	0.5	0.2	0.2	-0.7	1.0
15	RIB/Bausoftware	0	0.1	0.2	71.5	0.9
16	Ziegler Informatics	0	0.1	0.2	216.6	0.8
17	Kockums Computer Systems	0.4	0.1	0.1	-9.1	0.5
18	Han Dataport	0.1	0.1	0.1	41.3	0.5
19	GDS	0.1	0.2	0.1	-60.5	0.4
20	Dassault*	0.1	0	0.1	34.9	0.3
21	Altium*	0.1	0.1	0.1	-30.8	0.3
22	Formtek	-	-	0	NA	0.2
23	ASHLAR	-	0	0	451.7	0.1
24	EA Systems	-	0	0	-10.0	0.1
25	PAFEC	0	0	0	-	0
26	Lamp Software	0.1	0.2	-	-100.0	-
27	BATISOFT	0	0.1	-	-100.0	-
28	MEDesign	0	0	-	-100.0	-
	Other Companies	0.9	1.1	1.2	6.5	5.8
	All N.A. Companies	9.7	9.3	10.6	13.6	51.8
	All European Companies	5.2	6.7	8.7	29.7	42.4
	All Asian Companies	-	-	-	NA	-
	All Companies	15.8	17.2	20.5	19.4	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-4
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Benelux Software Companies, GIS/Mapping, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	ESRI	2.6	4.6	3.9	-16.3	19.9
2	Intergraph	3.8	2.7	3.0	9.4	15.4
3	Star Informatic	1.6	2.1	2.4	12.6	12.4
4	Siemens Nixdorf Info systeme	2.4	2.1	2.2	3.1	11.3
5	Autodesk	1.0	1.2	1.3	15.0	6.8
6	Smallworld Systems	0.3	1.2	1.2	0.8	6.4
7	Genasys II	1.0	1.1	1.1	4.9	5.7
8	IBM	0.4	0.4	0.4	-2.6	2.0
9	Enghouse Systems Ltd.	0.2	0.4	0.4	1.1	1.9
10	APIC Systemes	0.2	0.2	0.2	13.3	1.2
11	UNISYS	0.2	0.2	0.2	21.7	1.1
12	GDS	0.2	0.2	0.2	-4.8	0.9
13	Strategic Mapping	-	0.1	0.1	18.8	0.6
14	Geometria GIS Systems House	0.1	0.1	0.1	16.3	0.3
15	Sysdeco Innovation	0.1	0.1	0.1	-	0.3
16	Ziegler Informatics	0	0	0	20.0	0.2
17	RIB/Bausoftware	0	0	0	58.0	0.2
18	PAFEC	0	0	0	-	0.2
19	Straessle Informationssysteme	0.3	0.6	-	-100.0	-
20	Computervision	0	0.1	-	-100.0	-
21	Formtek	0	0	-	-100.0	-
	Other Companies	2.2	2.8	2.5	-9.4	13.0
	All N.A. Companies	9.3	10.9	10.6	-2.8	54.5
	All European Companies	4.9	6.5	6.3	-2.9	32.5
	All Asian Companies	-	-	-	NA	-
	All Companies	16.4	20.2	19.4	-3.8	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-5
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Benelux Software Companies, Electronic Design Automation, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Viewlogic Systems	0.8	1.0	1.6	56.9	11.1
2	Synopsys	0.7	1.3	1.4	7.5	9.9
3	Mentor Graphics	0.6	0.3	1.0	195.5	7.2
4	ULTImate Technology	0.8	0.7	0.9	26.3	6.3
5	Cadence	1.2	0.8	0.8	6.9	5.7
6	Sagantec	0.7	0.8	0.7	-3.9	5.1
7	Zuken-Redac	1.0	0.5	0.7	39.9	4.8
8	Hewlett-Packard	0.6	0.6	0.7	7.9	4.8
9	Zycad	0.1	0.3	0.6	93.7	4.5
10	Autodesk	0.6	0.6	0.6	-1.2	4.4
11	Wiechers Datentechnik	0	0.6	0.6	4.6	4.3
12	COMPASS Design Automation	0.5	0.5	0.5	-3.0	3.6
13	Intergraph	0.9	0.6	0.5	-17.5	3.2
14	Norlinvest Ltd.	0.7	0.6	0.4	-25.9	3.0
15	CAD-UL	0.2	0.2	0.2	-11.0	1.4
16	Harris EDA	0.2	0.1	0.2	21.4	1.2
17	IBM	0.1	0.1	0.1	38.1	0.9
18	Altium*	0.1	0.1	0.1	38.1	0.9
19	MacNeal-Schwendler	0	0	0.1	168.4	0.7
20	Optem Engineering	-	-	0.1	NA	0.4
21	ISDATA	0.1	0.1	0	-5.2	0.3
22	ALS Design	0.1	0.1	0	-41.5	0.3
23	Computervision	0.1	0.1	0	-63.0	0.3
24	Technische Computer Systeme	0	0	0	33.3	0.3
25	Siemens Nixdorf Info systeme	0.1	0	0	-22.6	0.3
26	Intusoft	-	-	0	NA	0.1
27	Kloeckner-Moeller	0	0	0	-	0.1
28	Ziegler Informatics	0.1	0.1	0	-91.2	0.1
29	ISD Software	-	0	0	27.6	0.1
30	Aucos elektronische Gerate	0.2	0.2	-	-100.0	-
	Other Companies	1.4	1.7	2.2	29.1	15.6
	All N.A. Companies	6.5	6.5	8.2	26.0	58.0
	All European Companies	2.9	3.4	3.0	-9.7	21.5
	All Asian Companies	1.0	0.5	0.7	39.9	4.8
	All Companies	11.9	12.1	14.1	17.0	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table B-1
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Benelux Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	ALS Design	0.1	0.1	0	-41.5	0
2	Altium*	0.7	0.5	0.4	-23.6	0.4
3	Ansys	0.1	0.5	0.5	9.1	0.6
4	APIC Systemes	0.2	0.2	0.2	13.3	0.2
5	Applicon	0.5	0.3	0.3	-12.2	0.3
6	ASCAD	0.4	0.4	0.6	32.5	0.6
7	ASHLAR	0	0	0.1	190.3	0.1
8	Aucos elektronische Gerate	0.2	0.2	-	-100.0	-
9	Autodesk	9.3	10.5	12.0	14.0	12.7
10	BATISOFT	0	0.1	-	-100.0	-
11	CAD-UL	0.2	0.2	0.2	-11.0	0.2
12	Cadence	1.2	0.8	0.8	6.9	0.9
13	CAMAX Manufacturing	-	0.1	0.2	190.6	0.3
14	CAMTEK	0.1	0.1	-	-100.0	-
15	CATALPA groupe Missler	0.1	0.1	0	-45.7	0
16	Cimatron	0.1	0.3	0.4	56.6	0.4
17	CIMLINC	0.2	0.2	0.2	17.3	0.2
18	COMPASS Design Automation	0.5	0.5	0.5	-3.0	0.5
19	Computervision	4.4	0.9	0.6	-29.5	0.7
20	Dassault*	0.9	2.2	3.1	40.0	3.3
21	Delcam International	0.3	0.1	0.1	-22.5	0.1
22	EA Systems	-	0	0	-10.0	0
23	EDS Unigraphics	5.0	5.7	8.8	56.2	9.4
24	Enghouse Systems Ltd.	0.2	0.4	0.4	1.1	0.4
25	ESRI	2.6	4.6	3.9	-16.3	4.1
26	Exapt	0.2	0.1	0.1	-16.7	0.1
27	Formtek	0.3	0.5	0.9	81.4	0.9
28	Framasoft	0.1	0	0	9.5	0
29	GDS	0.3	0.4	0.3	-32.6	0.3
30	Genasys II	1.0	1.1	1.1	4.9	1.2
31	Geometria GIS Systems House	0.1	0.1	0.1	16.3	0.1
32	Gerber Systems	0.3	0.3	0.1	-45.9	0.2
33	GRAFTEK	0	0	0	7.1	0
34	Graphisoft Group	0.2	0.1	0.3	167.8	0.3
35	Han Dataport	0.4	0.3	0.4	29.5	0.4
36	Harris EDA	0.2	0.1	0.2	21.4	0.2
37	Hewlett-Packard	3.1	0.6	0.7	7.9	0.7

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Benelux Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
38	Hochtief	0.7	0.8	1.5	83.9	1.6
39	IBM	5.6	5.9	7.2	21.4	7.6
40	ICEM Technologies	0.3	0.1	0.1	-61.9	0.1
41	IEZ	1.3	2.1	2.5	18.6	2.6
42	Intergraph	10.9	8.5	9.0	4.8	9.5
43	Intusoft	-	-	0	NA	0
44	Investronica SA	0.4	0.4	0.5	11.9	0.5
45	ISD Software	0.6	0.5	0.5	8.4	0.6
46	ISDATA	0.1	0.1	0	-5.2	0.1
47	Kloeckner-Moeller	0	0	0	-	0
48	Kockums Computer Systems	0.4	0.1	0.1	-9.1	0.1
49	Lamp Software	0.1	0.2	-	-100.0	-
50	MacNeal-Schwendler	1.2	2.4	1.6	-31.8	1.7
51	Matra Datavision	1.1	1.0	0.8	-25.7	0.8
52	MCS	0	0	0.2	379.1	0.2
53	MEDesign	0	0	-	-100.0	-
54	Mentor Graphics	0.6	0.3	1.0	195.5	1.1
55	MOSS Systems Group	0	0.4	0.5	18.1	0.6
56	Nemetschek	-	-	0.6	NA	0.6
57	Norlinvest Ltd.	0.7	0.6	0.4	-25.9	0.5
58	Optem Engineering	-	-	0.1	NA	0.1
59	PAFEC	0.2	0.1	0.1	-	0.1
60	Parametric Technology	1.8	4.2	7.2	72.4	7.7
61	Radan Computational	0.2	0.2	0.2	-	0.2
62	Rebis	-	-	0.3	NA	0.3
63	RIB/Bausoftware	0.1	0.1	0.2	69.4	0.2
64	RoboCAD Solutions	0.6	0.6	1.0	52.3	1.0
65	Sagantec	0.7	0.8	0.7	-3.9	0.8
66	SDRC	0.8	0.7	0.9	16.0	0.9
67	Sener Inginiera y Sistemaus	1.0	1.1	1.0	-10.1	1.0
68	Siemens Nixdorf Info systeme	3.0	2.7	2.7	1.0	2.9
69	Silicon Valley Research	0.3	0.1	-	-100.0	-
70	Smallworld Systems	0.3	1.2	1.2	0.8	1.3
71	Star Informatic	2.4	3.2	3.5	9.1	3.7
72	Straessle Informationssysteme	0.3	0.6	-	-100.0	-
73	Strategic Mapping	-	0.1	0.1	18.8	0.1
74	Synopsys	0.7	1.3	1.4	7.5	1.5

(Continued)

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Benelux Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
75	Sysdeco Innovation	0.1	0.1	0.1	-	0.1
76	Technische Computer Systeme	0.2	0.3	0.4	31.3	0.4
77	ULTImate Technology	0.8	0.7	0.9	26.3	1.0
78	UNISYS	0.2	0.2	0.2	21.7	0.2
79	Vero International Software	0	0	0	45.3	0
80	Viewlogic Systems	0.8	1.0	1.6	56.9	1.7
81	Wiechers Datentechnik	0.2	0.8	0.9	7.3	0.9
82	Ziegler Informatics	0.3	0.3	0.3	-3.7	0.3
83	Zuken-Redac	1.0	0.5	0.7	39.9	0.7
84	Zycad	0.1	0.3	0.6	93.7	0.7
	Other Companies	5.3	6.1	7.4	21.3	7.9
	All N.A. Companies	51.9	52.6	63.0	19.8	66.9
	All European Companies	18.5	21.5	23.1	7.3	24.5
	All Asian Companies	1.0	0.5	0.7	39.9	0.7
	All Companies	76.7	80.8	94.2	16.7	100.0

NA = Not applicable
*Company statistics contain VAR/distributor revenue not counted in total
Source: Dataquest (August 1995)

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Table A-6
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Scandinavia Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Intergraph	17.2	13.7	14.4	5.3	12.8
2	IBM	11.2	11.3	14.2	26.0	12.6
3	Autodesk	10.6	11.8	13.5	14.0	12.0
4	Mentor Graphics	3.5	5.8	8.0	36.2	7.1
5	Parametric Technology	1.6	3.6	6.1	72.4	5.5
6	ESRI	2.7	4.9	5.8	19.8	5.2
7	Dassault*	1.7	1.5	4.7	215.0	4.2
8	Computervision	9.0	3.9	4.2	6.0	3.7
9	Cadence	4.4	2.8	3.0	6.9	2.7
10	MacNeal-Schwendler	2.6	2.9	2.8	-3.3	2.5
11	SDRC	2.1	2.0	2.3	17.1	2.1
12	Viewlogic Systems	1.5	1.7	1.9	12.1	1.7
13	Synopsys	0.9	1.7	1.8	7.5	1.6
14	Siemens Nixdorf Info systeme	1.8	1.6	1.7	3.1	1.5
15	Sysdeco Innovation	1.2	1.2	1.6	42.6	1.5
16	Harris EDA	0.9	1.5	1.6	3.9	1.4
17	Genasys II	1.0	1.3	1.3	4.9	1.2
18	Sener Inginiera y Sistemaus	1.4	1.4	1.2	-16.7	1.1
19	Wiechers Datentechnik	0	0.6	1.1	97.8	1.0
20	Ansys	0.9	0.9	1.0	9.1	0.9
21	Formtek	0.3	0.5	0.9	81.4	0.8
22	CAD Centre	0.9	0.6	0.8	37.3	0.7
23	Ziegler Informatics	0.7	0.9	0.8	-18.3	0.7
24	Straessle Informationssysteme	0.1	0.3	0.7	131.6	0.7
25	Hewlett-Packard	3.1	0.6	0.7	7.9	0.6
26	Zuken-Redac	0.7	1.5	0.7	-52.7	0.6
27	Norlinvest Ltd.	0.3	0.5	0.7	45.7	0.6
28	Enghouse Systems Ltd.	0.6	0.7	0.7	1.1	0.6
29	Altium*	1.2	0.8	0.6	-24.3	0.6
30	Tebis	0.9	0.9	0.6	-30.4	0.5
	Other Companies	7.9	8.6	10.2	18.6	9.1
	All N.A. Companies	77.5	74.3	87.5	17.8	77.9
	All European Companies	14.1	12.4	14.0	12.6	12.4
	All Asian Companies	0.7	1.5	0.7	-52.7	0.6
	All Companies	100.2	96.7	112.3	16.1	100.0

*Company statistics contain VAR/distributor revenue not counted in total
Source: Dataquest (August 1995)

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Table A-7
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Scandinavia Software Companies, Mechanical, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	IBM	9.9	9.8	12.6	28.1	28.6
2	Parametric Technology	1.6	3.6	6.1	72.4	14.0
3	Autodesk	4.2	4.7	5.4	14.3	12.3
4	Dassault*	1.6	1.5	4.6	215.2	10.5
5	Computervision	7.6	3.1	3.2	1.9	7.3
6	MacNeal-Schwendler	2.5	2.9	2.6	-8.9	5.9
7	Intergraph	3.3	2.6	2.6	-0.9	5.8
8	SDRC	2.1	2.0	2.3	17.1	5.3
9	Ansys	0.9	0.9	1.0	9.1	2.2
10	Formtek	0.3	0.5	0.8	80.3	1.9
11	Tebis	0.9	0.9	0.6	-30.4	1.4
12	Investronica SA	0.3	0.3	0.6	140.0	1.4
13	CIMLINC	0.4	0.5	0.6	17.3	1.3
14	Altium*	0.9	0.6	0.4	-21.9	1.0
15	Cimatron	-	0.2	0.4	88.2	0.9
16	PAFEC	0.4	0.3	0.3	-	0.7
17	Applicon	1.0	0.3	0.3	-12.2	0.6
18	ISD Software	0.2	0.2	0.3	8.2	0.6
19	Delcam International	0.3	0.2	0.2	37.8	0.5
20	Ziegler Informatics	0.3	0.3	0.2	-31.8	0.5
21	Whessoe Computing Systems	0.2	0.2	0.2	-	0.5
22	Exapt	0.3	0.3	0.2	-34.6	0.4
23	Anilam Electronics	0.1	0.1	0.2	23.1	0.4
24	Superdraft	0.1	0.1	0.2	41.9	0.4
25	Mechanical Dynamics	-	0.1	0.1	20.0	0.3
26	CNC Software	0.1	0.1	0.1	27.1	0.3
27	Computational Mechanics	-	0.1	0.1	-1.1	0.3
28	CAMAX Manufacturing	-	0	0.1	190.6	0.3
29	Wiechers Datentechnik	-	0.1	0.1	46.1	0.3
30	Pathtrace Engineering Systems	0.1	0.1	0.1	66.7	0.2
	Other Companies	1.8	1.4	1.9	29.4	4.2
	All N.A. Companies	36.8	31.2	38.1	22.0	86.7
	All European Companies	5.1	4.4	4.0	-9.5	9.1
	All Asian Companies	-	-	-	NA	-
	All Companies	43.8	37.1	43.9	18.5	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-8
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Scandinavia Software Companies, AEC, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Autodesk	4.6	5.1	5.9	15.6	31.1
2	Intergraph	6.2	5.4	5.8	6.6	30.6
3	IBM	0.9	1.1	1.3	18.0	6.7
4	Sener Ingiriera y Sistemaus	1.4	1.4	1.2	-16.7	6.3
5	Computervision	1.1	0.7	1.0	41.9	5.3
6	CAD Centre	0.5	0.5	0.7	37.3	3.9
7	Ziegler Informatics	0.1	0.2	0.4	177.7	2.2
8	Graphisoft Group	0.1	0.2	0.4	100.8	2.0
9	Rebis	-	-	0.3	NA	1.4
10	Kockums Computer Systems	1.8	0.2	0.2	-18.2	1.0
11	Dassault*	0.1	0	0.1	203.6	0.5
12	RoboCAD Solutions	0.2	0.2	0.1	-51.1	0.4
13	Altium*	0.1	0.1	0.1	-51.8	0.3
14	Formtek	-	-	0	NA	0.3
15	EA Systems	-	0	0	-10.0	0.1
16	ASHLAR	-	0	0	451.7	0.1
17	GDS	0.2	0.3	0	-96.0	0.1
18	PAFEC	0	0	0	-	0.1
19	MEDesign	0.3	0.2	-	-100.0	-
	Other Companies	1.2	1.5	1.6	6.6	8.4
	All N.A. Companies	12.9	12.6	14.3	13.8	75.7
	All European Companies	4.7	2.9	3.0	2.6	15.9
	All Asian Companies	-	-	-	NA	-
	All Companies	18.8	17.0	18.9	11.2	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-9
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Scandinavia Software Companies, GIS/Mapping, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	ESRI	2.7	4.9	5.8	19.8	23.5
2	Intergraph	6.9	5.1	5.6	9.4	22.7
3	Siemens Nixdorf Info systeme	1.8	1.6	1.7	3.1	6.7
4	Sysdeco Innovation	1.2	1.2	1.6	42.6	6.6
5	Autodesk	1.2	1.3	1.5	15.0	6.1
6	Genasys II	1.0	1.3	1.3	4.9	5.4
7	Straessle Informationssysteme	0.1	0.3	0.7	131.6	3.0
8	Enghouse Systems Ltd.	0.6	0.7	0.7	1.1	2.7
9	Smallworld Systems	-	-	0.5	NA	2.0
10	UNISYS	0.2	0.2	0.4	58.7	1.5
11	MapInfo	0.3	0.1	0.3	174.8	1.2
12	IBM	0.2	0.2	0.2	-2.6	1.0
13	Laser-Scan	0.1	0.1	0.2	60.0	0.8
14	APIC Systemes	0.2	0.2	0.2	-22.7	0.6
15	PAFEC	0.1	0.1	0.1	44.4	0.5
16	Ziegler Informatics	0.1	0.1	0.1	-32.1	0.3
17	GDS	0.1	0.1	0	-69.9	0.1
18	Computervision	0.1	0.1	-	-100.0	-
19	Formtek	0	0	-	-100.0	-
	Other Companies	3.2	3.6	3.8	5.4	15.3
	All N.A. Companies	13.3	14.0	15.8	13.1	64.1
	All European Companies	3.5	3.6	5.1	41.5	20.6
	All Asian Companies	-	-	-	NA	-
	All Companies	20.0	21.2	24.7	16.6	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-10
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Scandinavia Software Companies, Electronic Design Automation, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Mentor Graphics	3.5	5.8	8.0	36.2	29.8
2	Cadence	4.4	2.8	3.0	6.9	11.3
3	Viewlogic Systems	1.5	1.7	1.9	12.1	7.1
4	Synopsys	0.9	1.7	1.8	7.5	6.7
5	Harris EDA	0.9	1.5	1.6	3.9	5.9
6	Wiechers Datentechnik	0	0.5	1.0	106.6	3.6
7	Autodesk	0.6	0.7	0.7	-1.2	2.6
8	Hewlett-Packard	0.6	0.6	0.7	7.9	2.6
9	Zuken-Redac	0.7	1.5	0.7	-52.7	2.6
10	Norlinvest Ltd.	0.3	0.5	0.7	45.7	2.5
11	Intergraph	0.9	0.6	0.5	-17.5	1.7
12	Zycad	0.1	0.3	0.3	-3.1	1.2
13	PADS Software	-	0.3	0.3	-9.1	1.1
14	MacNeal-Schwendler	0.1	0	0.2	342.0	0.8
15	IBM	0.2	0.2	0.1	-9.9	0.5
16	Altium*	0.2	0.2	0.1	-9.9	0.5
17	Summitt Design	0.1	0.1	0.1	3.6	0.4
18	ISDATA	0.1	0.1	0.1	5.3	0.4
19	ULTImate Technology	0.1	0.1	0.1	-6.6	0.3
20	Ziegler Informatics	0.3	0.3	0	-87.3	0.2
21	Design Acceleration	-	-	0	NA	0.1
22	Intusoft	-	-	0	NA	0
	Other Companies	2.8	4.0	4.9	22.5	18.5
	All N.A. Companies	14.4	16.4	19.2	17.0	71.9
	All European Companies	0.8	1.5	1.9	28.2	7.0
	All Asian Companies	0.7	1.5	0.7	-52.7	2.6
	All Companies	18.7	23.4	26.7	14.3	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table B-2
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Scandinavia Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Altium*	1.2	0.8	0.6	-24.3	0.6
2	Anilam Electronics	0.1	0.1	0.2	23.1	0.1
3	Ansys	0.9	0.9	1.0	9.1	0.9
4	APIC Systemes	0.2	0.2	0.2	-22.7	0.1
5	Applicon	1.0	0.3	0.3	-12.2	0.3
6	ASHLAR	0	0	0.1	190.3	0.1
7	Autodesk	10.6	11.8	13.5	14.0	12.0
8	B.A.Intelligence Networks	0	0	0.1	56.7	0.1
9	CAD Centre	0.9	0.6	0.8	37.3	0.7
10	Cadence	4.4	2.8	3.0	6.9	2.7
11	CAMAX Manufacturing	-	0	0.1	190.6	0.1
12	CAMTEK	0	0	-	-100.0	-
13	Cimatron	-	0.2	0.4	88.2	0.4
14	CIMLINC	0.4	0.5	0.6	17.3	0.5
15	CNC Software	0.1	0.1	0.1	27.1	0.1
16	Computational Mechanics	-	0.1	0.1	-1.1	0.1
17	Computervision	9.0	3.9	4.2	6.0	3.7
18	Dassault*	1.7	1.5	4.7	215.0	4.2
19	Delcam International	0.3	0.2	0.2	37.8	0.2
20	Design Acceleration	-	-	0	NA	0
21	EA Systems	-	0	0	-10.0	0
22	Enghouse Systems Ltd.	0.6	0.7	0.7	1.1	0.6
23	ESRI	2.7	4.9	5.8	19.8	5.2
24	Exapt	0.3	0.3	0.2	-34.6	0.2
25	FEGS	0.1	0.1	-	-100.0	-
26	Formtek	0.3	0.5	0.9	81.4	0.8
27	Framasoft	0.3	0.1	0	-60.3	0
28	GDS	0.4	0.3	0	-89.7	0
29	Genasys II	1.0	1.3	1.3	4.9	1.2
30	GRAFTEK	0	0	0	7.1	0
31	Graphisoft Group	0.2	0.2	0.4	100.8	0.3
32	Harris EDA	0.9	1.5	1.6	3.9	1.4
33	Hewlett-Packard	3.1	0.6	0.7	7.9	0.6
34	IBM	11.2	11.3	14.2	26.0	12.6
35	ICEM Technologies	0.5	0.2	0.1	-76.2	0
36	Intergraph	17.2	13.7	14.4	5.3	12.8
37	Intusoft	-	-	0	NA	0

(Continued)

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Table B-2 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Scandinavia Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
38	Investronica SA	0.3	0.3	0.6	140.0	0.5
39	ISD Software	0.2	0.2	0.3	8.2	0.2
40	ISDATA	0.1	0.1	0.1	5.3	0.1
41	Kockums Computer Systems	1.8	0.2	0.2	-18.2	0.2
42	Laser-Scan	0.1	0.1	0.2	60.0	0.2
43	Livermore Software Tech.	0	0.1	0.1	48.6	0.1
44	MacNeal-Schwendler	2.6	2.9	2.8	-3.3	2.5
45	MapInfo	0.3	0.1	0.3	174.8	0.3
46	Matra Datavision	0.4	0.3	-	-100.0	-
47	Mechanical Dynamics	-	0.1	0.1	20.0	0.1
48	MEDesign	0.3	0.2	-	-100.0	-
49	Mentor Graphics	3.5	5.8	8.0	36.2	7.1
50	Norlinvest Ltd.	0.3	0.5	0.7	45.7	0.6
51	PADS Software	-	0.3	0.3	-9.1	0.3
52	PAFEC	0.5	0.4	0.4	10.0	0.4
53	Parametric Technology	1.6	3.6	6.1	72.4	5.5
54	Pathtrace Engineering Systems	0.1	0.1	0.1	66.7	0.1
55	Radan Computational	0.1	0.1	0.1	-	0.1
56	Rebis	-	-	0.3	NA	0.2
57	RoboCAD Solutions	0.3	0.3	0.2	-51.1	0.1
58	SDRC	2.1	2.0	2.3	17.1	2.1
59	Sener Inginiera y Sistemaus	1.4	1.4	1.2	-16.7	1.1
60	Siemens Nixdorf Info systeme	1.8	1.6	1.7	3.1	1.5
61	Smallworld Systems	-	-	0.5	NA	0.4
62	Straessle Informationssysteme	0.1	0.3	0.7	131.6	0.7
63	Summitt Design	0.1	0.1	0.1	3.6	0.1
64	Superdraft	0.1	0.1	0.2	41.9	0.1
65	Synopsys	0.9	1.7	1.8	7.5	1.6
66	Sysdeco Innovation	1.2	1.2	1.6	42.6	1.5
67	Tebis	0.9	0.9	0.6	-30.4	0.5
68	ULTImate Technology	0.1	0.1	0.1	-6.6	0.1
69	UNISYS	0.2	0.2	0.4	58.7	0.3
70	Viewlogic Systems	1.5	1.7	1.9	12.1	1.7
71	Whessoe Computing Systems	0.2	0.2	0.2	-	0.2
72	Wiechers Datentechnik	0	0.6	1.1	97.8	1.0
73	Ziegler Informatics	0.7	0.9	0.8	-18.3	0.7
74	Zuken-Redac	0.7	1.5	0.7	-52.7	0.6

(Continued)

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Table B-2 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Scandinavia Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
75	Zycad	0.1	0.3	0.3	-3.1	0.3
	Other Companies	7.9	8.6	10.2	18.6	9.1
	All N.A. Companies	77.5	74.3	87.5	17.8	77.9
	All European Companies	14.1	12.4	14.0	12.6	12.4
	All Asian Companies	0.7	1.5	0.7	-52.7	0.6
	All Companies	100.2	96.7	112.3	16.1	100.0

NA = Not applicable
*Company statistics contain VAR/distributor revenue not counted in total
Source: Dataquest (August 1995)

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Table A-11
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Spain Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Intergraph	6.7	5.9	6.2	5.0	12.3
2	Autodesk	5.3	5.3	6.0	14.0	12.0
3	ABB Industria*	6.6	6.6	5.6	-14.3	11.3
4	CIMTEK*	4.3	3.5	4.1	17.2	8.2
5	IBM	3.2	3.2	4.0	25.4	8.0
6	FHECOR*	3.9	3.6	3.7	4.2	7.5
7	Dassault*	0.9	0.7	3.1	319.9	6.3
8	Softronics	3.0	3.4	3.0	-9.9	6.0
9	ESRI	2.0	2.4	2.9	20.5	5.8
10	Siemens Nixdorf Info systeme	3.0	2.7	2.8	3.1	5.5
11	Computervision	4.4	4.1	2.7	-34.6	5.4
12	Parametric Technology	0.5	1.3	2.2	72.4	4.5
13	EDS Unigraphics	1.0	1.1	1.7	50.2	3.4
14	MacNeal-Schwendler	1.1	1.4	1.2	-13.1	2.4
15	ARKTEC	0.9	1.0	1.1	17.5	2.2
16	Genasys II	1.0	1.1	1.1	4.9	2.2
17	SDRC	0.8	0.7	0.9	16.0	1.7
18	Cadence	1.2	0.8	0.8	6.9	1.6
19	Tebis	1.6	0.6	0.7	18.8	1.4
20	Hewlett-Packard	3.4	0.5	0.5	7.9	1.1
21	COMPASS Design Automation	0.3	0.5	0.5	-3.0	1.0
22	UNISYS	0.4	0.5	0.5	4.3	1.0
23	Mentor Graphics	0.1	0.5	0.5	-1.5	1.0
24	DAPCO	1.2	0.4	0.5	26.2	0.9
25	Investronica SA	1.0	1.0	0.4	-57.0	0.9
26	Ziegler Informatics	0.9	0.7	0.4	-40.6	0.8
27	IEZ	0.5	0.3	0.4	34.2	0.8
28	Synopsys	0.2	0.4	0.4	7.5	0.8
29	Ansys	0.5	0.3	0.4	9.1	0.8
30	Delcam International	0.2	0.3	0.3	32.9	0.7
	Other Companies	3.4	3.5	3.9	11.5	7.9
	All N.A. Companies	33.0	30.5	33.3	9.2	66.6
	All European Companies	17.3	13.0	12.8	-1.8	25.5
	All Asian Companies	-	-	-	NA	-
	All Companies	53.7	47.0	50.0	6.3	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-12
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Spain Software Companies, Mechanical, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	CIMTEK*	4.3	3.5	4.1	17.2	19.3
2	IBM	2.7	2.8	3.5	27.2	16.6
3	Dassault*	0.8	0.7	3.1	320.2	14.6
4	Computervision	3.7	3.7	2.5	-33.2	11.8
5	Autodesk	2.1	2.1	2.4	14.3	11.4
6	Parametric Technology	0.5	1.3	2.2	72.4	10.5
7	EDS Unigraphics	1.0	1.1	1.7	50.2	8.0
8	ABB Industria*	2.3	2.4	1.3	-45.3	6.3
9	Intergraph	1.5	1.2	1.2	-0.9	5.6
10	MacNeal-Schwendler	1.1	1.3	1.1	-18.2	5.2
11	Softronics	1.7	1.3	0.9	-26.6	4.4
12	SDRC	0.8	0.7	0.9	16.0	4.1
13	Tebis	1.6	0.6	0.7	18.8	3.3
14	FHECOR*	0.7	0.6	0.5	-16.4	2.4
15	Investronica SA	1.0	1.0	0.4	-57.0	2.0
16	Ansys	0.5	0.3	0.4	9.1	1.8
17	Delcam International	0.2	0.3	0.3	32.9	1.6
18	ICEM Technologies	0.6	0.3	0.3	12.6	1.6
19	Cimatron	0.4	0.3	0.3	-10.6	1.3
20	ISD Software	0.3	0.2	0.3	8.2	1.3
21	Straessle Informationssysteme	0.4	0.1	0.2	43.4	0.9
22	ADRA Systems	-	0.1	0.2	11.5	0.8
23	Applicon	0.2	0.2	0.1	-12.2	0.7
24	Altium*	0.3	0.2	0.1	-28.2	0.6
25	Han Dataport	0.1	0.1	0.1	15.4	0.5
26	PAFEC	0.1	0.1	0.1	-	0.5
27	Ziegler Informatics	0.3	0.2	0.1	-54.6	0.5
28	Gerber Systems	-	-	0.1	NA	0.4
29	CAD Lab	0.2	0.1	0.1	7.7	0.3
30	RoboCAD Solutions	0.1	0.1	0.1	-31.9	0.3
	Other Companies	0.8	0.7	0.8	14.9	3.8
	All N.A. Companies	17.2	15.0	16.4	8.8	77.2
	All European Companies	7.7	5.1	4.0	-21.6	18.9
	All Asian Companies	-	-	-	NA	-
	All Companies	25.7	20.8	21.2	1.5	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-13
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Spain Software Companies, AEC, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	FHECOR*	3.2	3.0	3.2	8.4	33.8
2	ABB Industria*	0.4	2.4	2.7	11.5	28.4
3	Autodesk	2.3	2.3	2.6	15.6	27.4
4	Intergraph	1.8	1.6	1.7	6.6	17.5
5	Softronics	0.8	1.4	1.4	-	14.7
6	ARKTEC	0.9	1.0	1.1	17.5	11.7
7	IEZ	0.5	0.3	0.4	34.2	4.2
8	IBM	0.4	0.3	0.4	21.6	3.9
9	Kockums Computer Systems	0.3	0.2	0.3	70.6	3.0
10	Ziegler Informatics	0.1	0.1	0.2	73.6	2.2
11	Computervision	0.5	0.3	0.2	-33.8	2.1
12	Han Dataport	0.1	0.1	0.1	23.7	1.3
13	Graphisoft Group	0.1	0	0.1	145.5	1.2
14	DAPCO	0.2	0.1	0.1	49.3	1.1
15	MOSS Systems Group	-	0.1	0.1	18.1	0.9
16	Star Informatic	1.1	0.1	0.1	60.0	0.8
17	RoboCAD Solutions	0.1	0.1	0.1	-31.9	0.7
18	Dassault*	0.1	0	0.1	304.8	0.6
19	Ground Modelling Systems	0	0	0.1	25.0	0.5
20	Rebis	-	-	0	NA	0.5
21	GDS	0.1	0.2	0	-77.6	0.4
22	Altium*	0	0	0	-17.8	0.3
23	PAFEC	0	0	0	-	0.1
24	Soft*	1.3	1.1	-	-100.0	-
25	DELTA CAD*	0	0.3	-	-100.0	-
26	Aplein*	0.1	0.1	-	-100.0	-
27	BATISOFT	0.1	0	-	-100.0	-
	Other Companies	0.5	0.6	0.6	0.1	5.8
	All N.A. Companies	5.1	4.6	4.9	6.9	51.8
	All European Companies	4.6	3.5	4.1	17.0	42.5
	All Asian Companies	-	-	-	NA	-
	All Companies	10.1	8.6	9.5	10.5	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-14
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Spain Software Companies, GIS/Mapping, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Intergraph	2.8	2.8	3.0	9.4	20.8
2	ESRI	2.0	2.4	2.9	20.5	20.0
3	Siemens Nixdorf Info systeme	3.0	2.7	2.8	3.1	19.0
4	Genasys II	1.0	1.1	1.1	4.9	7.6
5	ABB Industria*	1.0	0.9	0.8	-17.4	5.2
6	Autodesk	0.6	0.6	0.7	15.0	4.6
7	UNISYS	0.4	0.5	0.5	4.3	3.5
8	Softronics	0.3	0.4	0.5	7.0	3.2
9	DAPCO	0.7	0.3	0.3	20.7	2.4
10	APIC Systemes	0.2	0.2	0.3	28.8	1.8
11	Laser-Scan	-	-	0.2	NA	1.3
12	GDS	0.1	-	0.1	NA	0.7
13	Ziegler Informatics	0.1	0.1	0.1	-26.2	0.7
14	IBM	0.1	0.1	0.1	-2.6	0.4
15	Ground Modelling Systems	0.1	0	0	-25.0	0.2
16	PAFEC	0	0	0	-	0.1
17	Computervision	0	0.1	-	-100.0	-
	Other Companies	1.7	1.9	2.0	5.0	13.8
	All N.A. Companies	7.0	7.4	8.4	12.6	57.6
	All European Companies	4.4	3.8	4.2	10.0	28.6
	All Asian Companies	-	-	-	NA	-
	All Companies	13.1	13.1	14.5	10.7	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-15
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Spain Software Companies, Electronic Design Automation, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	ABB Industria*	3.0	0.8	0.8	5.1	16.1
2	Cadence	1.2	0.8	0.8	6.9	15.7
3	Hewlett-Packard	0.5	0.5	0.5	7.9	10.3
4	COMPASS Design Automation	0.3	0.5	0.5	-3.0	10.0
5	Mentor Graphics	0.1	0.5	0.5	-1.5	9.9
6	Synopsys	0.2	0.4	0.4	7.5	7.8
7	Autodesk	0.3	0.3	0.3	-1.2	6.1
8	Intergraph	0.6	0.3	0.3	-17.5	5.6
9	Wiechers Datentechnik	-	0.1	0.2	120.6	4.7
10	Softronics	0.2	0.2	0.2	-8.3	4.3
11	Viewlogic Systems	0.1	0	0.1	14,999.1	2.2
12	MacNeal-Schwendler	0	0	0.1	213.1	1.8
13	PADS Software	-	0	0	172.6	0.9
14	IBM	0.1	0	0	-23.2	0.7
15	Altium*	0.1	0	0	-23.2	0.7
16	Norlinvest Ltd.	0	0	0	-	0.6
17	ALS Design	0.1	0	0	17.0	0.5
18	Ziegler Informatics	0.3	0.2	0	-92.7	0.3
19	Kloeckner-Moeller	0	0	0	-	0.2
20	ULTImate Technology	0	-	0	NA	0.2
21	Intusoft	-	-	0	NA	0.1
	Other Companies	0.8	0.8	0.9	14.8	18.4
	All N.A. Companies	3.7	3.4	3.6	6.7	70.9
	All European Companies	0.7	0.7	0.6	-14.9	10.8
	All Asian Companies	-	-	-	NA	-
	All Companies	5.2	4.9	5.1	5.2	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table B-3
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Spain Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	ABB Industria*	6.6	6.6	5.6	-14.3	11.3
2	ADRA Systems	-	0.1	0.2	11.5	0.3
3	ALS Design	0.1	0	0	17.0	0
4	Altium*	0.4	0.2	0.2	-25.6	0.4
5	Anilam Electronics	0.1	0	0	-25.0	0.1
6	Ansys	0.5	0.3	0.4	9.1	0.8
7	APIC Systemes	0.2	0.2	0.3	28.8	0.5
8	Aplein*	0.1	0.1	-	-100.0	-
9	Applicon	0.2	0.2	0.1	-12.2	0.3
10	ARKTEC	0.9	1.0	1.1	17.5	2.2
11	Autodesk	5.3	5.3	6.0	14.0	12.0
12	BATISOFT	0.1	0	-	-100.0	-
13	CAD Lab	0.2	0.1	0.1	7.7	0.1
14	CAD TECH Iberica*	0.5	0.4	-	-100.0	-
15	Cadence	1.2	0.8	0.8	6.9	1.6
16	CAMAX Manufacturing	-	0	0.1	190.6	0.1
17	CAMTEK	0	0	-	-100.0	-
18	Cimatron	0.4	0.3	0.3	-10.6	0.5
19	CIMTEK*	4.3	3.5	4.1	17.2	8.2
20	COMPASS Design Automation	0.3	0.5	0.5	-3.0	1.0
21	Computervision	4.4	4.1	2.7	-34.6	5.4
22	DAPCO	1.2	0.4	0.5	26.2	0.9
23	Dassault*	0.9	0.7	3.1	319.9	6.3
24	Delcam International	0.2	0.3	0.3	32.9	0.7
25	DELTA CAD*	0.5	1.0	-	-100.0	-
26	EDS Unigraphics	1.0	1.1	1.7	50.2	3.4
27	ESRI	2.0	2.4	2.9	20.5	5.8
28	FHECOR*	3.9	3.6	3.7	4.2	7.5
29	GDS	0.1	0.2	0.1	-23.7	0.3
30	Genasys II	1.0	1.1	1.1	4.9	2.2
31	Gerber Systems	-	-	0.1	NA	0.2
32	GRAFTEK	0	0	0	7.1	0
33	Graphisoft Group	0.1	0	0.1	145.5	0.2
34	Ground Modelling Systems	0.1	0.1	0.1	-	0.2
35	Han Dataport	0.2	0.2	0.2	19.5	0.5
36	Hewlett-Packard	3.4	0.5	0.5	7.9	1.1

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Table B-3 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Spain Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
37	IBM	3.2	3.2	4.0	25.4	8.0
38	ICEM Technologies	0.6	0.3	0.3	12.6	0.7
39	IEZ	0.5	0.3	0.4	34.2	0.8
40	Intergraph	6.7	5.9	6.2	5.0	12.3
41	Intusoft	-	-	0	NA	0
42	Investronica SA	1.0	1.0	0.4	-57.0	0.9
43	ISD Software	0.3	0.2	0.3	8.2	0.5
44	Kloeckner-Moeller	0	0	0	-	0
45	Kockums Computer Systems	0.3	0.2	0.3	70.6	0.6
46	Laser-Scan	-	-	0.2	NA	0.4
47	Logic System Designers*	0.1	0.7	-	-100.0	-
48	MacNeal-Schwendler	1.1	1.4	1.2	-13.1	2.4
49	Matra Datavision	0.4	0.3	-	-100.0	-
50	MCS	0	0.1	0	-22.8	0.1
51	Mentor Graphics	0.1	0.5	0.5	-1.5	1.0
52	MOSS Systems Group	-	0.1	0.1	18.1	0.2
53	Norlinvest Ltd.	0	0	0	-	0.1
54	PADS Software	-	0	0	172.6	0.1
55	PAFEC	0.2	0.1	0.1	-	0.3
56	Parametric Technology	0.5	1.3	2.2	72.4	4.5
57	Pathtrace Engineering Systems	-	0	0	-	0
58	Rebis	-	-	0	NA	0.1
59	RoboCAD Solutions	0.2	0.2	0.1	-31.9	0.3
60	SDRC	0.8	0.7	0.9	16.0	1.7
61	Siemens Nixdorf Info systeme	3.0	2.7	2.8	3.1	5.5
62	Soft*	1.3	1.1	-	-100.0	-
63	Softronics	3.0	3.4	3.0	-9.9	6.0
64	Star Informatic	1.1	0.1	0.1	60.0	0.2
65	Straessle Informationssysteme	0.4	0.1	0.2	43.4	0.4
66	Synopsys	0.2	0.4	0.4	7.5	0.8
67	Tebis	1.6	0.6	0.7	18.8	1.4
68	ULTImate Technology	0	-	0	NA	0
69	UNISYS	0.4	0.5	0.5	4.3	1.0
70	Vero International Software	0	0	0	45.3	0.1
71	Viewlogic Systems	0.1	0	0.1	14,999.1	0.2
72	Wiechers Datentechnik	-	0.1	0.2	120.6	0.5

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Table B-3 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Spain Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
73	Ziegler Informatics	0.9	0.7	0.4	-40.6	0.8
	Other Companies	3.4	3.5	3.9	11.5	7.9
	All N.A. Companies	33.0	30.5	33.3	9.2	66.6
	All European Companies	17.3	13.0	12.8	-1.8	25.5
	All Asian Companies	-	-	-	NA	-
	All Companies	53.7	47.0	50.0	6.3	100.0

NA = Not applicable
*Company statistics contain VAR/distributor revenue not counted in total
Source: Dataquest (August 1995)

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Table A-16
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Russia Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	ESRI	-	-	1.9	NA	30.9
2	Siemens Nixdorf Info systeme	1.8	1.7	1.7	3.1	27.3
3	Dassault*	-	2.2	1.6	-30.0	25.1
4	Mentor Graphics	0.1	0.2	0.8	392.5	13.5
5	Matra Datavision	-	-	0.8	NA	12.0
6	Delcam International	-	0.4	0.6	47.1	9.1
7	Graphisoft Group	-	0	0.1	122.9	1.7
	Other Companies	0	0	0.3	978.1	5.4
	All N.A. Companies	0.1	0.2	2.8	1,519.4	44.4
	All European Companies	1.8	2.1	3.1	50.0	50.2
	All Asian Companies	-	-	-	NA	-
	All Companies	2.0	2.3	6.3	172.6	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-17
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Russia Software Companies, Mechanical, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Dassault*	-	2.2	1.5	-30.0	115.6
2	Matra Datavision	-	-	0.8	NA	56.6
3	Delcam International	-	0.4	0.6	47.1	42.6
4	Graphisoft Group	-	0	0	122.9	0.2
	Other Companies	-	0	0	313.3	0.6
	All N.A. Companies	-	-	-	NA	-
	All European Companies	-	0.4	1.3	241.9	99.4
	All Asian Companies	-	-	-	NA	-
	All Companies	-	0.4	1.3	242.3	100.0

NA = Not applicable
*Company statistics contain VAR/distributor revenue not counted in total
Source: Dataquest (August 1995)

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Table A-18
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Russia Software Companies, AEC, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Graphisoft Group	-	0	0.1	122.9	100.0
2	Dassault*	-	0	0	-32.5	27.2
	Other Companies	-	-	-	NA	-
	All N.A. Companies	-	-	-	NA	-
	All European Companies	-	0	0.1	122.9	100.0
	All Asian Companies	-	-	-	NA	-
	All Companies	-	0	0.1	122.9	100.0

NA = Not applicable
*Company statistics contain VAR/distributor revenue not counted in total
Source: Dataquest (August 1995)

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Table A-19
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Russia Software Companies, GIS/Mapping, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	ESRI	-	-	1.9	NA	47.1
2	Siemens Nixdorf Info systeme	1.8	1.7	1.7	3.1	41.6
	Other Companies	-	-	0.5	NA	11.3
	All N.A. Companies	-	-	1.9	NA	47.1
	All European Companies	1.8	1.7	1.7	3.1	41.6
	All Asian Companies	-	-	-	NA	-
	All Companies	1.8	1.7	4.1	147.7	100.0

NA = Not applicable
*Company statistics contain VAR/distributor revenue not counted in total
Source: Dataquest (August 1995)

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Table A-20
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Russia Software Companies, Electronic Design Automation, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Mentor Graphics	0.1	0.2	0.8	392.5	79.8
	Other Companies	0	0	0.2	434.6	20.2
	All N.A. Companies	0.1	0.2	0.8	392.5	79.8
	All European Companies	-	-	-	NA	-
	All Asian Companies	-	-	-	NA	-
	All Companies	0.2	0.2	1.1	400.5	100.0

NA = Not applicable
*Company statistics contain VAR/distributor revenue not counted in total
Source: Dataquest (August 1995)

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Table B-4
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Russia Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Dassault*	-	2.2	1.6	-30.0	25.1
2	Delcam International	-	0.4	0.6	47.1	9.1
3	ESRI	-	-	1.9	NA	30.9
4	Graphisoft Group	-	0	0.1	122.9	1.7
5	Matra Datavision	-	-	0.8	NA	12.0
6	Mentor Graphics	0.1	0.2	0.8	392.5	13.5
7	Siemens Nixdorf Info systeme	1.8	1.7	1.7	3.1	27.3
	Other Companies	0	0	0.3	978.1	5.4
	All N.A. Companies	0.1	0.2	2.8	1,519.4	44.4
	All European Companies	1.8	2.1	3.1	50.0	50.2
	All Asian Companies	-	-	-	NA	-
	All Companies	2.0	2.3	6.3	172.6	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-21
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Central Europe Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	EDS Unigraphics	4.4	4.9	7.0	42.1	25.7
2	Intergraph	-	4.2	4.5	7.4	16.4
3	IBM	2.6	3.9	2.9	-24.7	10.8
4	SDRC	1.3	1.3	1.9	38.0	6.9
5	Dassault*	-	2.2	1.6	-30.0	5.8
6	Han Dataport	-	-	1.3	NA	4.8
7	ESRI	-	-	1.0	NA	3.6
8	Graphisoft Group	-	0.2	0.9	252.6	3.2
9	Computervision	-	0.9	0.9	-9.3	3.2
10	Matra Datavision	-	-	0.8	NA	2.8
11	Nemetschek	-	-	0.6	NA	2.1
12	Delcam International	-	0.4	0.6	47.1	2.1
13	ISD Software	-	0.5	0.5	8.6	2.0
14	CNC Software	0.4	0.4	0.5	27.1	1.7
15	Cimatron	-	0.1	0.3	108.8	1.0
16	Wiechers Datentechnik	-	-	0.2	NA	0.9
17	Hewlett-Packard	-	0.2	0.2	7.9	0.9
18	Altium*	0.5	0.3	0.2	-30.2	0.8
19	Gerber Systems	-	0.2	0.2	-4.3	0.8
20	Tebis	-	-	0.2	NA	0.8
21	ADRA Systems	-	0.1	0.2	11.5	0.6
22	ICEM Technologies	-	1.1	0.1	-90.3	0.4
23	PADS Software	-	-	0.1	NA	0.4
24	MOSS Systems Group	-	0.1	0.1	18.1	0.3
25	Laser-Scan	-	-	0.1	NA	0.2
26	Vero International Software	-	0	0	45.3	0.1
27	EA Systems	-	0	0	-10.0	0.1
28	ULTImate Technology	-	-	0	NA	0
	Other Companies	0.9	1.8	2.3	22.4	8.3
	All N.A. Companies	8.6	16.2	19.2	18.7	70.9
	All European Companies	-	2.5	5.6	126.9	20.7
	All Asian Companies	-	-	-	NA	-
	All Companies	9.5	20.5	27.1	32.1	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-22
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Central Europe Software Companies, Mechanical, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	EDS Unigraphics	4.4	4.9	7.0	42.1	40.5
2	IBM	2.5	3.4	2.5	-24.6	14.7
3	SDRC	1.3	1.3	1.9	38.0	10.8
4	Dassault*	-	2.2	1.5	-30.0	9.0
5	Computervision	-	0.9	0.8	-6.5	4.6
6	Matra Datavision	-	-	0.8	NA	4.4
7	Han Dataport	-	-	0.6	NA	3.7
8	Delcam International	-	0.4	0.6	47.1	3.3
9	ISD Software	-	0.5	0.5	8.2	3.1
10	CNC Software	0.4	0.4	0.5	27.1	2.7
11	Intergraph	-	0.4	0.4	-0.9	2.3
12	Cimatron	-	0.1	0.3	108.8	1.6
13	Gerber Systems	-	0.2	0.2	-4.3	1.3
14	Tebis	-	-	0.2	NA	1.2
15	ADRA Systems	-	0.1	0.2	11.5	1.0
16	Altium*	0.4	0.2	0.2	-25.3	0.9
17	ICEM Technologies	-	1.1	0.1	-90.3	0.6
18	Vero International Software	-	0	0	45.3	0.2
19	Graphisoft Group	-	0	0	252.6	0.1
	Other Companies	0.4	0.5	0.7	23.9	3.9
	All N.A. Companies	8.5	11.6	13.4	15.5	77.9
	All European Companies	-	2.2	3.1	45.4	18.2
	All Asian Companies	-	-	-	NA	-
	All Companies	8.9	14.3	17.2	20.3	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-23
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Central Europe Software Companies, AEC, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Intergraph	-	0.9	1.0	6.6	27.0
2	Graphisoft Group	-	0.2	0.8	252.6	23.2
3	Han Dataport	-	-	0.7	NA	17.9
4	Nemetschek	-	-	0.6	NA	16.0
5	IBM	0	0.4	0.3	-28.0	7.3
6	MOSS Systems Group	-	0.1	0.1	18.1	2.4
7	Computervision	-	0.1	0.1	-18.4	1.6
8	Altium*	0	0.1	0	-37.3	0.9
9	Dassault*	-	0	0	-32.5	0.8
10	EA Systems	-	0	0	-10.0	0.5
	Other Companies	0	0.2	0.1	-10.2	4.1
	All N.A. Companies	0	1.4	1.3	-4.2	36.5
	All European Companies	-	0.3	2.2	590.8	59.5
	All Asian Companies	-	-	-	NA	-
	All Companies	0.1	1.9	3.6	95.3	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-24
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Central Europe Software Companies, GIS/Mapping, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Intergraph	-	2.8	3.0	9.4	59.0
2	ESRI	-	-	1.0	NA	18.9
3	IBM	-	0.1	0.1	-2.6	1.8
4	Laser-Scan	-	-	0.1	NA	1.3
5	Computervision	-	0	-	-100.0	-
	Other Companies	-	0.7	1.0	32.4	19.0
	All N.A. Companies	-	2.9	4.1	42.1	79.7
	All European Companies	-	-	0.1	NA	1.3
	All Asian Companies	-	-	-	NA	-
	All Companies	-	3.6	5.1	41.9	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-25
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Central Europe Software Companies, Electronic Design Automation, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Wiechers Datentechnik	-	-	0.2	NA	29.6
2	Hewlett-Packard	-	0.2	0.2	7.9	29.4
3	PADS Software	-	-	0.1	NA	12.3
4	Intergraph	-	0.1	0.1	-17.5	6.7
5	IBM	0.1	0.1	0	-41.4	4.3
6	Altium*	0.1	0.1	0	-41.4	4.3
7	ISD Software	-	0	0	27.6	1.8
8	ULTImate Technology	-	-	0	NA	1.1
	Other Companies	0	0.1	0.1	48.0	14.8
	All N.A. Companies	0.1	0.3	0.4	23.5	52.7
	All European Companies	-	0	0.3	2,156.7	32.6
	All Asian Companies	-	-	-	NA	-
	All Companies	0.1	0.4	0.8	85.0	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table B-5
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Central Europe Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	ADRA Systems	-	0.1	0.2	11.5	0.6
2	Altium*	0.5	0.3	0.2	-30.2	0.8
3	Cimatron	-	0.1	0.3	108.8	1.0
4	CNC Software	0.4	0.4	0.5	27.1	1.7
5	Computervision	-	0.9	0.9	-9.3	3.2
6	Dassault*	-	2.2	1.6	-30.0	5.8
7	Delcam International	-	0.4	0.6	47.1	2.1
8	EA Systems	-	0	0	-10.0	0.1
9	EDS Unigraphics	4.4	4.9	7.0	42.1	25.7
10	ESRI	-	-	1.0	NA	3.6
11	Gerber Systems	-	0.2	0.2	-4.3	0.8
12	Graphisoft Group	-	0.2	0.9	252.6	3.2
13	Han Dataport	-	-	1.3	NA	4.8
14	Hewlett-Packard	-	0.2	0.2	7.9	0.9
15	IBM	2.6	3.9	2.9	-24.7	10.8
16	ICEM Technologies	-	1.1	0.1	-90.3	0.4
17	Intergraph	-	4.2	4.5	7.4	16.4
18	ISD Software	-	0.5	0.5	8.6	2.0
19	Laser-Scan	-	-	0.1	NA	0.2
20	Matra Datavision	-	-	0.8	NA	2.8
21	MOSS Systems Group	-	0.1	0.1	18.1	0.3
22	Nemetschek	-	-	0.6	NA	2.1
23	PADS Software	-	-	0.1	NA	0.4
24	SDRC	1.3	1.3	1.9	38.0	6.9
25	Tebis	-	-	0.2	NA	0.8
26	ULTImate Technology	-	-	0	NA	0
27	Vero International Software	-	0	0	45.3	0.1
28	Wiechers Datentechnik	-	-	0.2	NA	0.9
	Other Companies	0.9	1.8	2.3	22.4	8.3
	All N.A. Companies	8.6	16.2	19.2	18.7	70.9
	All European Companies	-	2.5	5.6	126.9	20.7
	All Asian Companies	-	-	-	NA	-
	All Companies	9.5	20.5	27.1	32.1	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-26
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Rest of Europe Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Autodesk	10.6	15.8	18.0	14.0	17.6
2	IEZ	4.0	9.2	8.4	-8.3	8.2
3	Siemens Nixdorf Info systeme	6.6	5.9	5.9	1.2	5.8
4	Parametric Technology	0.7	2.6	4.5	72.4	4.4
5	RIB/Bausoftware	1.3	2.6	4.1	61.0	4.0
6	MacNeal-Schwendler	4.1	5.3	3.5	-33.4	3.4
7	Intergraph	12.0	3.1	3.3	6.0	3.2
8	Cadence	4.7	3.0	3.2	6.9	3.1
9	Technische Computer Systeme	1.8	2.2	2.8	26.1	2.7
10	Soft-Tech Software Technologies	1.6	2.1	2.7	31.1	2.6
11	Applicon	5.2	3.1	2.7	-12.2	2.6
12	Sagantec	3.7	2.8	2.5	-10.7	2.4
13	ESRI	2.0	5.5	2.4	-56.1	2.4
14	Matra Datavision	1.9	1.1	2.3	113.9	2.2
15	IBM	3.3	2.8	2.0	-30.1	1.9
16	Ziegler Informatics	1.6	2.0	1.4	-27.9	1.4
17	Wiechers Datentechnik	0.9	1.8	1.4	-25.8	1.3
18	Han Dataport	5.0	4.1	1.3	-68.5	1.3
19	Synopsys	0.9	1.1	1.2	7.5	1.2
20	Mentor Graphics	0.7	1.2	1.2	-1.5	1.2
21	ACA Ltd.	0.9	1.1	1.1	0.5	1.1
22	Investronica SA	0.8	0.8	1.1	33.7	1.1
23	UNISYS	0.9	1.0	1.1	10.3	1.1
24	COMPASS Design Automation	1.5	1.1	1.0	-3.0	1.0
25	CAD Centre	0.7	0.7	0.9	37.3	0.9
26	RoboCAD Solutions	0.5	0.6	0.9	57.8	0.9
27	SDRC	0.5	0.6	0.9	44.6	0.8
28	Smallworld Systems	0.3	2.1	0.9	-58.8	0.8
29	Laser-Scan	0.2	0.7	0.8	28.0	0.8
30	APIC Systemes	0.5	0.6	0.7	23.6	0.7
	Other Companies	7.1	6.8	6.0	-11.9	5.9
	All N.A. Companies	67.7	56.8	49.6	-12.7	48.4
	All European Companies	68.6	68.1	46.8	-31.2	45.7
	All Asian Companies	-	-	-	NA	-
	All Companies	143.4	131.7	102.4	-22.2	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-27
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Rest of Europe Software Companies, Mechanical, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Autodesk	4.2	6.3	7.2	14.3	20.6
2	Parametric Technology	0.7	2.6	4.5	72.4	12.8
3	MacNeal-Schwendler	4.1	5.1	3.2	-37.4	9.1
4	Applicon	5.2	3.1	2.7	-12.2	7.7
5	Matra Datavision	1.8	1.0	2.3	118.0	6.5
6	IBM	2.1	2.3	1.6	-31.0	4.6
7	Investronica SA	0.8	0.8	1.1	33.7	3.2
8	Wiechers Datentechnik	0.8	0.9	1.0	12.2	2.9
9	Siemens Nixdorf Info systeme	1.2	1.0	1.0	-5.8	2.8
10	SDRC	0.5	0.6	0.9	44.6	2.5
11	Technische Computer Systeme	0.7	0.7	0.8	24.6	2.3
12	Han Dataport	2.5	2.0	0.6	-68.9	1.8
13	Intergraph	2.0	0.6	0.6	-0.9	1.6
14	Gerber Systems	0.2	0.4	0.5	20.2	1.5
15	Computervision	4.8	1.0	0.5	-49.0	1.4
16	Exapt	0.5	0.6	0.5	-16.1	1.3
17	RoboCAD Solutions	0.2	0.3	0.5	57.8	1.3
18	Tebis	1.0	0.8	0.4	-46.8	1.2
19	Kloeckner-Moeller	0.4	0.4	0.4	2.4	1.2
20	Ansys	1.4	0.4	0.4	9.1	1.2
21	Ziegler Informatics	0.6	0.8	0.4	-50.0	1.1
22	Straessle Informationssysteme	5.2	5.1	0.4	-92.7	1.1
23	EDS Unigraphics	3.5	4.0	0.3	-91.4	1.0
24	CAD Lab	0.1	0.1	0.3	146.7	0.8
25	Cimatron	-	0.2	0.3	25.5	0.8
26	PAFEC	0.3	0.3	0.3	3.8	0.8
27	Altium*	0.4	0.2	0.2	-5.4	0.7
28	ASCAD	0.3	0.3	0.2	-12.4	0.7
29	MCS	0.1	0.2	0.1	-29.2	0.4
30	CNC Software	0.1	0.1	0.1	27.1	0.4
	Other Companies	1.6	1.3	1.2	-13.1	3.3
	All N.A. Companies	32.9	27.4	22.8	-16.6	65.3
	All European Companies	30.9	20.4	11.0	-46.1	31.4
	All Asian Companies	-	-	-	NA	-
	All Companies	65.4	49.1	35.0	-28.7	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-28
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Rest of Europe Software Companies, AEC, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	IEZ	4.0	9.2	8.4	-8.3	25.8
2	Autodesk	4.6	6.8	7.8	15.6	24.1
3	RIB/Bausoftware	1.0	2.0	3.2	54.9	9.7
4	Soft-Tech Software Technologies	1.6	2.1	2.7	31.1	8.3
5	Technische Computer Systeme	1.0	1.3	1.7	31.3	5.3
6	ACA Ltd.	0.9	1.1	1.1	0.5	3.4
7	Intergraph	4.0	1.0	1.1	6.6	3.4
8	CAD Centre	0.5	0.6	0.9	37.3	2.7
9	Ziegler Informatics	0.2	0.3	0.7	128.5	2.2
10	Han Dataport	2.5	2.1	0.7	-68.1	2.0
11	RoboCAD Solutions	0.3	0.3	0.5	57.8	1.4
12	Hochtief	0.2	0.3	0.4	41.3	1.1
13	Sener Inginiera y Sistemaus	0.2	0.3	0.3	23.1	1.0
14	Isicad	1.6	1.0	0.3	-70.8	0.9
15	M.O.C.	0.4	0.4	0.3	-32.5	0.9
16	Kockums Computer Systems	0.5	0.2	0.3	22.7	0.8
17	Graphisoft Group	1.0	0.3	0.3	-7.0	0.8
18	Star Informatic	1.1	0.2	0.2	22.2	0.7
19	Triplan	0.2	0.2	0.2	5.0	0.6
20	Computer Services Consultants	0.1	0.2	0.2	25.0	0.6
21	IBM	0.9	0.3	0.2	-33.8	0.5
22	FHECOR*	0.1	0.1	0.1	22.2	0.3
23	Ground Modelling Systems	0	0	0.1	50.0	0.2
24	Altium*	0.1	0.1	0	-26.8	0.1
25	Computervision	0.7	0.1	0	-68.7	0.1
26	PAFEC	0	0	0	-	0.1
27	Gable CAD Systems	0	0	0	-34.0	0
28	GDS	0.3	0.1	0	-92.8	0
29	Nemetschek	1.6	3.1	-	-100.0	-
30	CAD Distribution	1.9	2.9	-	-100.0	-
	Other Companies	1.1	1.1	1.1	-5.2	3.2
	All N.A. Companies	12.0	9.4	9.5	1.2	29.1
	All European Companies	21.9	28.2	22.0	-21.7	67.7
	All Asian Companies	-	-	-	NA	-
	All Companies	34.9	38.6	32.6	-15.7	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-29
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Rest of Europe Software Companies, GIS/Mapping, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Siemens Nixdorf Info systeme	5.3	4.7	4.9	3.1	25.9
2	ESRI	2.0	5.5	2.4	-56.1	12.8
3	Autodesk	1.2	1.7	2.0	15.0	10.6
4	Intergraph	5.3	1.5	1.6	9.4	8.4
5	UNISYS	0.9	1.0	1.1	10.3	5.8
6	RIB/Bausoftware	0.3	0.5	1.0	85.0	5.1
7	Smallworld Systems	0.3	2.1	0.9	-58.8	4.5
8	Laser-Scan	0.2	0.7	0.8	28.0	4.4
9	APIC Systemes	0.5	0.6	0.7	23.6	3.9
10	Sysdeco Innovation	0.7	0.6	0.7	21.4	3.6
11	Ziegler Informatics	0.2	0.3	0.3	0.2	1.5
12	Enghouse Systems Ltd.	0.1	0.2	0.3	1.1	1.3
13	IBM	0.3	0.2	0.2	-2.6	0.9
14	Geometria GIS Systems House	0.2	0.1	0.1	-19.3	0.5
15	PAFEC	0.1	0.1	0.1	14.3	0.4
16	Ground Modelling Systems	0	0.1	0.1	16.7	0.4
17	Triplan	0	0	0.1	25.0	0.3
18	GDS	0.1	0	0	-39.7	0.1
19	Straessle Informationssysteme	1.1	2.8	-	-100.0	-
20	CAD Distribution	0.1	0.2	-	-100.0	-
21	Computervision	0.1	0	-	-100.0	-
22	Lamp Software	0	0	-	-100.0	-
	Other Companies	2.4	2.6	1.8	-30.8	9.5
	All N.A. Companies	10.0	10.2	7.5	-25.8	39.9
	All European Companies	9.0	12.7	9.5	-25.0	50.5
	All Asian Companies	-	-	-	NA	-
	All Companies	21.4	25.5	18.9	-25.9	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-30
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Rest of Europe Software Companies, Electronic Design Automation, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Cadence	4.7	3.0	3.2	6.9	19.3
2	Sagantec	3.7	2.8	2.5	-10.7	14.7
3	Synopsys	0.9	1.1	1.2	7.5	7.2
4	Mentor Graphics	0.7	1.2	1.2	-1.5	7.1
5	COMPASS Design Automation	1.5	1.1	1.0	-3.0	6.1
6	Autodesk	0.6	0.9	0.9	-1.2	5.6
7	Viewlogic Systems	0.3	1.3	0.6	-57.1	3.3
8	Hewlett-Packard	1.6	0.5	0.5	7.9	3.1
9	Aucotec	0.4	0.7	0.5	-26.9	2.9
10	Summitt Design	0.5	0.4	0.4	3.6	2.6
11	Wiechers Datentechnik	0.1	1.0	0.4	-61.4	2.2
12	MacNeal-Schwendler	0	0.2	0.3	101.3	1.8
13	PADS Software	-	0.1	0.3	180.9	1.5
14	Technische Computer Systeme	0.2	0.2	0.2	-	1.3
15	Kloeckner-Moeller	0.3	0.3	0.2	-22.2	1.3
16	CAD-UL	0.4	0.2	0.2	-25.6	0.9
17	ISDATA	0.1	0.1	0.1	-9.7	0.8
18	Norlinvest Ltd.	0.1	0.1	0.1	-8.3	0.7
19	Siemens Nixdorf Info systeme	0.1	0.1	0.1	-22.6	0.4
20	Intergraph	0.6	0.1	0.1	-17.5	0.3
21	Ziegler Informatics	0.5	0.6	0	-92.2	0.3
22	IBM	0.1	0.1	0	-57.4	0.2
23	Altium*	0.1	0.1	0	-57.4	0.2
24	Intusoft	-	-	0	NA	0.2
25	ALS Design	0.2	0	0	134.1	0.1
26	ISD Software	0.1	0	0	27.6	0
27	CAD Distribution	0.7	0.8	-	-100.0	-
28	ULTImate Technology	0.1	0	-	-100.0	-
29	EME	0	0	-	-100.0	-
	Other Companies	2.8	2.6	2.7	2.0	15.9
	All N.A. Companies	12.9	9.9	9.7	-1.6	58.4
	All European Companies	6.8	6.9	4.3	-37.5	25.6
	All Asian Companies	-	-	-	NA	-
	All Companies	22.6	19.4	16.7	-13.8	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table B-6
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Rest of Europe Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	ACA Ltd.	0.9	1.1	1.1	0.5	1.1
2	Access Corp.	-	-	0	NA	0
3	ALS Design	0.2	0	0	134.1	0
4	Altium*	0.5	0.4	0.3	-18.3	0.3
5	Anilam Electronics	0.1	0.1	0.1	-	0.1
6	Ansys	1.4	0.4	0.4	9.1	0.4
7	APIC Systemes	0.5	0.6	0.7	23.6	0.7
8	Applicon	5.2	3.1	2.7	-12.2	2.6
9	ASCAD	0.3	0.3	0.2	-12.4	0.2
10	ASHLAR	-	-	-	NA	-
11	Aucotec	0.4	0.7	0.5	-26.9	0.5
12	Autodesk	10.6	15.8	18.0	14.0	17.6
13	B.A.Intelligence Networks	0	0	0.1	56.7	0.1
14	BATISOFT	0.4	0.2	-	-100.0	-
15	CAD Centre	0.7	0.7	0.9	37.3	0.9
16	CAD Distribution	6.3	7.0	-	-100.0	-
17	CAD Lab	0.1	0.1	0.3	146.7	0.3
18	CAD-UL	0.4	0.2	0.2	-25.6	0.2
19	Cadence	4.7	3.0	3.2	6.9	3.1
20	CAMAX Manufacturing	-	0	0.1	190.6	0.1
21	CAMTEK	0.1	0.1	-	-100.0	-
22	CATALPA groupe Missler	0	0	0	-72.9	0
23	Cimatron	-	0.2	0.3	25.5	0.3
24	CIMTEK*	-	0.9	-	-100.0	-
25	CNC Software	0.1	0.1	0.1	27.1	0.1
26	COMPASS Design Automation	1.5	1.1	1.0	-3.0	1.0
27	Computer Services Consultants	0.1	0.2	0.2	25.0	0.2
28	Computervision	5.8	1.1	0.5	-52.1	0.5
29	Datagraphic	0.1	0.1	-	-100.0	-
30	Delcam International	-	0.2	0.1	-72.1	0.1
31	DP Technology	-	-	-	NA	-
32	EA Systems	-	-	-	NA	-
33	EDS Unigraphics	3.5	4.0	0.3	-91.4	0.3
34	EME	0.1	0	-	-100.0	-
35	Enghouse Systems Ltd.	0.1	0.2	0.3	1.1	0.2
36	ESRI	2.0	5.5	2.4	-56.1	2.4
37	Exapt	0.5	0.6	0.5	-16.1	0.5

(Continued)

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Table B-6 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Rest of Europe Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
38	FEA	0	0	-	-100.0	-
39	FHECOR*	0.1	0.1	0.1	18.2	0.1
40	Framasoft	0.2	0.2	0.1	-57.1	0.1
41	Gable CAD Systems	0	0	0	-34.0	0
42	GDS	0.4	0.2	0	-81.0	0
43	Geometria GIS Systems House	0.2	0.1	0.1	-19.3	0.1
44	Gerber Systems	0.2	0.4	0.5	20.2	0.5
45	GRAFTEK	0	0	0	7.1	0
46	Graphisoft Group	1.2	0.3	0.3	-7.0	0.3
47	Ground Modelling Systems	0.1	0.1	0.1	30.0	0.1
48	Han Dataport	5.0	4.1	1.3	-68.5	1.3
49	Hewlett-Packard	4.6	0.7	0.5	-23.1	0.5
50	Hochtief	0.2	0.3	0.4	41.3	0.3
51	IBM	3.3	2.8	2.0	-30.1	1.9
52	IEZ	4.0	9.2	8.4	-8.3	8.2
53	Intergraph	12.0	3.1	3.3	6.0	3.2
54	Intusoft	-	-	0	NA	0
55	Investronica SA	0.8	0.8	1.1	33.7	1.1
56	ISD Software	3.2	1.1	0.1	-87.4	0.1
57	ISDATA	0.1	0.1	0.1	-9.7	0.1
58	Isicad	2.6	1.5	0.3	-80.0	0.3
59	Kloeckner-Moeller	0.7	0.7	0.6	-7.2	0.6
60	Kockums Computer Systems	0.5	0.2	0.3	22.7	0.3
61	Kreon	0.1	0	-	-100.0	-
62	Lamp Software	0.4	0.5	-	-100.0	-
63	Laser-Scan	0.2	0.7	0.8	28.0	0.8
64	M.O.C.	0.4	0.4	0.3	-32.5	0.3
65	Macao Systems	0.2	0.2	-	-100.0	-
66	MacNeal-Schwendler	4.1	5.3	3.5	-33.4	3.4
67	Matra Datavision	1.9	1.1	2.3	113.9	2.2
68	MCS	0.1	0.2	0.1	-29.2	0.1
69	Mentor Graphics	0.7	1.2	1.2	-1.5	1.2
70	Nemetschek	1.6	3.1	-	-100.0	-
71	Norlinvest Ltd.	0.1	0.1	0.1	-8.3	0.1
72	PADS Software	-	0.1	0.3	180.9	0.3
73	PAFEC	0.4	0.4	0.4	5.7	0.4
74	Parametric Technology	0.7	2.6	4.5	72.4	4.4

(Continued)

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Table B-6 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Rest of Europe Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
75	Pathtrace Engineering Systems	0.1	0	0	-	0
76	Radan Computational	0.1	0.1	0.1	18.2	0.1
77	RIB/Bausoftware	1.3	2.6	4.1	61.0	4.0
78	RoboCAD Solutions	0.5	0.6	0.9	57.8	0.9
79	Sagantec	3.7	2.8	2.5	-10.7	2.4
80	SDRC	0.5	0.6	0.9	44.6	0.8
81	Sener Inginiera y Sistemaus	0.2	0.3	0.3	23.1	0.3
82	Siemens Nixdorf Info systeme	6.6	5.9	5.9	1.2	5.8
83	Smallworld Systems	0.3	2.1	0.9	-58.8	0.8
84	Soft-Tech Software Technologies	1.6	2.1	2.7	31.1	2.6
85	Star Informatic	1.1	0.2	0.2	22.2	0.2
86	Straessle Informationssysteme	6.3	7.9	0.4	-95.3	0.4
87	Summitt Design	0.5	0.4	0.4	3.6	0.4
88	Superdraft	0	0	0	8.0	0
89	Synopsys	0.9	1.1	1.2	7.5	1.2
90	Sysdeco Innovation	0.7	0.6	0.7	21.4	0.7
91	Tebis	1.0	0.8	0.4	-46.8	0.4
92	Technische Computer Systeme	1.8	2.2	2.8	26.1	2.7
93	Triplan	0.3	0.2	0.3	8.3	0.3
94	ULTImate Technology	0.1	0	-	-100.0	-
95	UNISYS	0.9	1.0	1.1	10.3	1.1
96	Viewlogic Systems	0.3	1.3	0.6	-57.1	0.5
97	Wiechers Datentechnik	0.9	1.8	1.4	-25.8	1.3
98	Ziegler Informatics	1.6	2.0	1.4	-27.9	1.4
	Other Companies	7.1	6.8	6.0	-11.9	5.9
	All N.A. Companies	67.7	56.8	49.6	-12.7	48.4
	All European Companies	68.6	68.1	46.8	-31.2	45.7
	All Asian Companies	-	-	-	NA	-
	All Companies	143.4	131.7	102.4	-22.2	100.0

NA = Not applicable
*Company statistics contain VAR/distributor revenue not counted in total
Source: Dataquest (August 1995)

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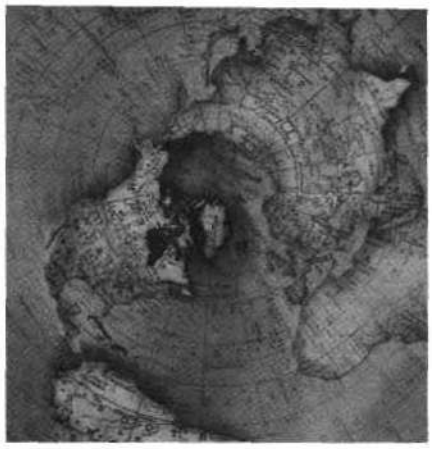
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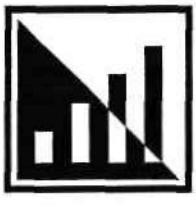
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1994 CAD/CAM/CAE/GIS Europe Market Share Update



Market Statistics

Program: CAD/CAM/CAE/GIS Europe
Product Code: CCAM-EU-MS-9502
Publication Date: September 25, 1995
Filing: Market Analysis

1994 CAD/CAM/CAE/GIS Europe Market Share Update



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Note: All tables show estimated data.

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1994 CAD/CAM/CAE/GIS Europe Market Share Update

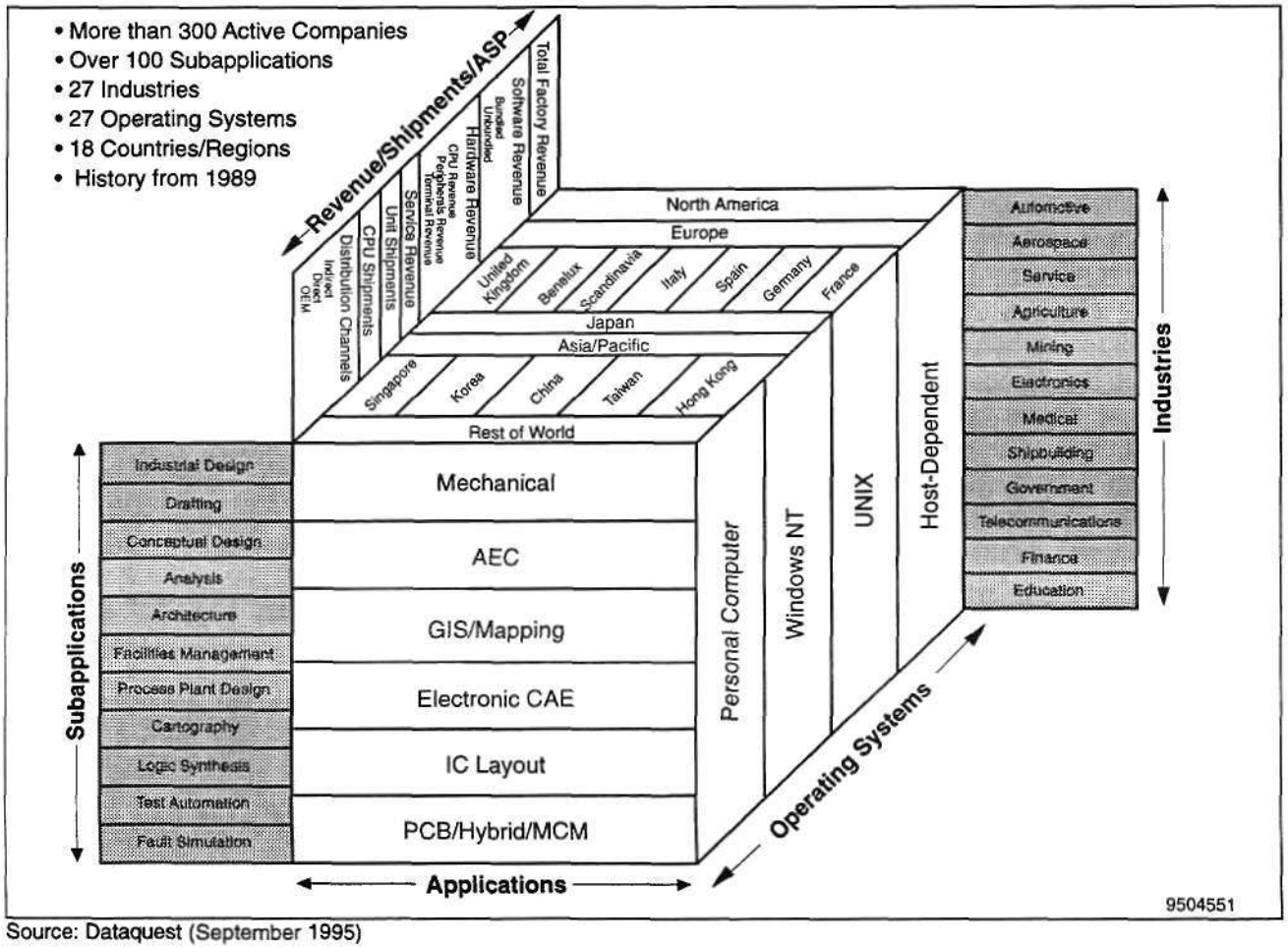
Introduction

CAD/CAM/CAE/GIS systems have dramatically changed the methods by which designers and production managers originate and implement products. CAD and CAE systems allow designers to create, draft, analyze, test, and manipulate products on a screen in two and three dimensions. As CAD/CAM/CAE/GIS systems continue to decrease in cost, they become more available and cost-justifiable to new users.

In order to provide a comprehensive view of the CAD/CAM/CAE/GIS industry, Dataquest's CAD/CAM/CAE/GIS group maintains a large database of industry information. The type of information contained in the database is depicted in Figure 1.

Table 1 summarizes the performance in various segments of the CAD/CAM/CAE/GIS markets in 1994 versus 1993.

Figure 1
CAD/CAM/CAE/GIS Market Database



Source: Dataquest (September 1995)

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Table 1
CAD/CAM/CAE/GIS Market Summary, 1993 to 1994

	Software Revenue		1993-1994	Total Factory Revenue		1993-1994	Seat Shipments		1993-1994
	1993	1994	Growth (%)	1993	1994	Growth (%)	1993	1994	Growth (%)
Applications									
Mechanical	2,248.9	2,455.5	9.2	7,374.9	7,968.8	8.1	279,480	298,442	6.8
AEC	752.3	849.0	12.9	2,204.7	2,401.1	8.9	198,114	211,550	6.8
GIS/Mapping	793.1	917.2	15.7	2,129.2	2,420.9	13.7	88,672	108,107	21.9
Electronic CAE	803.3	886.3	10.3	2,297.0	2,482.2	8.1	94,651	108,019	14.1
IC Layout	180.8	216.9	20.0	601.0	721.7	20.1	10,911	12,740	16.8
PCB/MCM/Hybrid	244.0	252.1	3.3	789.8	788.3	-0.2	29,042	27,766	-4.4
Electronic Design Automation	1,228.0	1,355.2	10.4	3,687.8	3,992.2	8.3	134,604	148,525	10.3
All Applications	5,022.3	5,577.0	11.0	15,396.6	16,782.9	9.0	700,869	766,623	9.4
Region									
North America	1,856.7	2,045.6	10.2	5,614.9	6,189.1	10.2	312,240	343,290	9.9
Europe	1,660.3	1,864.4	12.3	5,272.8	5,750.2	9.1	237,945	258,480	8.6
Japan	1,203.4	1,315.8	9.3	3,728.1	3,909.9	4.9	99,963	102,239	2.3
Asia/Pacific	208.0	255.4	22.8	538.2	676.9	25.8	33,753	44,643	32.3
Rest of World	93.9	95.8	2.0	242.6	256.9	5.9	16,968	17,971	5.9
Worldwide	5,022.3	5,577.0	11.0	15,396.6	16,782.9	9.0	700,869	766,623	9.4
Operating System									
UNIX	3,466.6	3,874.3	11.8	10,861.7	11,946.9	10.0	192,244	221,152	15.0
Host	301.4	197.9	-34.3	1,616.0	1,269.4	-21.5	27,091	21,566	-20.4
Windows NT	5.5	106.4	1,845.3	10.3	282.7	2,644.1	226	6,764	2,892.9
PC	1,248.9	1,398.3	12.0	2,908.5	3,283.9	12.9	481,308	517,141	7.4
All Operating Systems	5,022.3	5,577.0	11.0	15,396.6	16,782.9	9.0	700,869	766,623	9.4

Note: This table includes software content (data) companies for GIS/mapping. However, the AEC and GIS market share book (*1994 CAD/CAM/CAE/GIS AEC and GIS Market Share*, CAEC-WW-MS-9501) does not.
Source: Dataquest (September 1995)

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About This Document

This document contains Dataquest's detailed market share information on the CAD/CAM/CAE/GIS industry. The following list contains descriptions of the companies included in the Market Share books. See Tables 2, 3, 4, and 5 for changes from our 1993 report.

- Mechanical applications—All companies in database with mechanical revenue
- GIS and AEC applications—All companies in database with GIS revenue and all companies in database with AEC revenue. We also have added GIS data companies.
- Electronic design automation applications—All companies in database with EDA (electronic CAE, IC layout, PCB/hybrid/MCM) revenue
- Europe overview—All companies with European revenue
- Asia—All companies with Asian revenue

We no longer publish top-level market statistics for the entire CAD/CAM/CAE/GIS industry. This data is available by calling Suzanne Snygg at (408) 468-8124. More detailed data on these markets may be requested through our client inquiry service.

We no longer publish data by hardware platform; instead we report by four major operating systems: UNIX, host, Windows NT, and PC.

This document represents our final estimates of 1994 shipments and revenue.

Dataquest's policy is to continually update its market information, for current and past years, with any new data received in order to arrive at the most accurate market representation possible.

Table 2
Companies Renamed Since 1993

Original Company Name	New Company Name
ACDS Graphic System	Geomax International
Genrad	VEDA
GeoVision	SHL Systemhouse
Graphisoft Software Dev	Graphisoft Group
ICAD	Concentra
Kohns & Poppenhaeger	Poppenhaeger Grips GmbH
Microway	M.O.C.
Scientific & Engineering Software	SES Inc.
Silvar-Lisco	SVRI (Silicon Valley Research Inc.)
Smallworld Systems	SmallworldWide
Swanson Analysis	Ansys
Tactics International	Tactician Corporation

Source: Dataquest (September 1995)

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Table 3
Companies (or CAD Portions of Companies) Sold/Merged in 1994

Company Name	Acquired by/Merged with
Aries Technology	MacNeal-Schwendler
ANACAD-EES	Mentor Graphics
Betronex & Visionics	Norlinvest Ltd.
Cisigraph	Matra
Digital—Mechanical Software	PROCAD GmbH
Chronological Simulation	Viewlogic
Computervision—GIS	Unisys
Control Data—Mechanical Software	ICEM Technologies
Foresight Resources	Softdesk
Generation 5 Technology	Geo/SQL Corporation
Gerber Systems (CAD portion)	Matra
Kork Systems	Autometric
LandCadd	Eagle Point
Logic Modeling Corp.	Synopsys
Massteck	OrCAD
Model Technology	Mentor Graphics
NeoCAD	Xilinx
PDA Engineering	MacNeal-Schwendler
Point Control	CAMAX Manufacturing
Racal-Redac	Zuken-Redac
Sunrise	Viewlogic
Syscan	Sysdeco Innovation

Source: Dataquest (September 1995)

Table 4
Companies Deleted from Database Since 1993

Region/Company	
North American	European
A.I. Systems	Aplein*
Apple Computer	Aucos elektronische
Aura CAD/CAM Systems	BATISOFT
CAE-link	CAD-Capture
Claris	CAD TECH Iberica*
Compact Software	CAMTEK
Control Data—Hardware	Caroline Informatique
Data General	Contract Data Research
ECOM Associates	Data Technology/DATECH*
Georgia Tech Research	Datagraphic
GEOVISION Inc.	DELTA CAD*
Infinite Graphics	EME

(Continued)

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Table 4
Companies Deleted from Database Since 1993 (Continued)

Region/Company	
North American (Continued)	European (Continued)
Innovative Data Design	FEA
Intrinsix	FEGS
Land Innovation	ItalCad
Maptech	Kreon
MC2 Engineering Software	Lamp Software
Moda CAD	Logic Systems Designers*
Phase Three Logic	Macao Systems
Synercom	MEDESIGN
Teradyne	Mucke Software
Understanding Systems	S.T.L.D.s.r.l.
Asian	Soft*
Kanematsu Semiconductor*	

*Distributors
Source: Dataquest (September 1995)

Table 5
Companies Added to Database Since 1993

Region/Company	
North American	European
3Soft	Abstract Hardware
Access Corp.	ACA Ltd.
ArcSys	Cimtel Ltd.
B.A. Intelligence Networks	Eigner + Partner GmbH
Boothroyd Dewhurst	HoSoft CAD
Cadis Software	Speed
CGTech	Spot Image Corp.
Chronology	ULTimate Technology
Cimplex	WiN Technology
Claritas/NPDC	
CMstat	
CSAR Corp.	
Database Applications Inc.	
Deneb Robotics	
DB Technology	
Design Acceleration	
Eagle Point	
EOSAT	
Equifax/NDS	
Fintronic	
Formtek	
Geographic Data Technology	
Gibbs and Assoc.	

(Continued)

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Table 5
Companies Added to Database Since 1993 (Continued)

Region/Company
North American (Continued)
Integrity Engineering
InterHDL
Intusoft
Livermore Software Tech. Corp.
Nextwave DA
NOVASOFT Systems
OEA International
Optem Engineering
Rebis (merger of EDA and ADev)
Sherpa Corp.
Simulation Technology
SRAC
Surfware
T D Technology
Tecnomatics Tech.
UniCAD
Variation Systems Analysis
Veritools
VISTA Environmental Inf.
Workgroup Tech

*Distributors
Source: Dataquest (September 1995)

Segmentation Definitions

This section lists the definitions specific to this document. The following paragraphs define the segments.

Applications

Mechanical

The mechanical segment refers to computer-aided tools used by engineers, designers, analysts, technicians, and draftspeople working predominantly in the discrete manufacturing industries, but includes government and education. Users of mechanical CAD/CAM/CAE tools work in all departments across the typical organization, with a majority found in product design, advanced engineering, and manufacturing engineering. Common design applications include conceptual design, industrial design, structural or thermal analysis, detail design, and electromechanical design (the mechanical part of design with electrical or electronic components and mechanisms). Common manufacturing applications include tool and fixture design, numerical control part programming, offline robotics programming, and interface to quality control systems. Management tools for database control and distribution are included in this segment, as well as user-defined application programming.

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Architecture, Engineering, and Construction (AEC)

The AEC segment covers the use of computer-aided tools by architects, contractors, plant engineers, civil engineers, and other people associated with these disciplines to aid in designing and managing buildings, industrial plants, ships, and other types of nondiscrete entities.

Geographic Information Systems (GIS)/Mapping

GIS is computer-based technology, and the segment comprises hardware, software, and data used to capture, edit, display, and analyze spatial (tagged by location) information.

Electronic Design Automation (EDA)

The EDA segment covers computer-based tools used to automate the design of an electronic product, including printed circuit boards, ICs, and systems. EDA includes ECAE, IC layout, and PCB/hybrid/MCM, as follows:

- Electronic computer-aided engineering (ECAE)—These are computer-aided tools used in the engineering or design phase of electronic products (as opposed to the physical layout phase of the product). Examples of electronic CAE applications are schematic capture and simulation.
- IC layout—This is a software application tool used to create and validate the physical implementation of an IC. The IC layout category comprises polygon editors, symbolic editors, placement and routing (gate array, cell, and block), and design verification tools (DRC/ERC/logic-to-layout).
- PCB/hybrid/MCM—This segment covers products used to create the placement and routing of the traces and components laid out on a printed circuit board. Also included in this category are thermal analysis tools.

Regions

The following paragraphs define the regions.

North America

North America includes the United States, Mexico, and Canada.

Europe

Europe includes the United Kingdom, Scandinavia, Benelux, France, Germany, Italy, Spain, and Rest of Europe.

Japan

Asia/Pacific

Asia includes Singapore, Taiwan, Korea, China, and Hong Kong.

Rest of World

Rest of World includes all other countries including Australia, New Zealand, India, Africa, Central America, South America, and the Middle East.

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Operating Systems

Dataquest defines the operating systems as follows:

- UNIX: UNIX includes all UNIX variants and older workstation operating systems.
- Host: Host includes minicomputer and mainframe operating systems in which the functions of external workstations are dependent on a host computer.
- Windows NT: Windows NT is the Microsoft operating system. We understand that code for Windows NT and Windows will be merged within the next three years. The probability is high that Microsoft will develop a client environment and a server environment. In our forecast, the future client environment is included in PC operating systems, and the future server environment is referenced as NT. Also included in NT is potential for an additional, new, high-end operating environment that could be developed by any vendor.
- PC: PC includes DOS, Windows, Windows 95, and Apple operating systems.

Metrics

The following paragraphs define measurements:

- Total factory revenue is defined as the amount of money received by a manufacturer for its goods and services measured in U.S. dollars. Total factory revenue does not include revenue that a company may receive from products that are sold to another company for resale (OEM revenue). Total factory revenue is the sum of software revenue, hardware revenue, and service revenue.
- Unit shipment is defined as the number of seats delivered (number of possible simultaneous users of product delivered) excluding OEM shipments.
- Hardware revenue is revenue derived from sales of CPUs (including operating systems), terminals (for host-dependent systems), and peripherals.
- Software revenue is revenue derived from the sale of application software that exists on a company's standard price list.
- Service revenue is defined as all revenue derived from the service and support of CAD/CAM/CAE/GIS systems. Service revenue can be calculated in the tables by subtracting hardware and software revenue from total revenue. A split by hardware service and software service is available through inquiry.
  - Maintenance fees for hardware and software
  - Management and operations services—help desk, education and training, disaster recovery, vaulting, and configuration management

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- Service bureau—project work, including construction of database, data conversion, product design, analysis, or manufacturing
- Application development—design and development of customized software applications or the modification, enhancement of customization of existing software applications, adding new functionality
- Consulting revenue—assessment of CAD/CAM/CAE/GIS business and information technology needs and the formulation of a plan based on needs identification
- Implementation and integration services—planning, implementation, migration, and integration of software products (software network support and integration, account integration management, data center design, and construction)

Market Share Methodology

Dataquest uses both primary and secondary sources to produce our market share data. In the fourth quarter of each year and second quarter of the subsequent year, we survey all participants in each industry. Each vendor is offered the opportunity to self-report the information required. Although there is a primary contact for each company, large companies are surveyed across product lines and across geographic regions. Thus there is a corresponding increase in the number of contacts at large companies. (Dataquest maintains a large contact database on all sources of information.) Examples of the job titles of people contacted for information are the following:

- President and CEO
- Vice president and general manager
- Vice president of marketing
- Vice president, strategic product planning
- Director of strategic planning
- Director of marketing
- Director of market development
- Manager, CAD/CAM/CAE/GIS marketing programs
- Market research analyst

The Audit Process

Data supplied by vendors is evaluated against information drawn from many sources, including the following:

- Revenue published by major industry participants
- Estimates made by knowledgeable and reliable industry spokespersons
- Government data or trade association data

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- Published product literature and price lists
- Interviews with knowledgeable manufacturers, distributors, and users
- Relevant economic data
- Information and data from online data banks
- Articles in both the general and trade press
- Annual reports, SEC documents, credit reports
- Company publications and press releases
- Reports from financial analysts
- User studies
- Reseller and supplier reports and reports from a vendor's competitors

Dataquest also sums vendor revenue across other industries covered by Dataquest to make sure that revenue is not credited twice, and checks with multiple sources at one company to cross-check data on that company.

Dataquest analysts have many years of experience in how to apply the tools described to get the most accurate information possible on a particular company (such as what to use when and what industry averages are). We believe that the estimates presented here are the most accurate and meaningful generally available today. It is the CAD/CAM/CAE/GIS group's policy to continually update our market information for any year, based on any new data received, in order to arrive at the most accurate market representation possible.

Dataquest's CAD/CAM/CAE/GIS market numbers are often higher than those reported by other sources. We survey worldwide, which involves more vendors, higher total market revenue, lower market share per vendor, and a more accurate market picture—which is particularly useful when comparing regions or applications.

Publishing Schedule

We publish market share and forecasting twice each year for each, allowing for both timely distribution of data and thorough analysis and forecasting. Our annual delivery schedule is as follows:

- Market share will be published and distributed to clients by March 31.
- Forecasting from the market share tables provides a five-year forecast period, available after April 30. The books will be shipped by May 31.
- Final updated market share tables, based on additional data collection and analysis, will be completed by June 30. At this point, the market share database is frozen and will not be changed until the end of the year. For the next six months, supplementary market data will be based on this final market data. Books will be shipped by July 31. (Unfortunately, because of our database changes, updated market share table delivery was delayed beyond this date.)

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- We provide complete final forecast tables by July 31. These tables take into consideration changes in the market share during the previous six months. Books will be shipped by September 31.

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Table A-1
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Europe Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	IBM	138.1	152.4	184.8	21.3	10.1
2	Autodesk	132.7	131.5	149.9	14.0	8.2
3	Intergraph	117.0	104.3	109.1	4.6	6.0
4	Computervision	150.4	102.5	98.0	-4.4	5.4
5	Dassault*	86.9	74.8	88.0	17.6	4.8
6	Siemens Nixdorf Info systeme	98.0	82.6	83.0	0.5	4.6
7	Parametric Technology	18.1	40.4	69.7	72.4	3.8
8	Matra Datavision	55.0	52.9	63.4	19.7	3.5
9	Nemetschek	32.5	44.7	58.1	30.1	3.2
10	ESRI	23.4	35.9	48.4	34.7	2.7
11	Hewlett-Packard	52.0	47.2	46.9	-0.7	2.6
12	EDS Unigraphics	33.6	37.7	44.1	17.2	2.4
13	Mentor Graphics	34.2	34.7	42.0	20.9	2.3
14	Cadence	60.9	37.7	40.3	6.9	2.2
15	IEZ	26.3	27.8	36.2	30.1	2.0
16	MacNeal-Schwendler	29.6	35.0	30.1	-14.0	1.7
17	SDRC	26.0	24.8	27.8	12.2	1.5
18	Straessle Informationssysteme	25.4	20.8	23.3	11.6	1.3
19	Landmark Graphics	12.4	21.6	23.2	7.0	1.3
20	Wiechers Datentechnik	13.2	20.7	21.5	3.8	1.2
21	RIB/Bausoftware	6.7	13.4	20.2	51.0	1.1
22	Synopsys	14.8	26.6	20.0	-24.8	1.1
23	Viewlogic Systems	9.9	14.3	18.7	31.2	1.0
24	Smallworld Systems	5.8	13.8	18.7	35.9	1.0
25	Ziegler Informatics	14.3	15.2	16.6	9.6	0.9
26	PROCAD GmbH	4.6	4.6	15.1	227.7	0.8
27	Applicon	24.6	16.2	14.2	-12.2	0.8
28	ISD Software	14.0	12.7	13.8	8.9	0.8
29	Han Dataport	13.3	10.9	13.7	26.5	0.8
30	Soft-Tech Software Technologies	10.4	11.4	13.3	16.8	0.7
	All N.A. Companies	1,030.9	1,016.5	1,153.6	13.5	63.2
	All European Companies	617.8	598.1	660.3	10.4	36.2
	All Asian Companies	19.4	13.4	10.3	-23.2	0.6
	All Companies	1,668.1	1,628.0	1,824.2	12.1	100.0

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-2
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Europe Software Companies, Mechanical, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	IBM	118.4	132.8	163.3	23.0	18.5
2	Computervision	126.8	92.3	91.4	-1.0	10.3
3	Dassault*	80.8	73.4	86.3	17.7	9.8
4	Parametric Technology	18.1	40.4	69.7	72.4	7.9
5	Matra Datavision	54.3	52.5	63.4	20.7	7.2
6	Autodesk	53.1	52.6	60.1	14.3	6.8
7	EDS Unigraphics	33.6	37.7	44.1	17.2	5.0
8	Hewlett-Packard	42.2	38.3	37.3	-2.7	4.2
9	SDRC	26.0	24.8	27.8	12.2	3.1
10	MacNeal-Schwendler	28.9	34.2	27.7	-19.1	3.1
11	Siemens Nixdorf Info systeme	30.3	25.7	24.2	-5.8	2.7
12	Intergraph	27.1	21.4	21.2	-0.9	2.4
13	Straessle Informationssysteme	22.7	14.3	15.8	10.8	1.8
14	PROCAD GmbH	4.6	4.6	14.3	211.6	1.6
15	Applicon	24.6	16.2	14.2	-12.2	1.6
16	ISD Software	13.4	12.2	13.2	8.2	1.5
17	CAD Lab	15.2	11.4	12.9	13.3	1.5
18	ASCAD	8.4	8.7	11.4	30.7	1.3
19	Wiechers Datentechnik	8.1	8.5	8.9	4.6	1.0
20	Ansys	9.1	7.8	8.5	9.1	1.0
21	Radan Computational	7.9	8.1	8.1	-0.2	0.9
22	Engineering Computer Services*	4.9	5.5	6.9	25.5	0.8
23	Sherpa Corp.	3.2	4.8	6.8	40.6	0.8
24	Tebis	10.1	6.3	6.4	1.6	0.7
25	ICEM Technologies	10.7	5.7	6.2	9.2	0.7
26	Investronica SA	6.2	6.2	6.2	-1.0	0.7
27	Han Dataport	5.4	4.4	5.5	26.3	0.6
28	Delcam International	9.5	4.8	5.5	13.0	0.6
29	Altium*	11.7	7.1	5.3	-25.3	0.6
30	Serbi	4.3	4.5	5.0	12.0	0.6
	All N.A. Companies	554.6	546.4	619.4	13.4	70.0
	All European Companies	289.7	246.2	265.0	7.7	30.0
	All Asian Companies	-	-	-	NA	-
	All Companies	844.3	792.5	884.4	11.6	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-3
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Europe Software Companies, AEC, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Autodesk	57.1	56.6	65.4	15.6	17.4
2	Nemetschek	32.5	44.7	58.1	30.1	15.5
3	Intergraph	43.4	38.2	40.8	6.6	10.9
4	IEZ	26.3	27.8	36.2	30.1	9.7
5	IBM	14.2	14.5	16.7	15.5	4.5
6	RIB/Bausoftware	5.4	10.7	15.7	46.8	4.2
7	Soft-Tech Software Technologies	10.4	11.4	13.3	16.8	3.5
8	Ziegler Informatics	2.0	2.4	8.3	244.3	2.2
9	Siemens Nixdorf Info systeme	12.9	7.6	8.3	9.1	2.2
10	Han Dataport	8.0	6.5	8.2	26.6	2.2
11	Graphisoft Group	4.2	4.8	7.8	62.7	2.1
12	CAD Centre	5.4	5.5	7.5	37.3	2.0
13	ACA Ltd.	6.1	6.5	6.5	0.5	1.7
14	Computervision	18.2	7.3	6.3	-14.3	1.7
15	Technische Computer Systeme	4.0	5.6	6.3	12.7	1.7
16	Computer Services Consultants	4.2	4.2	4.4	5.2	1.2
17	Hochtief	3.3	3.5	4.4	25.0	1.2
18	CAD Distribution	1.9	2.9	3.9	33.6	1.0
19	MOSS Systems Group	4.4	3.1	3.7	18.1	1.0
20	Complansoft CAD	2.5	3.1	3.4	10.0	0.9
21	FHECOR*	3.3	3.1	3.3	8.8	0.9
22	RoboCAD Solutions	2.9	3.0	3.2	5.6	0.8
23	Star Informatic	6.7	2.7	3.0	9.9	0.8
24	Sener Inginiera y Sistemaus	3.0	3.2	3.0	-8.1	0.8
25	Softdesk	1.4	1.7	2.8	62.2	0.7
26	ABB Industria*	0.4	2.4	2.7	11.5	0.7
27	Aspen Technology	1.3	2.8	2.7	-2.5	0.7
28	Micrografx	1.9	2.1	2.4	14.8	0.6
29	mb Programme	1.8	2.2	2.3	7.3	0.6
30	Triplan	2.1	2.2	2.3	7.9	0.6
	All N.A. Companies	153.7	137.9	149.3	8.3	39.8
	All European Companies	186.1	188.2	225.7	19.9	60.2
	All Asian Companies	-	-	-	NA	-
	All Companies	339.8	326.1	375.0	15.0	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-4
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Europe Software Companies, GIS/Mapping, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Siemens Nixdorf Info systeme	53.5	48.1	49.6	3.1	17.5
2	ESRI	23.4	35.9	48.4	34.7	17.1
3	Intergraph	35.8	38.0	41.6	9.4	14.7
4	Landmark Graphics	12.4	21.6	23.2	7.0	8.2
5	Smallworld Systems	5.8	13.8	18.7	35.9	6.6
6	Autodesk	14.6	14.5	16.6	15.0	5.9
7	Sysdeco Innovation	4.4	8.4	8.8	5.5	3.1
8	ICL	8.1	9.0	8.7	-3.1	3.1
9	Straessle Informationssysteme	2.7	6.5	7.4	13.3	2.6
10	APIC Systemes	3.2	4.0	4.9	21.7	1.7
11	UNISYS	3.2	3.5	4.7	33.1	1.6
12	Genasys II	3.9	4.4	4.6	4.9	1.6
13	RIB/Bausoftware	1.3	2.7	4.5	67.9	1.6
14	Laser-Scan	3.4	4.3	4.4	2.7	1.6
15	Star Informatic	4.1	3.8	4.3	13.6	1.5
16	SHL VISION Solutions	3.5	1.8	3.6	103.4	1.3
17	MapInfo	0.6	1.8	3.6	99.5	1.3
18	GDS	6.2	2.1	3.0	42.9	1.1
19	IBM	3.0	3.1	3.0	-2.6	1.1
20	Poppenhaeger Grips	1.9	2.6	2.7	3.3	0.9
21	Ziegler Informatics	1.7	2.0	2.7	34.0	0.9
22	PCI Remote Sensing Corp	-	1.8	2.1	16.4	0.7
23	Ground Modelling Systems	1.5	1.3	1.9	46.2	0.7
24	Enghouse Systems Ltd.	1.4	1.5	1.6	1.1	0.5
25	ERDAS	1.2	1.1	1.4	20.0	0.5
26	PAFEC	1.6	1.3	1.4	2.3	0.5
27	Dynamic Graphics	1.0	0.9	1.0	13.5	0.4
28	Clemessy Geocity	0.8	0.9	1.0	9.5	0.3
29	ABB Industria*	1.0	0.9	0.8	-17.4	0.3
30	Earth Resource Mapping	0.3	0.6	0.6	14.3	0.2
	All N.A. Companies	116.0	137.2	160.7	17.2	56.7
	All European Companies	101.4	111.5	123.0	10.3	43.3
	All Asian Companies	-	-	-	NA	-
	All Companies	217.3	248.7	283.7	14.1	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-5
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Europe Software Companies, Electronic Design Automation, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Mentor Graphics	34.2	34.7	42.0	20.9	14.9
2	Cadence	60.9	37.7	40.3	6.9	14.3
3	Synopsys	14.8	26.6	20.0	-24.8	7.1
4	Viewlogic Systems	9.9	14.3	18.7	31.2	6.7
5	Quickturn Design Systems	0.1	4.5	11.8	165.0	4.2
6	Wiechers Datentechnik	0.7	11.2	11.5	3.0	4.1
7	COMPASS Design Automation	9.2	11.6	11.3	-3.0	4.0
8	Zuken-Redac	19.4	13.4	10.3	-23.2	3.7
9	Hewlett-Packard	9.8	8.9	9.6	7.9	3.4
10	Autodesk	8.0	7.9	7.8	-1.2	2.8
11	Zycad	7.1	4.3	6.8	58.5	2.4
12	Harris EDA	5.7	6.4	6.5	2.4	2.3
13	Norlinvest Ltd.	3.9	4.8	5.8	18.8	2.0
14	Sagantec	6.7	6.1	5.6	-8.4	2.0
15	Intergraph	10.8	6.7	5.5	-17.5	2.0
16	Analogy	3.9	4.3	4.6	6.5	1.6
17	LSI Logic	3.2	3.3	3.5	6.0	1.2
18	Aucotec	3.4	4.4	3.4	-22.7	1.2
19	ALTERA	3.0	3.5	3.4	-4.0	1.2
20	Microsim	0.3	0.3	2.6	957.5	0.9
21	CAD-UL	2.5	2.6	2.5	-2.2	0.9
22	IKOS Systems	3.0	1.8	2.4	33.8	0.9
23	MacNeal-Schwendler	0.8	0.8	2.4	206.5	0.9
24	ALS Design	2.3	2.2	2.3	8.9	0.8
25	OrCAD EDA	3.8	2.0	2.3	16.7	0.8
26	XILINX	1.0	0.8	2.2	178.0	0.8
27	debis Systemhaus	1.7	1.8	1.8	1.1	0.6
28	IBM	2.5	2.0	1.7	-12.2	0.6
29	Altium*	2.5	2.0	1.7	-12.2	0.6
30	SES Inc.	1.0	1.3	1.7	28.8	0.6
	All N.A. Companies	206.6	195.1	224.2	14.9	79.8
	All European Companies	40.6	52.2	46.6	-10.7	16.6
	All Asian Companies	19.4	13.4	10.3	-23.2	3.7
	All Companies	266.6	260.6	281.1	7.8	100.0

*Company statistics contain VAR/distributor revenue not counted in total
Source: Dataquest (August 1995)

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Table A-6
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Europe Software Companies, Electronic CAE, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Mentor Graphics	21.8	22.2	25.3	14.0	12.5
2	Cadence	36.9	20.8	22.1	6.1	10.9
3	Synopsys	14.8	26.6	20.0	-24.8	9.9
4	Viewlogic Systems	9.9	14.3	18.7	31.2	9.3
5	Quickturn Design Systems	0.1	4.5	11.8	165.0	5.8
6	Wiechers Datentechnik	0.7	11.2	11.5	3.0	5.7
7	Hewlett-Packard	9.8	8.9	9.6	7.9	4.8
8	Autodesk	8.0	7.9	7.8	-1.2	3.9
9	Zycad	7.1	4.3	6.8	58.5	3.3
10	COMPASS Design Automation	5.5	7.4	6.2	-16.2	3.0
11	Analogy	3.9	4.3	4.6	6.5	2.3
12	Aucotec	3.4	4.4	3.4	-22.7	1.7
13	Intergraph	5.0	3.7	3.4	-8.8	1.7
14	ALTERA	3.0	3.5	3.4	-4.0	1.7
15	LSI Logic	2.8	3.0	3.2	6.4	1.6
16	Harris EDA	1.8	2.4	2.9	17.7	1.4
17	Microsim	0.3	0.3	2.6	957.5	1.3
18	IKOS Systems	3.0	1.8	2.4	33.8	1.2
19	MacNeal-Schwendler	0.8	0.8	2.4	206.5	1.2
20	XILINX	1.0	0.8	2.2	178.0	1.1
21	debis Systemhaus	1.7	1.8	1.8	1.1	0.9
22	ALS Design	1.3	1.4	1.8	26.7	0.9
23	SES Inc.	1.0	1.3	1.7	28.8	0.8
24	OrCAD EDA	2.7	1.3	1.6	19.1	0.8
25	ISDATA	1.8	1.6	1.6	-3.1	0.8
26	i-Logix	0.4	1.2	1.6	25.7	0.8
27	EPIC Design Technology	0.1	0	1.6	3,132.3	0.8
28	Zuken-Redac	6.6	3.9	1.5	-61.1	0.8
29	VEDA	2.0	1.5	1.3	-14.2	0.6
30	Sagantec	-	-	1.1	NA	0.6
	All N.A. Companies	146.0	146.4	168.6	15.1	83.4
	All European Companies	22.1	34.6	32.1	-7.1	15.9
	All Asian Companies	6.6	3.9	1.5	-61.1	0.8
	All Companies	174.7	185.0	202.3	9.4	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-7
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Europe Software Companies, IC Layout, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Cadence	20.5	13.7	15.2	10.7	43.9
2	Mentor Graphics	2.7	3.4	6.1	79.1	17.7
3	COMPASS Design Automation	3.6	4.3	5.1	19.8	14.8
4	Sagantec	6.7	6.1	4.5	-26.7	12.9
5	Summitt Design	1.0	0.8	0.9	3.6	2.5
6	ARCSYS	-	-	0.7	NA	2.1
7	Cascade Design Automation	0.5	0.6	0.6	3.3	1.8
8	NEOCAD	-	0.4	0.5	25.2	1.5
9	Intergraph	0.3	0.5	0.4	-19.3	1.1
10	LSI Logic	0.4	0.3	0.3	3.0	1.0
11	Tanner Research	0	0	0.1	1264.3	0.4
12	Silicon Valley Research	1.8	0.4	0.1	-85.2	0.2
	All N.A. Companies	30.8	24.4	30.1	23.1	87.1
	All European Companies	6.7	6.1	4.5	-26.7	12.9
	All Asian Companies	-	-	-	NA	-
	All Companies	37.5	30.5	34.5	13.2	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-8
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Europe Software Companies, PCB/MCM/Hybrid, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Mentor Graphics	9.6	9.1	10.6	16.1	23.9
2	Zuken-Redac	12.9	9.5	8.8	-7.5	19.8
3	Norlinvest Ltd.	3.4	4.1	4.8	19.0	10.9
4	Harris EDA	3.9	3.9	3.6	-7.1	8.2
5	Cadence	3.4	3.1	3.0	-4.0	6.8
6	CAD-UL	2.5	2.6	2.5	-2.2	5.7
7	Intergraph	5.6	2.5	1.8	-30.0	4.0
8	IBM	2.5	2.0	1.7	-12.2	3.9
9	Altium*	2.5	2.0	1.7	-12.2	3.9
10	ULTImate Technology	1.6	1.4	1.6	16.4	3.6
11	PADS Software	0.1	1.1	1.5	35.4	3.3
12	UniCAD	-	-	1.1	NA	2.4
13	OrCAD EDA	1.2	0.6	0.7	11.3	1.5
14	ALS Design	1.0	0.8	0.6	-23.7	1.3
15	Pacific Numerics	0.4	0.5	0.5	3.9	1.2
16	Accel Technologies	0.4	0.4	0.5	36.7	1.1
17	Computervision	2.8	0.9	0.3	-63.0	0.8
18	Ziegler Informatics	2.0	2.2	0.3	-84.7	0.7
19	ABB Industria*	0.4	0.2	0.2	-	0.5
20	Cooper & Chyan Technology	-	0	0.2	1,644.9	0.4
21	ICL	0.2	0.2	0.2	-21.1	0.3
22	GRAPHSOFT	-	-	0	NA	0
23	Softdesk	0	0	0	20.0	0
24	EME	1.0	0.4	-	-100.0	-
	All N.A. Companies	29.8	24.2	25.5	5.5	57.6
	All European Companies	11.8	11.5	10.0	-13.1	22.6
	All Asian Companies	12.9	9.5	8.8	-7.5	19.8
	All Companies	54.5	45.1	44.2	-2.0	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-9
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Europe Software Companies, All Applications, UNIX

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	IBM	64.6	102.0	133.2	30.6	10.7
2	Computervision	142.8	97.5	93.1	-4.5	7.5
3	Dassault*	54.7	52.3	65.2	24.8	5.3
4	Siemens Nixdorf Info systeme	91.4	58.8	63.2	7.6	5.1
5	Parametric Technology	18.1	38.6	62.7	62.5	5.1
6	Matra Datavision	53.9	52.1	62.0	19.0	5.0
7	Intergraph	98.7	76.2	55.8	-26.8	4.5
8	EDS Unigraphics	33.6	31.2	44.1	41.3	3.6
9	Hewlett-Packard	50.9	46.6	43.5	-6.8	3.5
10	Mentor Graphics	33.8	34.1	41.1	20.4	3.3
11	Cadence	59.8	37.7	40.3	6.9	3.2
12	IEZ	26.3	27.8	34.3	23.3	2.8
13	ESRI	18.9	25.7	33.6	30.8	2.7
14	SDRC	25.0	24.6	27.8	13.3	2.2
15	Nemetschek	14.9	9.4	26.2	178.9	2.1
16	Straessle Informationssysteme	25.4	20.8	23.3	11.6	1.9
17	Landmark Graphics	12.4	21.6	23.2	7.0	1.9
18	MacNeal-Schwendler	14.0	19.3	20.6	6.9	1.7
19	Synopsys	14.8	26.6	20.0	-24.8	1.6
20	Smallworld Systems	5.8	13.8	18.7	35.9	1.5
21	Applicon	24.6	16.2	13.7	-15.0	1.1
22	Han Dataport	11.5	9.2	13.7	49.3	1.1
23	PROCAD GmbH	4.6	4.6	13.6	195.3	1.1
24	ICL	11.9	12.6	12.1	-4.0	1.0
25	Quickturn Design Systems	0.1	4.5	11.8	165.0	1.0
26	COMPASS Design Automation	9.2	11.6	11.3	-3.0	0.9
27	ISD Software	9.7	10.5	11.1	5.1	0.9
28	ASCAD	8.2	8.5	10.8	27.6	0.9
29	Zuken-Redac	16.4	11.3	10.1	-10.6	0.8
30	Autodesk	8.0	7.9	9.0	14.0	0.7
	All N.A. Companies	733.7	723.7	803.0	11.0	64.7
	All European Companies	422.8	367.3	427.1	16.3	34.4
	All Asian Companies	16.4	11.3	10.1	-10.6	0.8
	All Companies	1,172.9	1,102.3	1,240.1	12.5	100.0

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-10
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Europe Software Companies, All Applications, NT/Hybrid

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Intergraph	-	1.5	24.3	1,574.3	64.0
2	Parametric Technology	-	-	7.0	NA	18.4
3	ESRI	-	-	2.2	NA	5.8
4	IEZ	-	-	1.9	NA	5.0
5	PROCAD GmbH	-	-	1.5	NA	3.9
6	Cadtronic*	-	-	0.4	NA	1.0
7	Mentor Graphics	-	-	0.3	NA	0.9
8	Rasna Corporation	-	0.2	0.2	-8.2	0.6
9	CAD Distribution	-	-	0.2	NA	0.5
10	PCI Remote Sensing Corp	-	-	0.1	NA	0.3
11	Intusoft	-	-	0.1	NA	0.3
12	EA Systems	-	-	0.1	NA	0.2
13	PADS Software	-	-	0.1	NA	0.2
14	Autometric	-	-	0	NA	0.1
15	InterHDL	-	-	0	NA	0
	All N.A. Companies	-	1.7	34.4	1,924.1	90.6
	All European Companies	-	-	3.6	NA	9.4
	All Asian Companies	-	-	-	NA	-
	All Companies	-	1.7	38.0	2,134.0	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-11
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Europe Software Companies, All Applications, Personal Computer

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Autodesk	124.7	123.7	140.9	14.0	29.5
2	Nemetschek	17.5	35.3	32.0	-9.4	6.7
3	Intergraph	18.3	25.6	29.0	13.0	6.1
4	Ziegler Informatics	14.3	15.2	16.6	9.6	3.5
5	Siemens Nixdorf Info systeme	-	12.1	14.8	22.5	3.1
6	RIB/Bausoftware	4.9	10.7	14.7	37.6	3.1
7	Wiechers Datentechnik	7.1	14.0	14.5	3.6	3.0
8	Soft-Tech Software Technologies	10.4	11.4	13.3	16.8	2.8
9	Viewlogic Systems	3.1	5.6	10.7	91.6	2.2
10	ESRI	4.3	8.5	10.4	23.1	2.2
11	CAD Distribution	6.7	7.1	8.2	14.6	1.7
12	IBM	15.8	10.8	8.1	-24.8	1.7
13	Altium*	15.8	10.8	8.1	-24.8	1.7
14	Graphisoft Group	4.6	4.9	7.9	62.7	1.7
15	Serbi	6.3	6.1	6.8	10.7	1.4
16	ACA Ltd.	5.0	5.9	6.4	9.3	1.3
17	RoboCAD Solutions	5.8	6.0	6.3	5.6	1.3
18	Investronica SA	6.2	6.2	6.2	-1.0	1.3
19	Norlinvest Ltd.	3.9	4.8	5.8	18.8	1.2
20	Tebis	10.1	6.3	5.7	-8.8	1.2
21	ABB Industria*	6.6	6.6	5.6	-14.3	1.2
22	Computervision	5.9	5.0	4.9	-1.0	1.0
23	Technische Computer Systeme	1.4	4.0	4.5	10.4	0.9
24	Engineering Computer Services*	2.3	3.0	4.5	51.2	0.9
25	Computer Services Consultants	4.2	4.2	4.4	5.2	0.9
26	Hochtief	3.3	3.5	4.4	26.8	0.9
27	CAD Lab	2.5	2.5	4.2	64.7	0.9
28	Micrografx	3.3	3.6	4.0	9.9	0.8
29	Ground Modelling Systems	2.5	2.2	3.7	65.0	0.8
30	MapInfo	0.5	1.8	3.4	95.4	0.7
	All N.A. Companies	206.1	218.8	256.7	17.3	53.7
	All European Companies	169.9	211.1	221.2	4.8	46.3
	All Asian Companies	3.1	2.1	0.2	-90.4	0
	All Companies	379.0	432.0	478.1	10.7	100.0

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table A-12
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
Top 30 Europe Software Companies, All Applications, Host/Proprietary

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	IBM	57.7	39.6	43.5	9.9	64.0
2	Dassault*	32.1	22.5	22.7	0.8	33.4
3	MacNeal-Schwendler	15.7	15.4	9.5	-38.5	14.0
4	Siemens Nixdorf Info systeme	6.7	11.7	5.0	-57.3	7.4
5	GDS	6.8	3.8	2.3	-39.2	3.4
6	ESRI	0.2	1.8	2.2	22.8	3.2
7	Exapt	3.1	2.7	2.0	-23.9	3.0
8	Ansys	1.8	1.3	0.8	-35.8	1.2
9	Aspen Technology	0.4	0.7	0.4	-40.6	0.6
10	Framasoft	0.4	0.4	0.4	-8.4	0.6
11	debis Systemhaus	0.4	0.4	0.4	-7.0	0.6
12	Mechanical Dynamics	0.2	0.3	0.3	18.0	0.5
13	Whessoe Computing Systems	0.6	0.3	0.3	-15.2	0.4
14	Computational Mechanics	1.1	0.3	0.2	-13.9	0.4
15	CIMTEK*	0.1	0.1	0.2	77.8	0.3
16	PCI Remote Sensing Corp	-	0.1	0.1	16.4	0.2
17	Analogy	0.2	0.1	0.1	-25.0	0.1
18	EA Systems	0.5	0.1	0.1	-43.8	0.1
19	NOVASOFT Systems	0	0	0.1	33.3	0.1
20	Harris EDA	0.2	0.1	0.1	-64.3	0.1
21	Cimtel	-	-	0	NA	0.1
22	Dynamic Graphics	0.2	0	0	-25.0	0
23	GRAFTEK	0	0	0	-11.1	0
24	Meta-Software	0.1	0	0	-31.6	0
25	Rasna Corporation	-	-	0	NA	0
26	Access Corp.	-	-	0	NA	0
27	Assigraph	1.1	0.2	0	-93.3	0
28	Accugraph	0	0	0	-79.5	0
29	EDS Unigraphics	-	6.4	-	-100.0	-
30	ICEM Technologies	6.4	1.7	-	-100.0	-
	All N.A. Companies	91.2	72.3	59.6	-17.6	87.6
	All European Companies	25.1	19.7	8.4	-57.1	12.4
	All Asian Companies	-	-	-	NA	-
	All Companies	116.2	91.9	68.0	-26.1	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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Table B-1
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Europe Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	3Soft	-	0.5	0.4	-10.4	0
2	ABB Industria*	6.6	6.6	5.6	-14.3	0.3
3	Abstract Hardware	1.0	1.5	0.9	-38.8	0.1
4	ACA Ltd.	6.1	6.5	6.5	0.5	0.4
5	Accel Technologies	0.4	0.5	0.6	36.7	0
6	Access Corp.	-	-	0	NA	0
7	Accugraph	0.2	0.2	0.4	90.0	0
8	ACTEL	0.3	0.4	0.9	101.4	0
9	ADRA Systems	2.7	4.0	4.4	11.5	0.2
10	ALDEC	0.3	0.2	0.3	30.2	0
11	Algor Interactive Systems	0	0.1	0.1	12.6	0
12	Alias Research	3.8	3.7	4.0	10.1	0.2
13	ALS Design	2.3	2.2	2.3	8.9	0.1
14	ALTERA	3.0	3.5	3.4	-4.0	0.2
15	Altium*	15.8	10.8	8.1	-24.8	0.4
16	American Small Business Comp.	0.3	0.4	0.5	21.0	0
17	Analogy	3.9	4.3	4.6	6.5	0.3
18	Anilam Electronics	1.6	1.8	2.0	14.6	0.1
19	Ansys	9.1	7.8	8.5	9.1	0.5
20	APIC Systemes	3.2	4.0	4.9	21.7	0.3
21	Aplein*	0.1	0.1	-	-100.0	-
22	Applicon	24.6	16.2	14.2	-12.2	0.8
23	APTIX	0.2	0.1	0.1	4.3	0
24	ARCSYS	-	-	0.7	NA	0
25	ARKTEC	0.9	1.0	1.1	17.5	0.1
26	ASCAD	8.4	8.7	11.4	30.7	0.6
27	ASHLAR	0.2	0.4	1.3	190.3	0.1
28	Aspen Technology	1.3	2.8	2.7	-2.5	0.1
29	Assigraph	2.3	2.3	2.2	-2.2	0.1
30	Aucos elektronische Gerate	0.9	0.8	-	-100.0	-
31	Aucotec	3.4	4.4	3.4	-22.7	0.2
32	Aura CAD/CAM Systems	-	0.1	-	-100.0	-
33	Auto-Trol	2.5	1.7	1.8	5.4	0.1
34	Autodesk	132.7	131.5	149.9	14.0	8.2
35	Autometric	-	-	0.2	NA	0
36	B.A.Intelligence Networks	0.5	0.8	1.2	56.7	0.1
37	BATISOFT	3.0	1.4	-	-100.0	-

(Continued)

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Europe Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
38	Boothroyd Dewhurst	0.1	0.2	0.2	18.2	0
39	CAD Centre	6.8	5.8	7.9	37.3	0.4
40	CAD Distribution	6.7	7.5	8.7	15.8	0.5
41	CAD Lab	15.2	11.4	12.9	13.3	0.7
42	CAD TECH Iberica*	0.5	0.4	-	-100.0	-
43	CAD-Capture	0.6	0.3	-	-100.0	-
44	CAD-UL	2.5	2.6	2.5	-2.2	0.1
45	Cadence	60.9	37.7	40.3	6.9	2.2
46	CADKEY	1.9	1.5	2.0	29.7	0.1
47	CADSI	0.6	0.5	0.6	12.2	0
48	Cadtronic*	1.9	2.0	0.8	-60.0	0
49	CADWORKS	0.9	0.5	0.5	-11.9	0
50	CAE-link	0.1	0.1	-	-100.0	-
51	CAMAX Manufacturing	0.7	1.6	2.0	27.1	0.1
52	CAMTEK	1.1	1.2	-	-100.0	-
53	Caroline Informatique	1.2	1.4	-	-100.0	-
54	Carrier Corporation	0.6	0.5	0.8	68.0	0
55	Cascade Design Automation	0.7	0.8	0.8	3.9	0
56	CATALPA groupe Missler	1.5	1.2	1.1	-10.3	0.1
57	Chronology	-	-	0.2	NA	0
58	Cimatron	6.0	5.6	5.0	-10.1	0.3
59	CIMLINC	2.7	3.0	3.5	17.3	0.2
60	Cimplex	0.1	0.2	0.3	13.3	0
61	CIMTEK*	4.3	4.4	4.1	-6.3	0.2
62	Cimtel	1.0	1.0	0.8	-15.4	0
63	CLARIS	1.6	0.7	-	-100.0	-
64	Clemessy Geocity	0.8	0.9	1.0	9.5	0.1
65	CNC Software	0.8	0.8	1.0	27.1	0.1
66	COMPASS Design Automation	9.2	11.6	11.3	-3.0	0.6
67	Complansoft CAD	2.5	3.1	3.4	10.0	0.2
68	Computational Mechanics	1.5	1.0	1.0	1.5	0.1
69	Computer Services Consultants	4.2	4.2	4.4	5.2	0.2
70	Computervision	150.4	102.5	98.0	-4.4	5.4
71	Concentra	1.1	2.2	2.7	24.0	0.1
72	Contec Microelectronics	-	0.1	0.1	10.0	0
73	Contract Data Research	0.6	0.3	-	-100.0	-
74	Cooper & Chyan Technology	-	0	0.2	1,644.9	0

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Europe Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
75	DAPCO	1.2	0.4	0.5	26.2	0
76	Dassault*	86.9	74.8	88.0	17.6	4.8
77	Data I/O	0.4	0.5	0.5	-	0
78	Datagraphic	1.4	1.4	-	-100.0	-
79	debis Systemhaus	3.4	3.8	3.9	3.7	0.2
80	Delcam International	9.5	4.8	5.5	13.0	0.3
81	DELTA CAD*	0.5	1.0	-	-100.0	-
82	Deneb Robotics	0.2	0.6	1.6	189.2	0.1
83	Design Acceleration	-	-	0.2	NA	0
84	DP Technology	0.2	0.2	0.3	13.5	0
85	Dynamic Graphics	1.0	0.9	1.0	13.5	0.1
86	EA Systems	0.5	0.2	0.2	-10.0	0
87	Eagle Point	0	0.1	0.4	251.3	0
88	Earth Resource Mapping	0.3	0.6	0.6	14.3	0
89	EDS Unigraphics	33.6	37.7	44.1	17.2	2.4
90	Eigner + Partner	0.3	0.4	0.5	33.3	0
91	Elstree Computing	1.2	1.1	1.2	4.5	0.1
92	EME	1.6	0.9	-	-100.0	-
93	Enghouse Systems Ltd.	1.4	1.5	1.6	1.1	0.1
94	Engineered Software	0.6	0.7	0.8	12.3	0
95	Engineering Computer Services*	4.9	5.5	6.9	25.5	0.4
96	Engineering Mechanics	0.5	0.6	0.6	8.8	0
97	EPIC Design Technology	0.1	0	1.6	3,132.3	0.1
98	ERDAS	1.3	1.2	1.4	19.7	0.1
99	ESRI	23.4	35.9	48.4	34.7	2.7
100	Evolution Computing	0.5	0.6	0.4	-32.6	0
101	Exapt	4.2	3.8	3.2	-17.4	0.2
102	Exemplar Logic	0.1	0.2	0.5	171.9	0
103	Facility Mapping Systems	0.1	0.1	0.1	-14.7	0
104	FEA	0.7	0.9	-	-100.0	-
105	FEGS	0.9	0.8	-	-100.0	-
106	FHECOR*	4.0	3.7	3.9	4.6	0.2
107	Formtek	1.6	2.4	4.4	81.4	0.2
108	Framasoft	3.8	4.0	4.4	8.4	0.2
109	Gable CAD Systems	0.6	0.7	0.4	-36.0	0
110	GDS	8.9	5.1	4.3	-16.0	0.2
111	Genasys II	3.9	4.4	4.6	4.9	0.3

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Europe Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
112	Geo/SQL Corp.	0.2	0.1	0.1	20.0	0
113	GeoGraphix	0.1	0.1	0.1	16.7	0
114	GEOMAX Intl.	0.4	0.3	0.3	12.1	0
115	Geometria GIS Systems House	0.4	0.2	0.2	-3.1	0
116	Georgia Tech Research Corp.	0.3	0.3	-	-100.0	-
117	GEOVISION Inc.	0	0	-	-100.0	-
118	Gerber Systems	3.6	2.3	2.2	-4.3	0.1
119	GRAFTEK	0.1	0.2	0.2	7.1	0
120	Graphisoft Group	4.6	4.9	7.9	62.7	0.4
121	GRAPHSOFT	-	-	0.9	NA	0.1
122	Ground Modelling Systems	2.5	2.2	3.7	65.0	0.2
123	Han Dataport	13.3	10.9	13.7	26.5	0.8
124	Harris EDA	5.7	6.4	6.5	2.4	0.4
125	Hewlett-Packard	52.0	47.2	46.9	-0.7	2.6
126	Hochtief	3.3	3.5	4.4	25.0	0.2
127	HoSoft CAD	-	1.0	1.3	25.0	0.1
128	i-Logix	0.4	1.2	1.6	25.7	0.1
129	IBM	138.1	152.4	184.8	21.3	10.1
130	ICEM Technologies	10.7	5.7	6.2	9.2	0.3
131	ICL	11.9	12.6	12.1	-4.0	0.7
132	IEZ	26.3	27.8	36.2	30.1	2.0
133	IKOS Systems	3.0	1.8	2.4	33.8	0.1
134	IMSI	0.2	0.2	0.2	-	0
135	Intergraph	117.0	104.3	109.1	4.6	6.0
136	InterHDL	-	-	0.1	NA	0
137	Intusoft	-	-	0.1	NA	0
138	Investronica SA	6.2	6.2	6.2	-1.0	0.3
139	ISD Software	14.0	12.7	13.8	8.9	0.8
140	ISDATA	1.8	1.6	1.6	-3.1	0.1
141	Isicad	15.0	7.9	1.5	-81.6	0.1
142	ISKA	1.3	1.2	1.2	0.5	0.1
143	ItalCad	12.5	5.3	-	-100.0	-
144	Kloeckner-Moeller	3.1	3.0	2.9	-2.0	0.2
145	Kockums Computer Systems	4.4	1.4	1.6	11.1	0.1
146	Kreon	0.2	0.2	-	-100.0	-
147	Lamp Software	1.5	1.7	-	-100.0	-
148	Landmark Graphics	12.4	21.6	23.2	7.0	1.3

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Europe Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
149	Laser-Scan	3.4	4.3	4.4	2.7	0.2
150	Livermore Software Tech.	0.2	0.3	0.4	48.6	0
151	Logic System Designers*	0.1	0.7	-	-100.0	-
152	LSI Logic	3.2	3.3	3.5	6.0	0.2
153	M.O.C.	3.8	4.0	2.0	-49.2	0.1
154	Macao Systems	0.6	0.6	-	-100.0	-
155	MacNeal-Schwendler	29.6	35.0	30.1	-14.0	1.7
156	MapInfo	0.6	1.8	3.6	99.5	0.2
157	MARC	3.1	3.0	3.8	23.4	0.2
158	Marcus Computer Systeme	6.8	3.1	1.6	-48.9	0.1
159	Matra Datavision	55.0	52.9	63.4	19.7	3.5
160	mb Programme	1.8	2.2	2.3	7.3	0.1
161	MCS	2.2	2.6	2.6	-1.0	0.1
162	Mechanical Dynamics	1.1	1.9	2.3	20.0	0.1
163	MEDesign	0.6	0.6	-	-100.0	-
164	Mentor Graphics	34.2	34.7	42.0	20.9	2.3
165	Meta-Software	0.6	0.6	0.9	56.8	0
166	Micrografx	3.3	3.6	4.0	9.9	0.2
167	Microsim	0.3	0.3	2.6	957.5	0.1
168	Minc Software	0.3	0	0	9.9	0
169	MOSS Systems Group	4.4	3.1	3.7	18.1	0.2
170	MOTOROLA	0.3	0.3	0.4	8.8	0
171	Mucke Software	0.4	0.5	-	-100.0	-
172	Nemetschek	32.5	44.7	58.1	30.1	3.2
173	NEOCAD	-	0.4	0.5	25.2	0
174	Norlinvest Ltd.	3.9	4.8	5.8	18.8	0.3
175	NOVASOFT Systems	0.1	0.2	0.2	33.3	0
176	Optem Engineering	-	-	0.1	NA	0
177	OrCAD EDA	3.8	2.0	2.3	16.7	0.1
178	Pacific Numerics	0.4	0.5	0.5	3.9	0
179	PADS Software	0.2	1.2	1.6	29.7	0.1
180	PAFEC	8.1	6.5	6.5	-0.8	0.4
181	Parametric Technology	18.1	40.4	69.7	72.4	3.8
182	Pathtrace Engineering Systems	1.3	1.0	1.3	30.6	0.1
183	PCI Remote Sensing Corp	-	1.8	2.1	16.4	0.1
184	Phase Three Logic	0	0	-	-100.0	-
185	Poppenhaeger Grips	1.9	2.6	2.7	3.3	0.1

(Continued)

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Europe Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
186	PROCAD GmbH	4.6	4.6	15.1	227.7	0.8
187	Quantic Laboratories	0.4	0.6	0.6	12.2	0
188	Quickturn Design Systems	0.1	4.5	11.8	165.0	0.6
189	Radan Computational	8.8	9.0	8.9	-1.0	0.5
190	Rasna Corporation	1.1	1.9	2.8	49.2	0.2
191	Rebis	1.2	2.1	1.7	-20.1	0.1
192	RIB/Bausoftware	6.7	13.4	20.2	51.0	1.1
193	RoboCAD Solutions	5.8	6.0	6.3	5.6	0.3
194	S.T.L.D. s.r.l.	0.5	0.4	-	-100.0	-
195	Sagantec	6.7	6.1	5.6	-8.4	0.3
196	SDRC	26.0	24.8	27.8	12.2	1.5
197	Sener Inginiera y Sistemaus	3.0	3.2	3.0	-8.1	0.2
198	Serbi	6.3	6.1	6.8	10.7	0.4
199	SES Inc.	1.0	1.3	1.7	28.8	0.1
200	Sherpa Corp.	3.2	4.8	6.8	40.6	0.4
201	SHL VISION Solutions	3.5	1.8	3.6	103.4	0.2
202	Siemens Nixdorf Info systeme	98.0	82.6	83.0	0.5	4.6
203	Sigma Design	0.7	0.7	0.5	-32.4	0
204	Silicon Valley Research	1.8	0.4	0.1	-85.2	0
205	Sinus Software	0.8	0.6	0.7	10.2	0
206	Smallworld Systems	5.8	13.8	18.7	35.9	1.0
207	Soft*	1.3	1.1	-	-100.0	-
208	Soft-Tech Software Technologies	10.4	11.4	13.3	16.8	0.7
209	Softdesk	1.9	2.3	3.2	42.6	0.2
210	Softronics	3.0	3.4	3.0	-9.9	0.2
211	Speed	-	0.7	0.8	7.1	0
212	SRAC	0.7	0.8	1.0	14.3	0.1
213	Star Informatic	10.8	7.4	8.1	10.2	0.4
214	Straessle Informationssysteme	25.4	20.8	23.3	11.6	1.3
215	Strategic Mapping	1.4	0.4	0.4	18.8	0
216	Summitt Design	1.1	0.8	0.9	3.6	0
217	Superdraft	1.1	1.0	1.2	12.6	0.1
218	Sweet's Electronic Publishing	0.2	0.2	0.2	12.5	0
219	Synercom	1.2	0.9	-	-100.0	-
220	Synopsys	14.8	26.6	20.0	-24.8	1.1
221	Sysdeco Innovation	4.4	8.4	8.8	5.5	0.5
222	Systems Science	0	0	0.1	80.2	0

(Continued)

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Update Table (Revenue in $M)
All Europe Software Companies, All Applications, All Operating Systems

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
223	Tanner Research	0	0	0.2	1,849.0	0
224	Tebis	10.1	6.3	6.4	1.6	0.3
225	Technische Computer Systeme	6.6	9.3	10.2	10.4	0.6
226	Teradyne	1.8	1.0	-	-100.0	-
227	Terr-Mar Resource Info Svs	0.1	0.1	0.1	-10.8	0
228	Terra Sciences	0.1	0.1	0.1	16.7	0
229	Triplan	2.5	2.6	2.7	6.6	0.1
230	ULTImate Technology	1.6	1.4	1.6	16.4	0.1
231	Understanding Systems	0	0	-	-100.0	-
232	UniCAD	-	-	1.1	NA	0.1
233	UNISYS	3.2	3.5	4.7	33.1	0.3
234	Variation Systems Analysis	-	0	0.1	100.0	0
235	VEDA	2.0	1.5	1.3	-14.2	0.1
236	Vero International Software	2.0	1.0	1.4	45.3	0.1
237	Viewlogic Systems	9.9	14.3	18.7	31.2	1.0
238	VLSI Libraries	0.1	0.2	1.0	364.0	0.1
239	Whessoe Computing Systems	3.2	3.2	3.5	9.7	0.2
240	Wiechers Datentechnik	13.2	20.7	21.5	3.8	1.2
241	WiN Technology	-	0.3	0.4	50.0	0
242	XILINX	1.0	0.8	2.2	178.0	0.1
243	Ziegler Informatics	14.3	15.2	16.6	9.6	0.9
244	Zuken-Redac	19.4	13.4	10.3	-23.2	0.6
245	Zycad	7.1	4.3	6.8	58.5	0.4
	All N.A. Companies	1,030.9	1,016.5	1,153.6	13.5	63.2
	All European Companies	617.8	598.1	660.3	10.4	36.2
	All Asian Companies	19.4	13.4	10.3	-23.2	0.6
	All Companies	1,668.1	1,628.0	1,824.2	12.1	100.0

NA = Not applicable

*Company statistics contain VAR/distributor revenue not counted in total

Source: Dataquest (August 1995)

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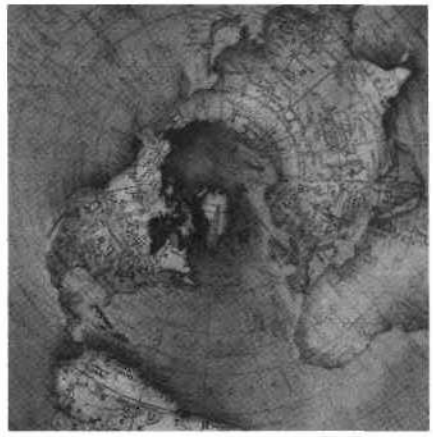
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1994 CAD/CAM/CAE/GIS Europe Market Share



Market Statistics

Program: CAD/CAM/CAE/GIS Europe
Product Code: CCAM-EU-MS-9501
Publication Date: March 27, 1995
Filing: Market Analysis

1994 CAD/CAM/CAE/GIS Europe Market Share



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Note: All tables show estimated data.

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1994 CAD/CAM/CAE/GIS Europe Market Share

Introduction

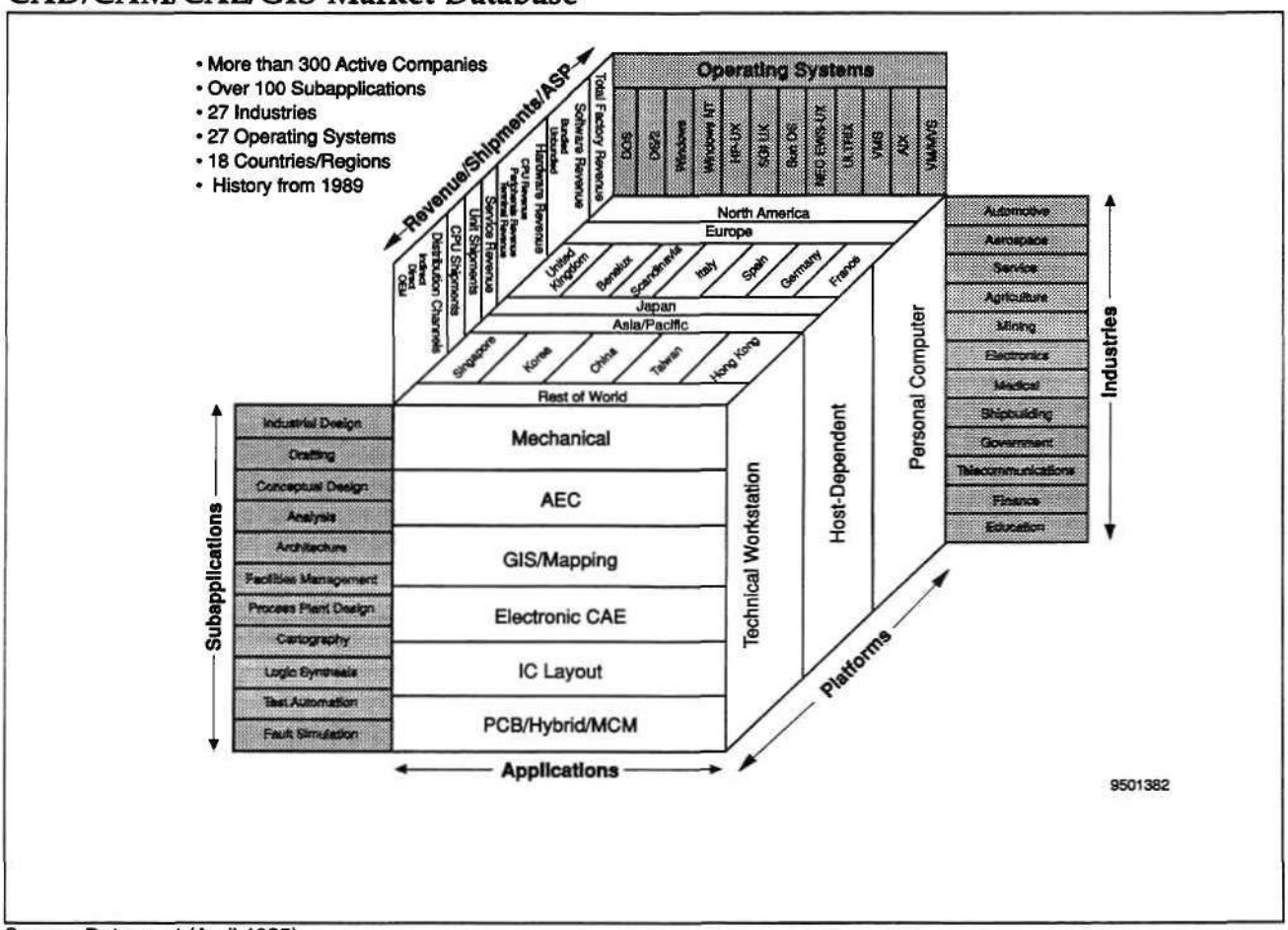
CAD/CAM/CAE/GIS systems have dramatically changed the methods by which designers and production managers originate and implement products. CAD and CAE systems allow designers to create, draft, analyze, test, and manipulate products on a screen in two and three dimensions. As CAD/CAM/CAE/GIS systems continue to decrease in cost, they become more available and cost justifiable to new users.

In order to provide a comprehensive view of the CAD/CAM/CAE/GIS industry, Dataquest's CAD/CAM/CAE/GIS group maintains a large database of industry information. The type of information contained in the database is depicted in Figure 1.

A companion article detailing the results of 1994 market share was published in our *Dataquest Alert* dated March 14, 1995.

Table 1 summarizes the performance in various segments of the CAD/CAM/CAE/GIS markets in 1994 versus 1993.

Figure 1
CAD/CAM/CAE/GIS Market Database



Source: Dataquest (April 1995)

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Table 1
CAD/CAM/CAE/GIS Market Summary, 1993 to 1994

	Software Revenue		1993-1994	Total Factory Revenue		1993-1994	Seat Shipments		1993-1994
	1993	1994	Growth (%)	1993	1994	Growth (%)	1993	1994	Growth (%)
Applications									
Mechanical	2,213.2	2,417.4	9.2	7,424.4	7,917.0	6.6	284,051	303,320	6.8
AEC	777.2	865.2	11.3	2,306.8	2,506.6	8.7	195,941	222,152	13.4
GIS/Mapping	651.9	727.1	11.5	1,982.0	2,160.9	9.0	83,384	105,919	27.0
Electronic CAE	814.2	910.4	11.8	2,302.0	2,586.8	12.4	92,437	98,000	6.0
IC Layout	204.0	240.7	18.0	630.0	741.7	17.7	10,760	12,565	16.8
PCB/MCM/Hybrid	264.3	269.5	2.0	827.3	818.8	-1.0	32,955	33,639	2.1
All Applications	4,924.8	5,430.2	10.3	15,472.5	16,731.9	8.1	699,528	775,596	10.9
Regions									
North America	1,755.7	1,973.8	12.4	5,545.6	6,219.2	12.1	313,278	353,196	12.7
Europe	1,606.3	1,738.9	8.3	5,193.5	5,460.8	5.1	226,778	243,161	7.2
Japan	1,288.0	1,398.6	8.6	4,031.8	4,258.6	5.6	133,425	144,913	8.6
Asia/Pacific	153.6	178.2	16.0	375.2	449.6	19.8	14,849	18,484	24.5
Rest of World	121.2	140.7	16.1	326.3	343.7	5.3	11,198	15,842	41.5
Worldwide	4,924.8	5,430.2	10.3	15,472.5	16,731.9	8.1	699,528	775,596	10.9
Platforms									
Technical Workstation	3,428.2	3,884.3	13.3	10,866.2	12,064.9	11.0	196,310	222,656	13.4
Host Dependent	354.1	254.0	-28.3	1,795.2	1,529.5	-14.8	35,804	39,293	9.7
Personal Computer	1,142.4	1,292.0	13.1	2,811.1	3,137.5	11.6	467,414	513,647	9.9
All Platforms	4,924.8	5,430.2	10.3	15,472.5	16,731.9	8.1	699,528	775,596	10.9

Source: Dataquest (March 1995)

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About This Document

This document contains Dataquest's detailed market share information on the CAD/CAM/CAE/GIS industry. The following list contains descriptions of the companies included in the Market Share books. See Tables 2, 3, 4, and 5 for changes from our 1993 report.

- Mechanical applications—All companies in database with mechanical revenue
- GIS and AEC applications—All companies in database with GIS revenue and all companies in database with AEC revenue. Additionally, we have added GIS data companies.
- Electronic design automation applications—All companies in database with EDA (electronic CAE, IC layout, PCB/hybrid/MCM) revenue
- Europe Overview—All companies with European revenue
- Asia—All companies with Asian revenue

We no longer publish top-level market statistics for the entire CAD/CAM/CAE/GIS industry. This data is available by calling Suzanne Snygg at (408) 437-8124. More detailed data on these markets may be requested through our client inquiry service.

We recognize that final bookeeping is not yet complete for all companies. This document represents our best effort to get early, accurate information to our subscribers. We will follow up with primary and secondary research through April 30 to verify and cross-tabulate and refine, producing our market share update by June 30.

Dataquest's policy is to continually update its market information, for current and past years, with any new data received in order to arrive at the most accurate market representation possible.

Table 2
Companies Renamed

Original Company Name	New Company Name
ACDS Graphic System	Geomax International
Genrad	VEDA
GeoVision	SHL Systemhouse
Graphisoft Software Dev	Graphisoft Group
Kohns & Poppenhaeger	Poppenhaeger Grips GmbH
Microway	M.O.C.
Scientific & Engineering Software	SES Inc.
Silvar-Lisco	SVRI (Silicon Valley Research Inc.)
Smallworld Systems	SmallworldWide
Swanson Analysis	Ansys
Tactics International	Tactician Corporation

Source: Dataquest (March 1995)

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Table 3
Companies (or CAD Portions of Companies) Sold/Merged

Company Name	Acquired by/Merged with
Aries Technology	MacNeal-Schwendler
ANACAD-EES	Mentor Graphics
Betronex & Visionics	Norlinvest Ltd.
Digital—Mechanical Software	PROCAD GmbH
Chronological Simulation	Viewlogic
Computervision—GIS	Unisys
Control Data—Mechanical Software	ICEM Technologies
Foresight Resources	Softdesk
Generation 5 Technology	Geo/SQL Corporation
Kork Systems	Autometric
LandCadd	Eagle Point
Logic Modeling Corp	Synopsys
Model Technology	Mentor Graphics
PDA Engineering	MacNeal-Schwendler
Point Control	CAMAX Manufacturing
Racal-Redac	Zuken-Redac
Sunrise	Viewlogic
Syscan	Sysdeco Innovation

Source: Dataquest (March 1995)

Table 4
Companies Deleted from Database

Region/Company	
American	European
A.I. Systems	Aplein*
Aura CAD/CAM Systems	Aucos elektronische
CAE-link	BATISOFT
Claris	CAD-Capture
Control Data—Hardware	CAD TECH Iberica*
Data General	CAMTEK
ECOM Associates	Caroline Informatique
Georgia Tech Research	Contract Data Research
GEOVISION Inc.	Data Technology/DATECH*
Innovative Data Design	Datagraphic
Intrinsix	DELTA CAD*
Land Innovation	EME
Maptech	FEA
Massteck	FEGS
MC2 Engineering Software	ItalCad
Phase Three Logic	Kreon
Synercom	Lamp Software
Teradyne	Logic Systems Designers*
Understanding Systems	Macao Systems
Asian	MEDESIGN
Kanematsu Semiconductor*	Mucke Software
	S.T.L.D.s.r.l.
	Soft*

*Distributors
Source: Dataquest (March 1995)

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Table 5
Companies Added to Database

Region/Company	
American	European
3Soft	Abstract Hardware
ArcSys	ACA Ltd.
Chronology	Speed
Claritas/NPDC	Spot Image Corp.
Design Acceleration	ULTimate Technology
Eagle Point	
EOSAT	
Equifax/NDS	
Fintronic	
Geographic Data Technology	
Integrity Engineering	
InterHDL	
Intusoft	
Nextwave DA	
OEA International	
Optem Engineering	
Simulation Technology	
Rebis (merger of EDA and ADev)	
T D Technology	
Veritools	
VISTA Environmental Inf.	

*Distributors
Source: Dataquest (March 1995)

Segmentation Definitions

This section lists the definitions specific to this document. The following paragraphs define the segments.

Applications

Mechanical

The mechanical segment refers to computer-aided tools used by engineers, designers, analysts, technicians, and draftspeople working predominantly in the discrete manufacturing industries, but includes government and education. Users of mechanical CAD/CAM/CAE tools work in all departments across the typical organization, with a majority found in product design, advanced engineering, and manufacturing engineering. Common design applications include conceptual design, industrial design, structural or thermal analysis, detail design, and electromechanical design (the mechanical part of design with electrical or electronic components and mechanisms). Common manufacturing applications include tool and fixture design, numerical control part programming, off-line robotics programming, and interface to quality control systems. Management tools for database control and distribution

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are included in this segment, as well as user-defined application programming.

Architecture, Engineering, and Construction (AEC)

The AEC segment covers the use of computer-aided tools by architects, contractors, plant engineers, civil engineers, and other people associated with these disciplines to aid in designing and managing buildings, industrial plants, ships, and other types of nondiscrete entities.

Geographic Information Systems (GIS)/Mapping

GIS is computer-based technology, and the segment is composed of hardware, software, and data used to capture, edit, display, and analyze spatial (tagged by location) information.

Electronic Design Automation (EDA)

The EDA segment covers computer-based tools used to automate the process of designing an electronic product, including printed circuit boards, ICs, and systems. EDA includes ECAE, IC layout, and PCB/hybrid/MCM, as follows:

- Electronic Computer-Aided Engineering (ECAE)—These are computer-aided tools used in the engineering or design phase of electronic products (as opposed to the physical layout phase of the product). Examples of electronic CAE applications are schematic capture and simulation.
- IC Layout—This is a software application tool used to create and validate the physical implementation of an IC. The IC layout category comprises polygon editors, symbolic editors, placement and routing (gate array, cell, and block), design verification tools (DRC/ERC/logic-to-layout).
- PCB/Hybrid/MCM—This segment covers products used to create the placement and routing of the traces and components laid out on a printed circuit board. Also included in this category are thermal analysis tools.

Regions

The following paragraphs define the regions.

North America

North America includes United States, Mexico, and Canada.

Europe

Europe includes the United Kingdom, Scandinavia, Benelux, France, Germany, Italy, Spain, and Rest of Europe.

Japan

Asia/Pacific

Asia includes Singapore, Taiwan, Korea, China, and Hong Kong.

Rest of World

Rest of World includes all other countries including Australia, New Zealand, India, Africa, Central America, South America, and the Middle East.

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Platforms

The following paragraphs define the platforms.

Technical Workstation

A technical workstation is a single-user computer distinguished from a personal computer by its features and by the user's potential range of expansion on the platform. Features include a virtual, multitasking operating system (UNIX, VMS, or Domain); the computer is designed by the manufacturer to run high-performance graphics applications in a multiuser/multitasking environment.

Host-Dependent

Host-dependent is a shared logic system in which the external workstations' functions are dependent on a host computer.

Personal Computer

A personal computer is a single-user computer distinguished from a technical workstation by its features and by the user's potential range of expansion on the platform. Features found in technical workstations (such as a virtual operating system, networking, high-performance graphics, multiuser/multitasking capability) are optional rather than integrated by the manufacturer.

Metrics

The following paragraphs define measurements.

- Total factory revenue is defined as the amount of money received by a manufacturer for its goods and services measured in U.S. dollars. Total factory revenue does not include revenue that a company may receive from products that are sold to another company for resale (OEM revenue). Total factory revenue is the sum of software revenue, hardware revenue, and service revenue.
- Unit shipment is defined as the number of seats delivered (number of possible simultaneous users of product delivered) excluding OEM shipments.
- Hardware revenue is revenue derived from sales of CPUs (including operating systems), terminals (for host-dependent systems), and peripherals.
- Software revenue is revenue derived from the sale of application software that exists on a company's standard price list.
- Service revenue is defined as all revenue derived from the service and support of CAD/CAM/CAE/GIS systems. Service revenue can be calculated in the tables by subtracting hardware and software revenue from total revenue.
  - Maintenance fees for hardware and software
  - Management and operations services—help desk, education and training, disaster recovery, vaulting, and configuration management.

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- Service bureau—project work, including construction of database, data conversion, product design, analysis, or manufacturing.
- Application development—design and development of customized software applications or the modification, enhancement of customization of existing software applications, adding new functionality.
- Consulting revenue—assessment of CAD/CAM/CAE/GIS business and information technology needs and the formulation of a plan based on needs identification.
- Implementation and integration services—planning, implementation, migration, and integration of software products (software network support and integration, account integration management, data center design, and construction).

Market Share Methodology

Dataquest uses both primary and secondary sources to produce our market share data. In the fourth quarter of each year and second quarter of the subsequent year, we survey all participants in each industry. Each vendor is offered the opportunity to self-report the information required. Although there is a primary contact for each company, large companies are surveyed across product lines and across geographic regions. Thus, there is a corresponding increase in the number of contacts at large companies. (Dataquest maintains a large contact database on all sources of information). Examples of the job titles of people contacted for information are the following:

- President and CEO
- Vice president and general manager
- Vice president of marketing
- Vice president, strategic product planning
- Director of strategic planning
- Director of marketing
- Director of market development
- Manager, CAD/CAM/CAE/GIS Marketing Programs
- Market research analyst

The Audit Process

Data supplied by vendors are evaluated against information drawn from many sources, including the following:

- Revenue published by major industry participants
- Estimates made by knowledgeable and reliable industry spokespersons
- Government data or trade association data
- Published product literature and price lists

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- Interviews with knowledgeable manufacturers, distributors, and users
- Relevant economic data
- Information and data from online data banks
- Articles in both the general and trade press
- Annual reports, SEC documents, credit reports
- Company publications and press releases
- Reports from financial analysts
- User studies
- Reseller and supplier reports and reports from a vendor's competitors

In addition, Dataquest sums vendor revenue across other industries covered by Dataquest to make sure that revenue is not credited twice and checks with multiple sources at one company to cross-check data on that company.

Dataquest analysts have many years of experience in how to apply the above tools to get the most accurate information possible on a particular company (such as what to use when and what industry averages are). We believe that the estimates presented here are the most accurate and meaningful generally available today. It is the CAD/CAM/CAE/GIS group's policy to continually update our market information for any year, based on any new data received, in order to arrive at the most accurate market representation possible.

Dataquest's CAD/CAM/CAE/GIS market numbers are often higher than those reported by other sources. We survey worldwide, which involves more vendors, higher total market revenue, lower market share per vendor, and a more accurate market picture—particularly useful when comparing regions or applications.

Publishing Schedule

We publish market share and forecasting, twice each year for each, allowing for both timely distribution of data and thorough analysis and forecasting. Our annual delivery schedule is as follows:

- Market will be published and distributed to clients by March 31.
- Forecasting from the market share tables provides a five-year forecast period, available after April 30. The books will be shipped by May 31.
- Final updated market share tables, based on additional data collection and analysis, will be completed by June 30. At this point, the market share database is frozen and will not be changed until the end of the year. For the next six months, supplementary market data will be based on this final market data. Books will be shipped by July 31.
- We provide complete final forecast tables by July 31. These tables take into consideration changes in the market share during the previous six months. Books will be shipped by September 31.

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Table A-1
1994 CAD/CAM/CAE/GIS Software Market Share Table (Revenue in $M)
Top 30 Europe Software Companies, All Applications, All Platforms

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	IBM	150.7	160.2	170.7	6.6	9.8
2	Autodesk	132.7	133.2	150.5	13.0	8.7
3	Intergraph	117.0	114.5	109.1	-4.8	6.3
4	Computervision	150.4	96.7	85.0	-12.0	4.9
5	Dassault*	86.9	80.8	84.7	4.8	4.9
6	Parametric Technology	18.1	40.4	67.2	66.2	3.9
7	Siemens Nixdorf Info systeme	90.7	65.3	65.9	0.9	3.8
8	Cadence	57.1	56.4	65.1	15.4	3.7
9	Nemetschek	32.5	44.7	58.1	30.1	3.3
10	Hewlett-Packard	52.0	47.2	48.8	3.4	2.8
11	Matra Datavision	43.5	43.6	47.1	8.2	2.7
12	ESRI	23.4	35.9	44.9	25.0	2.6
13	EDS Unigraphics	31.1	36.3	40.9	12.8	2.4
14	Mentor Graphics	39.7	43.7	40.4	-7.6	2.3
15	IEZ	26.3	27.8	36.2	30.1	2.1
16	MacNeal-Schwendler	29.6	35.0	33.9	-3.1	2.0
17	Synopsys	14.8	25.5	30.0	17.5	1.7
18	SDRC	26.0	24.8	27.8	12.1	1.6
19	Straessle Informationssysteme	25.4	20.8	22.4	7.4	1.3
20	Wiechers Datentechnik	13.2	20.7	21.5	3.8	1.2
21	RIB/Bausoftware	6.7	13.4	20.6	53.4	1.2
22	Smallworldwide	5.8	13.8	19.5	41.5	1.1
23	Landmark Graphics	10.6	17.4	18.5	6.2	1.1
24	Ziegler Informatics	14.3	15.2	16.5	8.8	0.9
25	Applicon	24.6	16.2	14.2	-12.2	0.8
26	ISD Software	14.0	13.6	14.1	3.8	0.8
27	Viewlogic Systems	9.6	13.1	14.1	7.2	0.8
28	Han Dataport	13.3	10.9	13.7	26.6	0.8
29	Soft-Tech Software Technologies	10.4	11.4	13.3	16.8	0.8
30	Zuken-Redac	19.4	13.4	13.1	-2.4	0.8
	All N.A. Companies	997.7	1,003.1	1,093.1	9.0	62.9
	All European Companies	624.2	589.6	632.6	7.3	36.4
	All Asian Companies	19.4	13.6	13.2	-2.5	0.8
	All Companies	1,641.4	1,606.3	1,738.9	8.3	100.0

* Companies contain VAR/Distributor Revenue, not counted in total

Source: Dataquest (March 1995)

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Table A-2
1994 CAD/CAM/CAE/GIS Software Market Share Table (Revenue in $M)
Top 30 Europe Software Companies, Mechanical, All Platforms

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	IBM	130.3	140.6	152.3	8.3	18.8
2	Dassault*	80.8	74.0	77.8	5.2	9.6
3	Computervision	126.8	86.5	77.3	-10.6	9.5
4	Parametric Technology	18.1	40.4	67.2	66.2	8.3
5	Autodesk	53.1	53.3	60.2	13.0	7.4
6	Matra Datavision	42.8	43.1	46.7	8.3	5.8
7	EDS Unigraphics	31.1	36.3	40.9	12.8	5.0
8	Hewlett-Packard	42.2	38.3	39.0	2.0	4.8
9	MacNeal-Schwendler	28.9	34.3	33.0	-3.8	4.1
10	SDRC	26.0	24.8	27.8	12.1	3.4
11	Intergraph	27.1	20.4	19.5	-4.2	2.4
12	Siemens Nixdorf Info systeme	27.7	16.0	16.3	1.9	2.0
13	Straessle Informationssysteme	22.7	14.3	15.4	8.0	1.9
14	Applicon	24.6	16.2	14.2	-12.2	1.7
15	ISD Software	13.4	13.0	13.5	3.1	1.7
16	CAD Lab	15.2	11.4	11.7	3.0	1.4
17	Cisigraph	11.5	11.4	11.3	-0.1	1.4
18	ASCAD/ASCAM	8.4	8.7	9.3	6.7	1.1
19	Wiechers Datentechnik	8.1	8.5	8.9	4.6	1.1
20	Ansys	9.1	7.8	8.3	6.7	1.0
21	Radan Computational	7.9	8.1	8.1	-0.2	1.0
22	Delcam International	9.5	6.4	7.0	9.3	0.9
23	Engineering Computer Services*	4.9	5.5	6.9	25.5	0.8
24	Tebis	10.1	6.3	6.4	1.6	0.8
25	ICEM Technologies	10.7	5.7	6.2	9.2	0.8
26	Investronica SA	6.2	6.2	6.2	-1.0	0.8
27	Ziegler Informatics	5.7	6.0	5.8	-4.8	0.7
28	PROCAD GmbH	4.6	4.6	5.6	22.3	0.7
29	Han Dataport	5.4	4.4	5.5	26.4	0.7
30	Serbi	4.3	4.5	5.0	12.0	0.6
	All N.A. Companies	543.5	526.5	572.6	8.8	70.6
	All European Companies	295.6	242.7	238.9	-1.6	29.4
	All Asian Companies	-	-	-	NA	-
	All Companies	839.0	769.3	811.5	5.5	100.0

* Companies contain VAR/Distributor Revenue, not counted in total

NA = Not applicable

Source: Dataquest (March 1995)

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Table A-3
1994 CAD/CAM/CAE/GIS Software Market Share Table (Revenue in $M)
Top 30 Europe Software Companies, AEC, All Platforms

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Autodesk	57.1	57.3	64.7	13.0	18.2
2	Nemetschek	32.5	44.7	58.1	30.1	16.3
3	Intergraph	43.4	42.7	40.3	-5.5	11.3
4	IEZ	26.3	27.8	36.2	30.1	10.2
5	RIB/Bausoftware	5.4	10.7	16.0	49.1	4.5
6	IBM	14.9	14.6	13.8	-5.6	3.9
7	Soft-Tech Software Technologies	10.4	11.4	13.3	16.8	3.7
8	Han Dataport	8.0	6.5	8.2	26.7	2.3
9	Graphisoft Group	4.2	4.9	8.0	64.3	2.3
10	ACA Ltd.	6.1	6.8	7.7	13.8	2.2
11	CAD Centre	5.4	5.3	7.6	44.5	2.1
12	Dassault*	6.1	6.8	6.8	0.6	1.9
13	Computervision	18.2	7.7	6.5	-14.7	1.8
14	Technische Computer Systeme	4.0	5.6	6.3	12.7	1.8
15	Moss Systems Group	4.4	2.9	5.4	89.3	1.5
16	Computer Services Consultants	4.2	4.2	4.4	5.2	1.2
17	CAD Distribution	1.9	2.9	4.3	48.1	1.2
18	Hochtief	3.3	3.5	4.3	21.9	1.2
19	Siemens Nixdorf Info systeme	11.6	4.0	4.2	4.3	1.2
20	RoboCAD Solutions	3.0	3.2	3.6	13.8	1.0
21	Isicad CAD/CAM Systeme	5.2	3.3	3.6	7.5	1.0
22	Complansoft CAD	2.5	3.1	3.4	10.0	1.0
23	FHECOR*	3.3	3.1	3.3	8.8	0.9
24	Star Informatic	6.7	2.7	3.0	9.9	0.8
25	Sener Inginiera y Sistemaus	3.0	3.2	3.0	-8.1	0.8
26	Ziegler Informatics	2.0	2.4	2.8	16.6	0.8
27	ABB Industria*	0.4	2.4	2.7	11.5	0.8
28	Aspen Technology	1.3	2.8	2.7	-2.5	0.8
29	mb Programme	1.8	2.2	2.3	7.3	0.7
30	Assigraph	2.3	2.3	2.2	-2.2	0.6
	All N.A. Companies	140.4	130.4	131.6	1.0	37.0
	All European Companies	189.7	186.8	224.2	20.1	63.0
	All Asian Companies	-	-	-	NA	-
	All Companies	330.2	317.1	355.9	12.2	100.0

* Companies contain VAR/Distributor Revenue, not counted in total
NA = Not applicable
Source: Dataquest (March 1995)

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Table A-4
1994 CAD/CAM/CAE/GIS Software Market Share Table (Revenue in $M)
Top 30 Europe Software Companies, GIS/Mapping, All Platforms

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Siemens Nixdorf Info systeme	50.3	44.8	45.0	0.3	16.8
2	ESRI	23.4	35.9	44.9	25.0	16.8
3	Intergraph	35.8	41.2	38.9	-5.4	14.6
4	Smallworldwide	5.8	13.8	19.5	41.5	7.3
5	Landmark Graphics	10.6	17.4	18.5	6.2	6.9
6	Autodesk	14.6	14.7	16.6	13.0	6.2
7	Sysdeco Innovation	4.4	8.4	8.8	5.5	3.3
8	ICL	8.1	9.0	8.7	-3.1	3.3
9	Straessle Informationssysteme	2.7	6.5	6.9	6.0	2.6
10	APIC Systemes	3.2	4.0	4.9	21.7	1.8
11	UNISYS	3.2	3.5	4.9	38.5	1.8
12	Genasys II	3.9	4.4	4.6	4.9	1.7
13	RIB/Bausoftware	1.3	2.7	4.6	70.6	1.7
14	Laser-Scan	3.4	4.3	4.4	2.6	1.7
15	Star Informatic	4.1	3.8	4.3	13.6	1.6
16	MapInfo	0.6	0.1	3.6	5850.1	1.3
17	PCI Remote Sensing Corp	-	-	3.1	NA	1.1
18	IBM	3.0	3.0	2.8	-5.8	1.0
19	Poppenhaeger Grips	1.9	2.6	2.7	3.3	1.0
20	Ziegler Informatics	1.7	2.0	2.7	33.5	1.0
21	GDS	6.2	2.1	2.4	13.7	0.9
22	SHL Vision Solutions	3.5	1.8	1.9	9.0	0.7
23	Ground Modelling Systems	1.5	1.3	1.9	46.2	0.7
24	Enghouse Systems Ltd.	1.4	1.7	1.8	11.5	0.7
25	PAFEC	1.6	1.3	1.4	2.3	0.5
26	ERDAS	1.2	1.1	1.3	14.0	0.5
27	Dynamic Graphics	1.0	0.9	1.0	13.5	0.4
28	Clemessy Geocity	0.8	0.9	1.0	9.7	0.4
29	ABB Industria*	1.0	0.9	0.8	-17.4	0.3
30	Earth Resource Mapping	0.3	0.6	0.6	14.3	0.2
	All N.A. Companies	111.9	130.7	148.1	13.3	55.4
	All European Companies	98.4	108.6	119.1	9.7	44.6
	All Asian Companies	-	-	-	NA	-
	All Companies	210.3	239.3	267.2	11.7	100.0

* Companies contain VAR/Distributor Revenue, not counted in total

NA = Not applicable

Source: Dataquest (March 1995)

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Table A-5
1994 CAD/CAM/CAE/GIS Software Market Share Table (Revenue in $M)
Top 30 Europe Software Companies, EDA, All Platforms

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Cadence	57.1	56.4	65.1	15.4	21.4
2	Mentor Graphics	39.7	43.7	40.4	-7.6	13.3
3	Synopsys	14.8	25.5	30.0	17.5	9.8
4	Viewlogic Systems	9.6	13.1	14.1	7.2	4.6
5	Zuken-Redac	19.4	13.4	13.1	-2.4	4.3
6	Wiechers Datentechnik	0.7	11.2	11.5	3.0	3.8
7	Intergraph	10.8	10.3	10.3	-0.3	3.4
8	Hewlett-Packard	9.8	8.9	9.8	9.6	3.2
9	Autodesk	8.0	8.0	9.0	13.0	3.0
10	Quickturn Design Systems	0.1	4.0	8.8	121.6	2.9
11	COMPASS Design Automation	9.2	7.7	8.2	6.0	2.7
12	Zycad	7.1	4.3	6.8	58.5	2.2
13	Harris EDA	5.7	6.4	6.5	2.4	2.1
14	Sagantec	6.7	6.1	5.9	-3.3	1.9
15	Norlinvest Ltd.	3.9	4.8	5.8	18.8	1.9
16	Ziegler Informatics	4.9	4.7	5.3	11.9	1.7
17	Analogy	3.9	4.3	4.6	6.5	1.5
18	LSI Logic	3.2	3.3	3.5	6.0	1.2
19	Aucotec	3.4	4.4	3.4	-22.7	1.1
20	Summitt Design	1.7	1.3	2.5	92.0	0.8
21	CAD-UL	2.5	2.6	2.5	-2.2	0.8
22	ALS Design	2.3	2.2	2.3	6.6	0.8
23	i-Logix	0.4	1.1	2.0	80.0	0.7
24	debis Systemhaus	1.7	1.8	1.8	1.1	0.6
25	ISDATA	1.8	1.6	1.8	8.0	0.6
26	IBM	2.5	2.0	1.7	-12.2	0.6
27	Altium*	2.5	2.0	1.7	-12.2	0.6
28	XILINX	1.0	0.8	1.7	117.5	0.6
29	EPIC Design Technology	0.1	0	1.6	3133.3	0.5
30	PADS Software	0.2	1.3	1.5	19.9	0.5
	All N.A. Companies	201.9	215.6	240.8	11.7	79.1
	All European Companies	40.5	51.5	50.3	-2.3	16.5
	All Asian Companies	19.4	13.6	13.2	-2.5	4.3
	All Companies	261.8	280.6	304.3	8.4	100.0

* Companies contain VAR/Distributor Revenue, not counted in total

Source: Dataquest (March 1995)

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Table A-6
1994 CAD/CAM/CAE/GIS Software Market Share Table (Revenue in $M)
Top 30 Europe Software Companies, ECAE, All Platforms

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Cadence	34.8	30.8	35.4	15.0	16.7
2	Synopsys	14.8	25.5	30.0	17.5	14.1
3	Mentor Graphics	25.0	24.9	26.6	7.0	12.5
4	Viewlogic Systems	9.6	13.1	14.1	7.2	6.6
5	Wiechers Datentechnik	0.7	11.2	11.5	3.0	5.4
6	Hewlett-Packard	9.8	8.9	9.8	9.6	4.6
7	Quickturn Design Systems	0.1	4.0	8.8	121.6	4.1
8	Autodesk	6.6	6.7	7.5	13.0	3.6
9	Zycad	7.1	4.3	6.8	58.5	3.2
10	Intergraph	5.0	5.8	5.8	0.1	2.7
11	Analogy	3.9	4.3	4.6	6.5	2.2
12	COMPASS Design Automation	5.5	4.2	4.6	7.8	2.2
13	Zuken-Redac	6.6	3.9	3.6	-7.1	1.7
14	Aucotec	3.4	4.4	3.4	-22.7	1.6
15	LSI Logic	2.8	3.0	3.2	6.4	1.5
16	Harris EDA	1.8	2.4	2.9	17.7	1.3
17	Ziegler Informatics	2.9	2.5	2.8	10.0	1.3
18	i-Logix	0.4	1.1	2.0	80.0	0.9
19	debis Systemhaus	1.7	1.8	1.8	1.1	0.9
20	ISDATA	1.8	1.6	1.8	8.0	0.8
21	XILINX	1.0	0.8	1.7	117.5	0.8
22	ALS Design	1.3	1.4	1.6	15.9	0.8
23	EPIC Design Technology	0.1	0	1.6	3133.3	0.7
24	SES Inc.	1.0	1.3	1.4	7.6	0.7
25	IKOS Systems	3.0	1.8	1.4	-22.0	0.7
26	VEDA	2.0	1.5	1.3	-14.2	0.6
27	VLSI Libraries	0.1	0.2	1.0	363.6	0.5
28	Kloeckner-Moeller	1.2	1.0	1.0	-2.9	0.5
29	MacNeal-Schwendler	0.8	0.8	1.0	25.4	0.5
30	Norlinvest Ltd.	0.5	0.8	0.9	17.7	0.4
	All N.A. Companies	141.6	150.1	175.9	17.2	83.0
	All European Companies	22.0	33.9	32.4	-4.4	15.3
	All Asian Companies	6.6	3.9	3.6	-7.1	1.7
	All Companies	170.1	187.9	212.0	12.8	100.0

* Companies contain VAR/Distributor Revenue, not counted in total

Source: Dataquest (March 1995)

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Table A-7
1994 CAD/CAM/CAE/GIS Software Market Share Table (Revenue in $M)
Top 30 Europe Software Companies, IC Layout, All Platforms

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Cadence	19.0	20.9	24.7	18.3	58.2
2	Sagantec	6.7	6.1	5.9	-3.3	13.9
3	Mentor Graphics	4.2	7.2	4.3	-41.2	10.0
4	COMPASS Design Automation	3.6	3.5	3.6	3.7	8.5
5	Summitt Design	-	0.8	1.6	92.8	3.9
6	Intergraph	0.3	0.7	0.7	0.2	1.7
7	Cascade Design Automation	0.5	0.6	0.6	3.3	1.5
8	LSI Logic	0.4	0.3	0.3	3.0	0.8
9	Compact Software	-	0.3	0.3	3.3	0.7
10	Silicon Valley Research	1.8	0.4	0.3	-16.8	0.7
11	Tanner Research	0	0	0	122.2	0.1
	All N.A. Companies	29.8	34.8	36.5	5.0	86.1
	All European Companies	6.7	6.1	5.9	-3.3	13.9
	All Asian Companies	-	-	-	NA	-
	All Companies	36.5	40.9	42.4	3.8	100.0

* Companies contain VAR/Distributor Revenue, not counted in total
NA = Not applicable
Source: Dataquest (March 1995)

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Table A-8
1994 CAD/CAM/CAE/GIS Software Market Share Table (Revenue in $M)
Top 30 Europe Software Companies, PCB, All Platforms

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Mentor Graphics	10.5	11.6	9.5	-17.9	19.1
2	Zuken-Redac	12.9	9.5	9.4	-0.4	18.9
3	Cadence	3.3	4.7	5.0	5.1	9.9
4	Norlinvest Ltd.	3.4	4.1	4.8	19.0	9.7
5	Intergraph	5.6	3.8	3.8	-0.9	7.6
6	Harris EDA	3.9	3.9	3.6	-7.1	7.3
7	CAD-UL	2.5	2.6	2.5	-2.2	5.0
8	Ziegler Informatics	2.0	2.2	2.5	14.1	4.9
9	IBM	2.5	2.0	1.7	-12.2	3.5
10	Altium*	2.5	2.0	1.7	-12.2	3.5
11	Autodesk	1.3	1.3	1.5	13.0	3.0
12	PADS Software	0.1	1.1	1.4	23.2	2.8
13	ULTImate Technology	1.6	1.4	1.4	0.7	2.8
14	Computervision	2.8	1.3	0.9	-34.8	1.8
15	ALS Design	1.0	0.8	0.7	-10.3	1.4
16	Pacific Numerics	0.4	0.5	0.5	3.9	1.1
17	ABB Industria*	0.4	0.2	0.2	-	0.4
18	Compact Software	0.1	0.2	0.2	6.7	0.3
19	ICL	0.2	0.2	0.2	-21.1	0.3
20	Infinite Graphics	0.1	0.1	0.2	7.1	0.3
21	Yokogawa Digital Computer	-	0.2	0.1	-12.5	0.3
22	EME	1.0	0.4	-	-100.0	-
23	MASSTECK	0	0	-	-100.0	-
	All N.A. Companies	30.6	30.7	28.3	-7.8	56.7
	All European Companies	11.8	11.5	12.0	4.5	24.1
	All Asian Companies	12.9	9.6	9.6	-0.6	19.2
	All Companies	55.2	51.8	49.9	-3.8	100.0

* Companies contain VAR/Distributor Revenue, not counted in total

Source: Dataquest (March 1995)

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Table A-9
1994 CAD/CAM/CAE/GIS Software Market Share Table (Revenue in $M)
Top 30 Europe Software Companies, All Applications, Technical Workstation

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	IBM	70.2	103.7	122.6	18.1	10.0
2	Intergraph	98.7	90.2	83.2	-7.8	6.8
3	Computervision	142.8	91.7	76.7	-16.4	6.3
4	Cadence	55.7	56.4	65.1	15.4	5.3
5	Parametric Technology	18.1	38.6	60.5	56.6	4.9
6	Dassault*	54.7	53.2	58.6	10.2	4.8
7	Siemens Nixdorf Info systeme	84.4	46.4	48.2	3.9	3.9
8	Hewlett-Packard	50.9	46.6	47.8	2.6	3.9
9	Matra Datavision	43.5	42.7	46.1	7.9	3.8
10	EDS Unigraphics	31.1	29.0	40.9	41.1	3.3
11	Mentor Graphics	39.7	43.7	39.8	-8.8	3.3
12	IEZ	26.3	27.8	34.3	23.3	2.8
13	ESRI	18.9	25.7	33.4	30.2	2.7
14	Synopsys	14.8	25.5	30.0	17.5	2.4
15	SDRC	25.0	24.6	27.8	13.2	2.3
16	Nemetschek	14.9	9.4	26.2	178.8	2.1
17	MacNeal-Schwendler	14.0	19.3	23.9	23.9	2.0
18	Straessle Informationssysteme	25.4	20.8	22.4	7.4	1.8
19	Smallworldwide	5.8	13.8	19.5	41.5	1.6
20	Landmark Graphics	10.6	17.4	18.5	6.2	1.5
21	Han Dataport	11.5	9.2	13.7	49.4	1.1
22	Applicon	24.6	16.2	13.7	-15.0	1.1
23	ICL	11.9	12.6	12.1	-4.0	1.0
24	ISD Software	9.7	11.0	11.5	4.4	0.9
25	Cisigraph	10.3	11.4	11.3	-0.1	0.9
26	Zuken-Redac	16.4	11.3	10.5	-7.1	0.9
27	Viewlogic Systems	6.5	8.2	9.2	12.8	0.8
28	ASCAD/ASCAM	8.2	8.5	9.1	7.0	0.7
29	Autodesk	8.0	8.0	9.0	13.0	0.7
30	Sysdeco Innovation	3.5	8.4	8.8	5.5	0.7
	All N.A. Companies	720.3	735.4	814.1	10.7	66.4
	All European Companies	428.0	363.5	400.7	10.2	32.7
	All Asian Companies	16.4	11.4	10.6	-7.2	0.9
	All Companies	**1,164.6**	**1,110.4**	**1,225.4**	**10.4**	100.0

* Companies contain VAR/Distributor Revenue, not counted in total

Source: Dataquest (March 1995)

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Table A-10
1994 CAD/CAM/CAE/GIS Software Market Share Table (Revenue in $M)
Top 30 Europe Software Companies, All Applications, Host Dependent

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	IBM	60.5	45.7	42.7	-6.6	63.6
2	Dassault*	32.1	27.6	26.0	-5.5	38.8
3	MacNeal-Schwendler	15.7	15.5	9.8	-36.8	14.5
4	Siemens Nixdorf Info systeme	6.3	10.4	6.0	-42.4	8.9
5	Exapt	3.1	2.7	2.0	-23.9	3.0
6	GDS	6.8	3.8	1.8	-52.7	2.7
7	ESRI	0.2	1.8	0.9	-49.9	1.3
8	Ansys	1.8	0.8	0.7	-3.9	1.1
9	Framasoft	0.4	0.4	0.4	0.7	0.7
10	Aspen Technology	0.4	0.7	0.4	-40.6	0.6
11	debis Systemhaus	0.4	0.4	0.4	-7.0	0.6
12	Mechanical Dynamics	0.2	0.4	0.4	-9.3	0.6
13	ACA Ltd.	1.1	0.6	0.4	-36.8	0.5
14	Whessoe Computing Systems	0.6	0.3	0.3	-15.2	0.4
15	Computational Mechanics	1.1	0.3	0.2	-14.3	0.4
16	SHL Vision Solutions	1.1	0.3	0.2	-22.2	0.3
17	CIMTEK*	0.1	0.1	0.2	77.8	0.3
18	EA Systems	0.5	0.2	0.1	-23.2	0.2
19	Analogy	0.2	0.1	0.1	-25.0	0.1
20	GRAFTEK	-	0.1	0.1	12.5	0.1
21	ISDATA	0.1	0.1	0.1	-40.0	0.1
22	Harris EDA	0.2	0.1	0.1	-64.3	0.1
23	Compact Software	0.2	0.1	0.1	-	0.1
24	Dynamic Graphics	0.2	0	0	-25.0	0
25	Autometric	-	-	0	NA	0
26	Meta-Software	0.1	0	0	-56.0	0
27	Assigraph	1.1	0.2	0	-93.3	0
28	Accugraph	0	0	0	-79.5	0
29	EDS Unigraphics	-	7.3	-	-100.0	-
30	ICEM Technologies	6.4	1.7	-	-100.0	-
	All N.A. Companies	94.6	77.8	57.4	-26.3	85.4
	All European Companies	24.7	18.3	9.8	-46.3	14.6
	All Asian Companies	-	-	-	NA	-
	All Companies	119.3	96.1	67.2	-30.1	100.0

* Companies contain VAR/Distributor Revenue, not counted in total

NA = Not applicable

Source: Dataquest (March 1995)

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Table A-11
1994 CAD/CAM/CAE/GIS Software Market Share Table (Revenue in $M)
Top 30 Europe Software Companies, All Applications, Personal Computer

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	Autodesk	124.7	125.2	141.5	13.0	31.7
2	Nemetschek	17.5	35.3	32.0	-9.4	7.2
3	Intergraph	18.3	24.3	25.9	6.5	5.8
4	Ziegler Informatics	14.3	15.2	16.5	8.8	3.7
5	RIB/Bausoftware	4.9	10.7	15.0	40.6	3.4
6	Wiechers Datentechnik	7.1	14.0	14.5	3.6	3.2
7	Soft-Tech Software Technologies	10.4	11.4	13.3	16.8	3.0
8	Siemens Nixdorf Info systeme	-	8.5	11.7	37.5	2.6
9	ESRI	4.3	8.5	10.6	25.0	2.4
10	CAD Distribution	6.7	7.1	9.2	29.8	2.1
11	Computervision	5.9	5.0	8.4	67.6	1.9
12	Graphisoft Group	4.6	4.9	8.0	64.3	1.8
13	ACA Ltd.	5.1	6.2	7.4	18.5	1.7
14	RoboCAD Solutions	5.9	6.2	6.9	11.2	1.5
15	Serbi	6.3	6.1	6.8	10.7	1.5
16	Parametric Technology	-	1.8	6.7	269.4	1.5
17	Investronica SA	6.2	6.2	6.2	-1.0	1.4
18	Norlinvest Ltd.	3.9	4.8	5.8	18.8	1.3
19	Tebis	10.1	6.3	5.7	-8.8	1.3
20	ABB Industria*	6.6	6.6	5.6	-14.3	1.3
21	IBM	20.0	10.8	5.4	-49.5	1.2
22	Altium*	20.0	10.8	5.4	-49.5	1.2
23	Viewlogic Systems	3.1	5.0	4.9	-2.0	1.1
24	Technische Computer Systeme	1.4	4.0	4.5	10.4	1.0
25	Engineering Computer Services*	2.3	3.0	4.5	51.2	1.0
26	Computer Services Consultants	4.2	4.2	4.4	5.2	1.0
27	Hochtief	3.3	3.5	4.3	23.6	1.0
28	Ground Modelling Systems	2.5	2.2	3.7	65.0	0.8
29	CAD Lab	2.5	2.5	3.5	39.9	0.8
30	MapInfo	0.5	-	3.4	NA	0.8
	All N.A. Companies	182.9	190.0	221.6	16.7	49.7
	All European Companies	171.5	207.8	222.1	6.9	49.8
	All Asian Companies	3.1	2.1	2.6	22.7	0.6
	All Companies	357.5	399.9	446.3	11.6	100.0

* Companies contain VAR/Distributor Revenue, not counted in total

NA = Not applicable

Source: Dataquest (March 1995)

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Table B-1
1994 CAD/CAM/CAE/GIS Software Market Share Table (Revenue in $M)
All Europe Software Companies, All Applications, All Platforms

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
1	3Soft	-	0.5	0.4	-10.4	0
2	ABB Industria*	6.6	6.6	5.6	-14.3	0.3
3	Abstract Hardware	1.0	1.5	0.9	-38.8	0.1
4	ACA Ltd.	6.1	6.8	7.7	13.8	0.4
5	Accugraph	0.2	0.2	0.4	71.2	0
6	ACTEL	0.3	0.4	0.3	-25.9	0
7	ADRA Systems	2.7	4.1	4.3	4.9	0.2
8	Algor Interactive Systems	0	0.1	0.1	9.1	0
9	Alias Research	3.8	3.7	4.0	10.1	0.2
10	ALS Design	2.3	2.2	2.3	6.6	0.1
11	Altium*	20.0	10.8	5.4	-49.5	0.3
12	Analogy	3.9	4.3	4.6	6.5	0.3
13	Anilam Electronics	1.6	1.8	2.0	14.6	0.1
14	Ansys	9.1	7.8	8.3	6.7	0.5
15	APIC Systemes	3.2	4.0	4.9	21.7	0.3
16	Aplein*	0.1	0.1	-	-100.0	-
17	Applicon	24.6	16.2	14.2	-12.2	0.8
18	APTIX	0	0	0.1	30.0	0
19	ARKTEC	0.9	-	1.1	NA	0.1
20	ASCAD/ASCAM	8.4	8.7	9.3	6.7	0.5
21	Aspen Technology	1.3	2.8	2.7	-2.5	0.2
22	Assigraph	2.3	2.3	2.2	-2.2	0.1
23	Aucos elektronische Gerate	0.9	0.8	-	-100.0	-
24	Aucotec	3.4	4.4	3.4	-22.7	0.2
25	Auto-Trol	2.5	2.5	2.6	2.8	0.1
26	Autodesk	132.7	133.2	150.5	13.0	8.7
27	Autometric	-	-	0.1	NA	0
28	BATISOFT	3.0	1.4	-	-100.0	-
29	CAD Centre	6.8	5.8	8.1	40.2	0.5
30	CAD Distribution	6.7	7.5	9.6	28.3	0.6
31	CAD Lab	15.2	11.4	11.7	3.0	0.7
32	CAD TECH Iberica*	0.5	0.4	-	-100.0	-
33	CAD-Capture	0.6	0.3	-	-100.0	-
34	CAD-UL	2.5	2.6	2.5	-2.2	0.1
35	Cadence	57.1	56.4	65.1	15.4	3.7
36	CADKEY	0.2	0.1	-	-100.0	-
37	CADSI	0.6	0.5	0.6	30.0	0
38	Cadtronic*	1.9	2.0	0.4	-78.9	0
39	CAMAX Manufacturing	0.7	0.8	2.5	220.0	0.1

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Table (Revenue in $M)
All Europe Software Companies, All Applications, All Platforms

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
40	CAMTEK	1.1	1.2	-	-100.0	-
41	Caroline Informatique	1.2	1.4	-	-100.0	-
42	Cascade Design Automation	0.7	0.8	0.8	3.9	0
43	CATALPA groupe Missler	1.5	1.2	1.1	-10.3	0.1
44	Cimatron	6.3	5.7	4.9	-13.9	0.3
45	CIMLINC	3.4	4.2	4.6	9.9	0.3
46	CIMTEK*	4.3	4.4	4.0	-7.8	0.2
47	Cisigraph	11.5	11.4	11.3	-0.1	0.7
48	Clemessy Geocity	0.8	0.9	1.0	9.7	0.1
49	Compact Software	0.6	0.5	0.5	4.4	0
50	COMPASS Design Automation	9.2	7.7	8.2	6.0	0.5
51	Complansoft CAD	2.5	3.1	3.4	10.0	0.2
52	Computational Mechanics	1.5	1.0	1.0	3.2	0.1
53	Computer Services Consultants	4.2	4.2	4.4	5.2	0.3
54	Computervision	150.4	96.7	85.0	-12.0	4.9
55	Concentra	1.1	0.7	1.3	93.4	0.1
56	Contec Microelectronics	-	0.1	0.1	-	0
57	Contract Data Research	0.6	0.3	-	-100.0	-
58	DAPCO	1.2	0.4	0.5	25.0	0
59	Dassault*	86.9	80.8	84.7	4.8	4.9
60	Data I/O	0.4	0.1	0.1	-9.1	0
61	Datagraphic	1.4	1.4	-	-100.0	-
62	debis Systemhaus	3.4	3.8	3.9	3.7	0.2
63	Delcam International	9.5	6.4	7.0	9.3	0.4
64	DELTA CAD*	0.5	1.0	-	-100.0	-
65	Design Acceleration	-	-	0.2	NA	0
66	Dynamic Graphics	1.0	0.9	1.0	13.5	0.1
67	EA Systems	0.5	0.2	0.2	-14.3	0
68	Eagle Point	0	0	0	-	0
69	Earth Resource Mapping	0.3	0.6	0.6	14.3	0
70	EDS Unigraphics	31.1	36.3	40.9	12.8	2.4
71	Elstree Computing	1.2	1.1	1.2	4.5	0.1
72	EME	1.6	0.9	-	-100.0	-
73	Enghouse Systems Ltd.	1.4	1.7	1.8	11.5	0.1
74	Engineering Computer Services*	4.9	5.5	6.9	25.5	0.4
75	Engineering Mechanics	0.5	0.6	0.6	8.8	0
76	EPIC Design Technology	0.1	0	1.6	3133.3	0.1
77	ERDAS	1.3	1.2	1.4	14.3	0.1
78	ESRI	23.4	35.9	44.9	25.0	2.6

(Continued)

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Table (Revenue in $M)
All Europe Software Companies, All Applications, All Platforms

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
79	Exapt	4.2	3.8	3.2	-17.4	0.2
80	Exemplar Logic	0.1	0.2	0.4	117.8	0
81	Facility Mapping Systems	-	0	0	-28.6	0
82	FEA	0.7	0.9	-	-100.0	-
83	FEGS	0.9	0.8	-	-100.0	-
84	FHECOR*	4.0	3.7	3.9	4.6	0.2
85	Framasoft	3.8	4.0	4.3	7.3	0.2
86	Gable CAD Systems	0.6	0.7	0.7	-	0
87	GDS	8.9	5.1	3.4	-32.4	0.2
88	Genasys II	3.9	4.4	4.6	4.9	0.3
89	Geo/SQL Corp.	-	0	0	-	0
90	GEOMAX Intl.	0.4	0.3	0.3	12.1	0
91	Geometria GIS Systems House	0.4	0.2	0.2	-3.3	0
92	Georgia Tech Research Corp.	0.3	0.3	-	-100.0	-
93	GEOVISION Inc.	0	0	-	-100.0	-
94	Gerber Systems	3.6	2.3	1.8	-21.0	0.1
95	GRAFTEK	0.6	0.6	0.6	7.1	0
96	Graphisoft Group	4.6	4.9	8.0	64.3	0.5
97	Ground Modelling Systems	2.5	2.2	3.7	65.0	0.2
98	Han Dataport	13.3	10.9	13.7	26.6	0.8
99	Harris EDA	5.7	6.4	6.5	2.4	0.4
100	Hewlett-Packard	52.0	47.2	48.8	3.4	2.8
101	Hochtief	3.3	3.5	4.3	21.9	0.2
102	i-Logix	0.4	1.1	2.0	80.0	0.1
103	IBM	150.7	160.2	170.7	6.6	9.8
104	ICEM Technologies	10.7	5.7	6.2	9.2	0.4
105	ICL	11.9	12.6	12.1	-4.0	0.7
106	IEZ	26.3	27.8	36.2	30.1	2.1
107	IKOS Systems	3.0	1.8	1.4	-22.0	0.1
108	Infinite Graphics	0.1	0.2	0.2	5.0	0
109	Intergraph	117.0	114.5	109.1	-4.8	6.3
110	Intusoft	-	-	0.1	NA	0
111	Investronica SA	6.2	6.2	6.2	-1.0	0.4
112	ISD Software	14.0	13.6	14.1	3.8	0.8
113	ISDATA	1.8	1.6	1.8	8.0	0.1
114	Isicad CAD/CAM Systeme	15.0	7.9	3.6	-54.8	0.2
115	ISKA	1.3	1.2	1.2	0.5	0.1
116	ItalCad	12.5	5.3	-	-100.0	-
117	Kloeckner-Moeller	3.1	3.0	2.9	-2.0	0.2

(Continued)

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Table (Revenue in $M)
All Europe Software Companies, All Applications, All Platforms

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
118	Kockums Computer Systems	4.4	1.4	1.6	11.1	0.1
119	Kreon	0.2	0.2	-	-100.0	-
120	Lamp Software	1.5	1.7	-	-100.0	-
121	Landmark Graphics	10.6	17.4	18.5	6.2	1.1
122	Laser-Scan	3.4	4.3	4.4	2.6	0.3
123	Logic System Designers*	0.1	0.7	-	-100.0	-
124	LSI Logic	3.2	3.3	3.5	6.0	0.2
125	M.O.C.	3.8	4.0	2.0	-49.2	0.1
126	Macao Systems	0.6	0.6	-	-100.0	-
127	MacNeal-Schwendler	29.6	35.0	33.9	-3.1	2.0
128	MapInfo	0.6	0.1	3.6	5850.1	0.2
129	MARC	3.1	3.0	3.7	20.3	0.2
130	Marcus Computer Systeme	6.8	3.1	1.6	-48.9	0.1
131	MASSTECK	0	0	-	-100.0	-
132	Matra Datavision	43.5	43.6	47.1	8.2	2.7
133	mb Programme	1.8	2.2	2.3	7.3	0.1
134	MCS	2.2	2.1	2.5	19.4	0.1
135	Mechanical Dynamics	1.1	1.9	2.0	5.8	0.1
136	MEDesign	0.6	0.6	-	-100.0	-
137	Mentor Graphics	39.7	43.7	40.4	-7.6	2.3
138	Meta-Software	0.5	0.6	0.6	9.0	0
139	Microsim	0.3	0.3	0.4	48.1	0
140	Minc Software	0.3	0	0	9.9	0
141	Moss Systems Group	4.4	2.9	5.4	89.3	0.3
142	MOTOROLA	0.3	0.3	0.4	8.8	0
143	Mucke Software	0.4	0.5	-	-100.0	-
144	Nemetschek	32.5	44.7	58.1	30.1	3.3
145	NEOCAD	-	0.5	0.5	8.0	0
146	Norlinvest Ltd.	3.9	4.8	5.8	18.8	0.3
147	Optem Engineering	-	-	0.1	NA	0
148	Pacific Numerics	0.4	0.5	0.5	3.9	0
149	PADS Software	0.2	1.3	1.5	19.9	0.1
150	PAFEC	8.1	6.5	6.5	-0.8	0.4
151	Parametric Technology	18.1	40.4	67.2	66.2	3.9
152	Pathtrace Engineering Systems	1.3	1.0	1.3	30.6	0.1
153	PCI Remote Sensing Corp	-	-	3.1	NA	0.2
154	Phase Three Logic	0	0	-	-100.0	-
155	Poppenhaeger Grips	1.9	2.6	2.7	3.3	0.2
156	PROCAD GmbH	4.6	4.6	5.6	22.3	0.3

(Continued)

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Table (Revenue in $M)
All Europe Software Companies, All Applications, All Platforms

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
157	Quantic Laboratories	0.4	0.6	0.6	8.2	0
158	Quickturn Design Systems	0.1	4.0	8.8	121.6	0.5
159	Radan Computational	8.8	9.0	8.9	-1.0	0.5
160	Rasna Corporation	1.1	1.5	2.3	53.3	0.1
161	Rebis	-	-	0.2	NA	0
162	RIB/Bausoftware	6.7	13.4	20.6	53.4	1.2
163	RoboCAD Solutions	5.9	6.2	6.9	11.2	0.4
164	S.T.L.D. s.r.l.	0.5	0.4	-	-100.0	-
165	Sagantec	6.7	6.1	5.9	-3.3	0.3
166	SDRC	26.0	24.8	27.8	12.1	1.6
167	Sener Inginiera y Sistemaus	3.0	3.2	3.0	-8.1	0.2
168	Serbi	6.3	6.1	6.8	10.7	0.4
169	SES Inc.	1.0	1.3	1.4	7.6	0.1
170	SHL Vision Solutions	3.5	1.8	1.9	9.0	0.1
171	Siemens Nixdorf Info systeme	90.7	65.3	65.9	0.9	3.8
172	Sigma Design	0.7	0.7	0.8	9.6	0
173	Silicon Valley Research	1.8	0.4	0.3	-16.8	0
174	Sinus Software	0.8	0.6	0.7	10.2	0
175	Smallworldwide	5.8	13.8	19.5	41.5	1.1
176	Soft*	1.3	1.1	-	-100.0	-
177	Soft-Tech Software Technologies	10.4	11.4	13.3	16.8	0.8
178	Softdesk	0	0.1	0.1	84.3	0
179	Softronics	3.0	3.4	3.0	-9.9	0.2
180	Speed	-	0.7	0.8	7.1	0
181	Star Informatic	10.8	7.4	8.1	10.2	0.5
182	Straessle Informationssysteme	25.4	20.8	22.4	7.4	1.3
183	Strategic Mapping	-	0.4	0.4	18.8	0
184	Summitt Design	1.7	1.3	2.5	92.0	0.1
185	Sunrise Test Systems	0.1	0.2	-	-100.0	-
186	Superdraft	1.1	1.0	1.2	12.6	0.1
187	Synercom	1.2	0.9	-	-100.0	-
188	Synopsys	14.8	25.5	30.0	17.5	1.7
189	Sysdeco Innovation	4.4	8.4	8.8	5.5	0.5
190	Systems Science	0	0	0.1	80.0	0
191	Tanner Research	0	0	0	217.5	0
192	Tebis	10.1	6.3	6.4	1.6	0.4
193	Technische Computer Systeme	6.6	9.3	10.2	10.4	0.6
194	TERADYNE	1.8	1.0	-	-100.0	-
195	Terr-Mar Resource Info Svs	0.1	0.1	0.1	7.7	0

(Continued)

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Table B-1 (Continued)
1994 CAD/CAM/CAE/GIS Software Market Share Table (Revenue in $M)
All Europe Software Companies, All Applications, All Platforms

Rank	Company Name	1992	1993	1994	1993-94 Growth (%)	1994 Share of Market (%)
196	Terra Sciences	0.1	0.1	0.1	16.7	0
197	Triplan	2.1	2.2	2.3	7.9	0.1
198	ULTImate Technology	1.6	1.4	1.4	0.7	0.1
199	UNISYS	3.2	3.5	4.9	38.5	0.3
200	VEDA	2.0	1.5	1.3	-14.2	0.1
201	Vero International Software	2.0	1.0	1.4	45.4	0.1
202	Viewlogic Systems	9.6	13.1	14.1	7.2	0.8
203	VLSI Libraries	0.1	0.2	1.0	363.6	0.1
204	Whessoe Computing Systems	3.2	3.2	3.5	9.7	0.2
205	Wiechers Datentechnik	13.2	20.7	21.5	3.8	1.2
206	XILINX	1.0	0.8	1.7	117.5	0.1
207	Yokogawa Digital Computer	-	0.2	0.1	-12.5	0
208	Ziegler Informatics	14.3	15.2	16.5	8.8	0.9
209	Zuken-Redac	19.4	13.4	13.1	-2.4	0.8
210	Zycad	7.1	4.3	6.8	58.5	0.4
	All N.A. Companies	997.7	1,003.1	1,093.1	9.0	62.9
	All European Companies	624.2	589.6	632.6	7.3	36.4
	All Asian Companies	19.4	13.6	13.2	-2.5	0.8
	All Companies	1,641.4	1,606.3	1,738.9	8.3	100.0

* Companies contain VAR/Distributor Revenue, not counted in total
NA = Not applicable
Source: Dataquest (March 1995)

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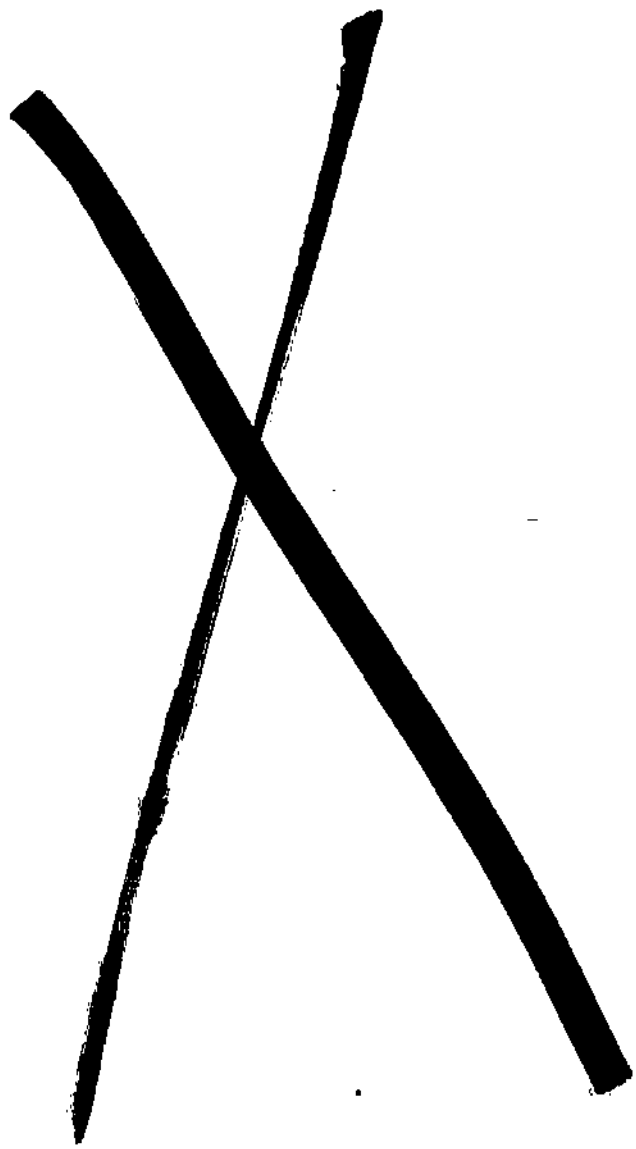
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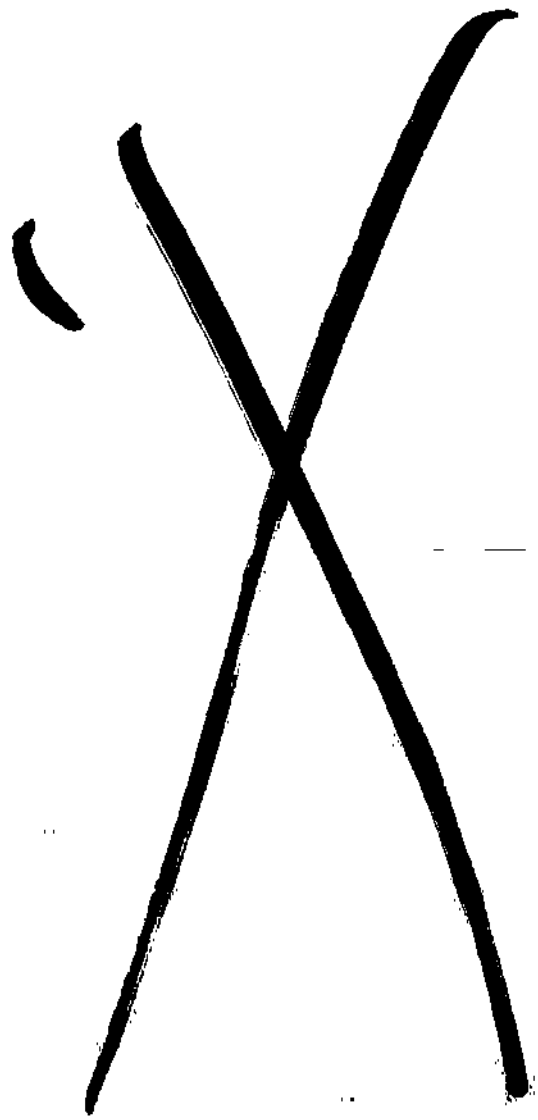
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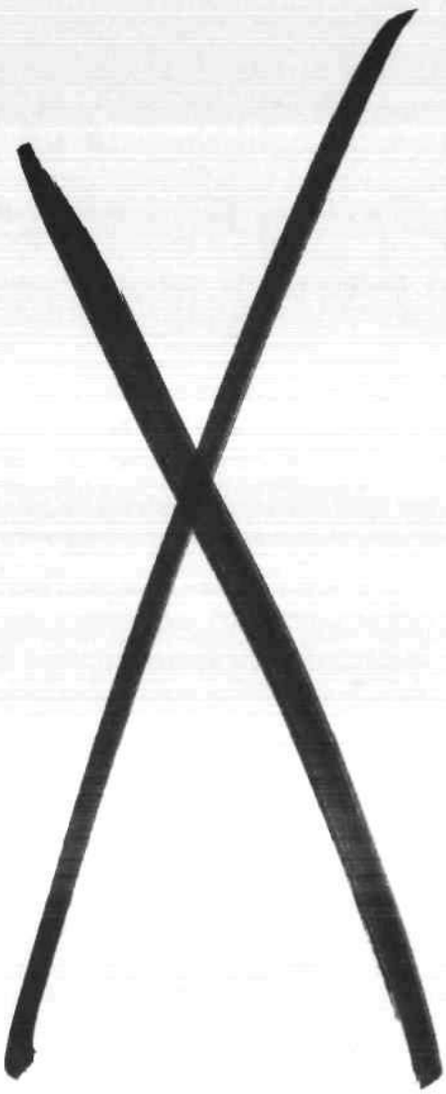
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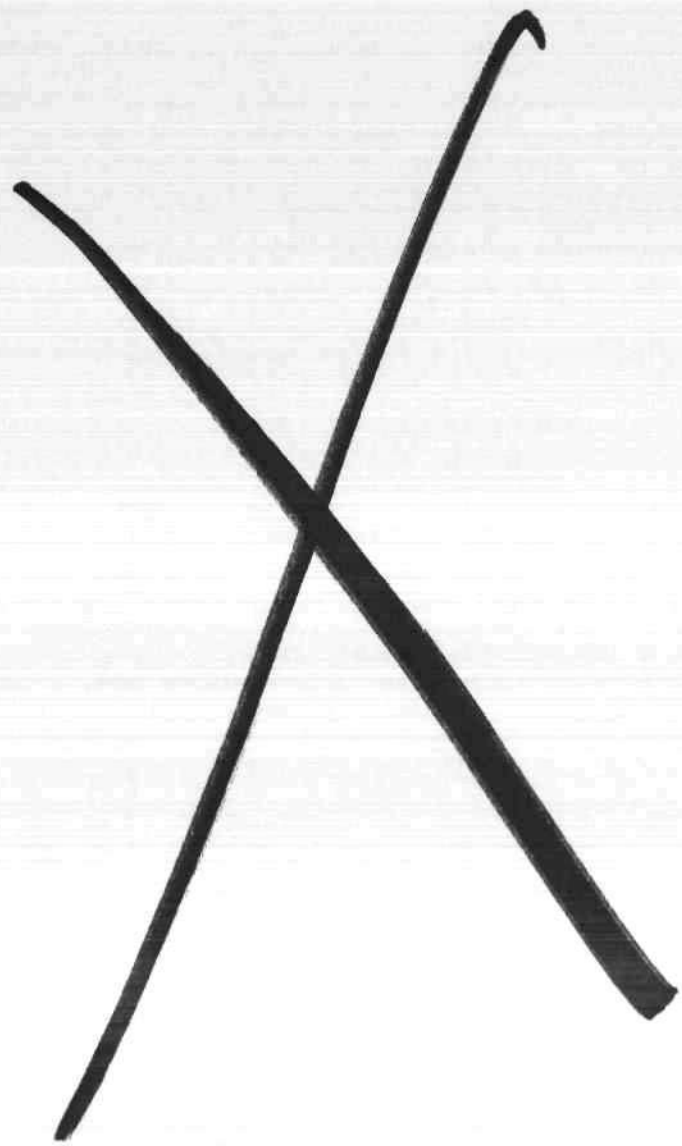
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User and Distribution Studies





CAD/CAM/CAE/GIS Europe

End-User Analysis

The European GIS Users: A Very Unhappy Lot

Abstract: *Dataquest conducted an in-depth survey of European GIS end users during the second and third quarters of 1995 to better understand the issues of this end-user environment. This document highlights some of the study's findings, identifying the best opportunities for GIS vendors and users. More detailed findings will be discussed in a forthcoming full Dataquest report.*

By Petra Gartzen and Kathryn Hale

Key Findings

The initial findings of the survey include:

- Standards are key to successful implementation of a GIS. Companies that used the standards defined by the mapping agencies were the ones that showed the best progress on GIS.
- Users believe that the three most important considerations in choosing a GIS vendor are:
  - Product features and functions
  - Reliable, bug-free software
  - Database and modeling capability
- Overall users' satisfaction on these three most important indicators falls considerably short of customer desire.
- The issue of unreliable, buggy software represents a key area requiring attention; the gap between what users want and what they are getting is largest on this indicator.

Dataquest

Program: CAD/CAM/CAE/GIS Europe
Product Code: CCAM-EU-UA-9501
Publication Date: September 25, 1995
Filing: User and Distribution Studies

Methodology

Dataquest developed a survey that was mailed directly by Dataquest to the GIS vendors and by GeoInformation International this summer.

Respondent Profiles

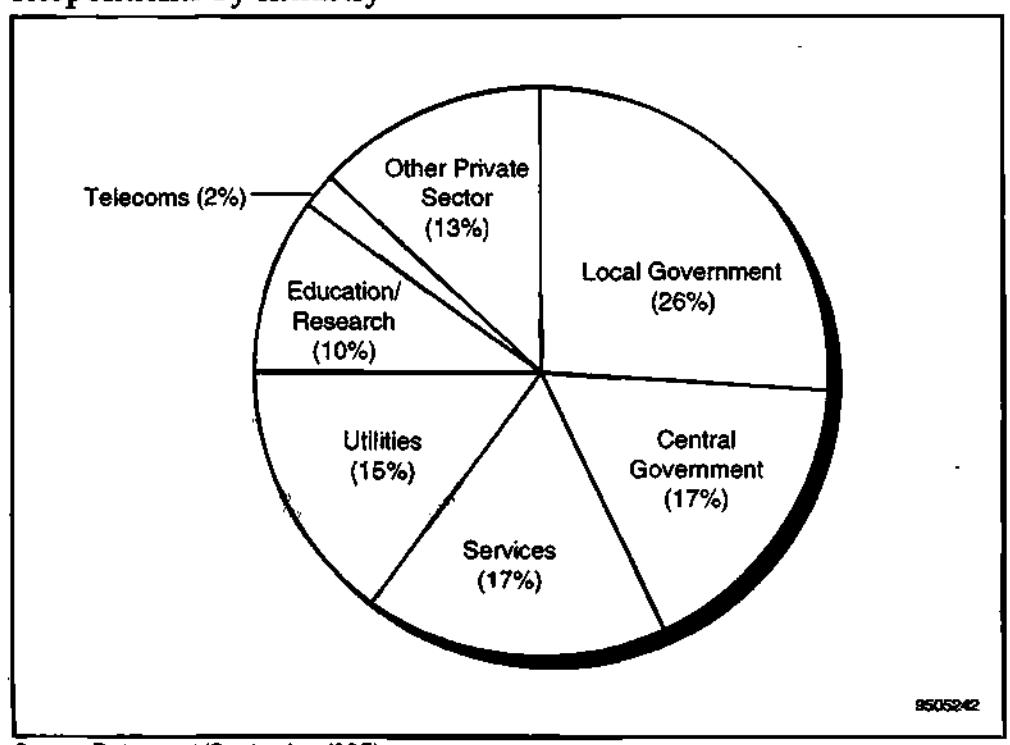
Figure 1 shows that 43 percent of the 924 respondents came from government and 17 percent from utilities and telcommunications. Both sectors represent bastions of traditional GIS and AM/FM development. Table 1 outlines the respondents by industry. Respondents reflect the typical installed base of each product. ARC/INFO enjoys a strong installed base in the government sector; FRAMME's and Smallworld's stronghold lies in utilities. The SICAD line is evenly distributed among government and utilities, while MicroStation dominates the services installations.

Germany and the United Kingdom lead the pack by far (see Figure 2). The strong bias toward U.K. users was partly generated by GeoInformation's mailing list of Mapping Awareness readers.

Standards Breed Success

Respondents use a variety of standards, and many organizations had multiple standards. In Figure 3 we compare their success with GIS (based on the statement "my organization's progress with GIS has been excellent") with their responses to standards used. The least successful group is organizations that have no standards, or cannot name them. Naming a specific vendor as the source of standard brought more success, and the highest level of success was earned by sites that mentioned specific national mapping standards. That is, the more specific the respondents were in terms of

Figure 1
Respondents by Industry



Source: Dataquest (September 1995)

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Table 1
Respondents' Primary Business, by Product Used (Percentage)

	Total Sample (N = 883)	ESRI ARC/Info. (N = 189)	ARCCAD/ ARCView PC-ARC/Info. N = (90)	Inter-graph MGE (N = 80)	Micro-Station (N = 55)	Intergraph FRAMME (N = 22)	SNI-SICAD (N = 72)	MapInfo (N = 34)	AutoCAD (N = 31)	Small-world GIS (N = 28)	Sysdeco GIS (N = 23)	STAR CARTO (N = 19)	APIC (N = 17)	Others (N = 222)
Government (Central)	16	22	38	25	20	0	24	35	23	14	65	63	47	22
Government (Local)	26	25	10	28	4	0	26	9	3	14	4	0	0	15
Total Utilities	18	4	12	13	24	77	28	6	29	50	17	5	35	17
Services (Consulting/ Design/Service Bureau)	17	15	14	13	33	14	19	18	26	11	0	11	12	19
Education/Research	11	19	20	9	7	5	3	0	10	0	4	0	6	10
Transportation	2	1	2	3	4	0	0	3	3	0	4	5	0	3
Chemical/Petroleum	2	1	1	4	0	5	0	6	3	0	0	0	0	2
Map Publisher	1	3	0	1	2	0	0	0	3	0	4	0	0	1
Mining	1	2	0	4	0	0	0	0	0	0	0	0	0	1
Forestry	1	2	0	0	0	0	0	0	0	0	0	11	0	1
Other Private Sector	5	6	2	3	7	0	0	24	0	11	0	5	0	6

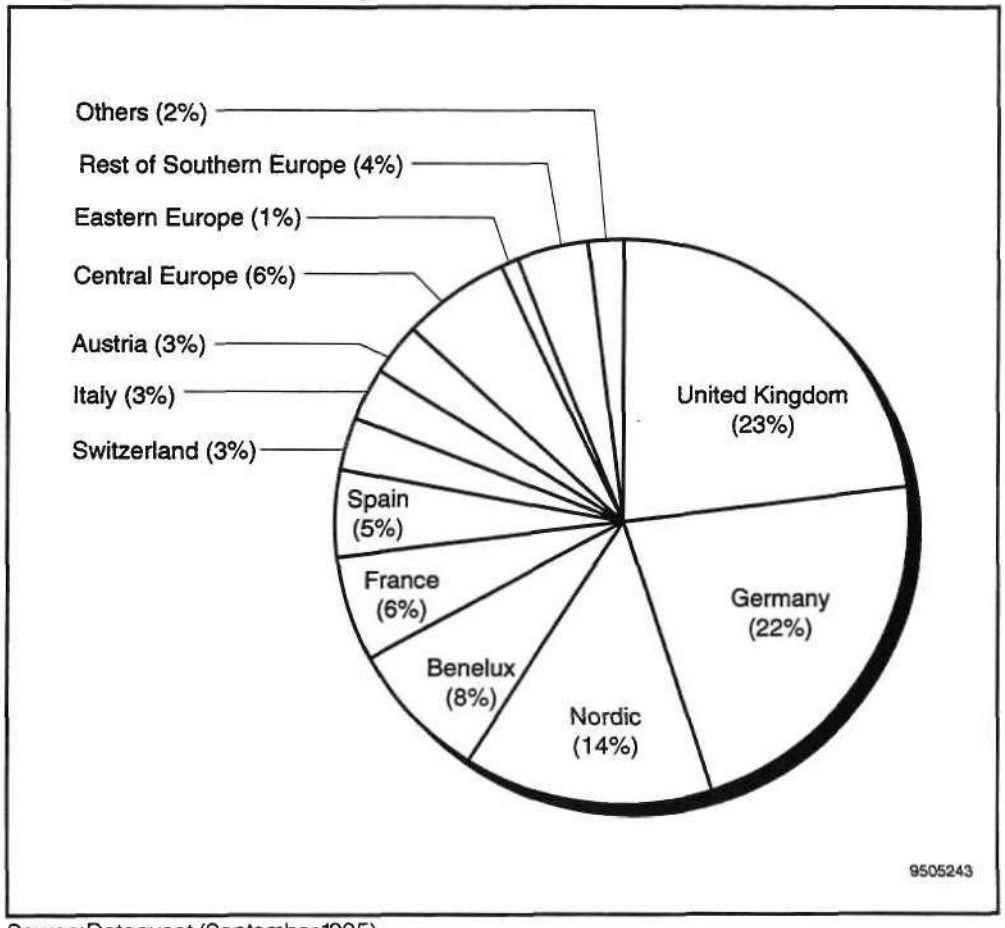
Source: Dataquest (September 1995)

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Figure 2
Respondents by Country



Source: Dataquest (September 1995)

standards, the more successful they were (sites mentioning national mapping standards could also include mentions of DXF, among others). Thus we conclude that "standards breed success."

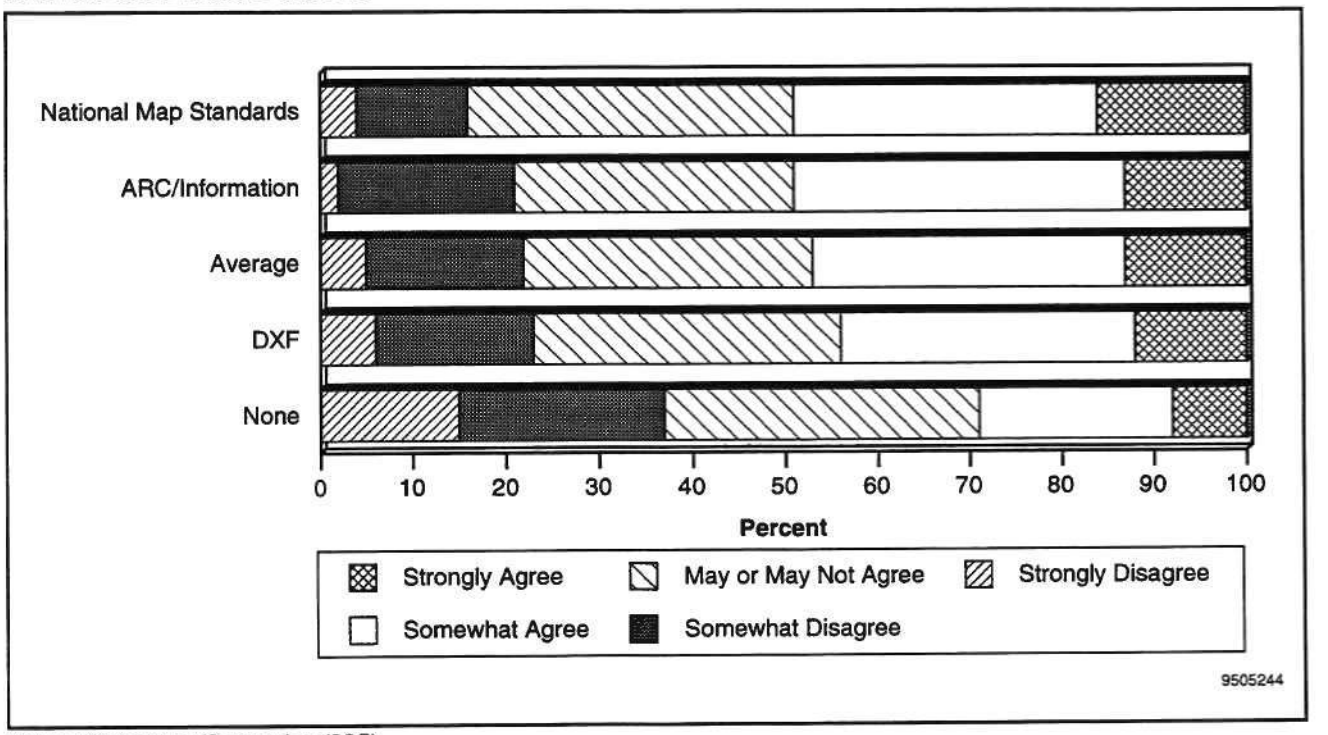
Poor Maintenance

Maintenance is rarely interesting; most of us would rather create than clean up. However, no user or vendor can afford to overlook the fact that successful sites have a working data maintenance program, and troubled sites do not. We suspect many systems have been sold with scant attention paid to early implementation of a maintenance program. The high ranking of maintenance in Figure 4 is a clear mandate to any site in trouble to allocate a higher portion of investment in maintenance.

We also found that users tend to blame the GIS software for the lack of success with GIS. Troubled sites were much more likely to replace their existing GIS software than successful sites (see Figure 5). Rather than address organizational problems that are typically at the root of failure, users are going for the easier option of trying to solve the problem with new software.

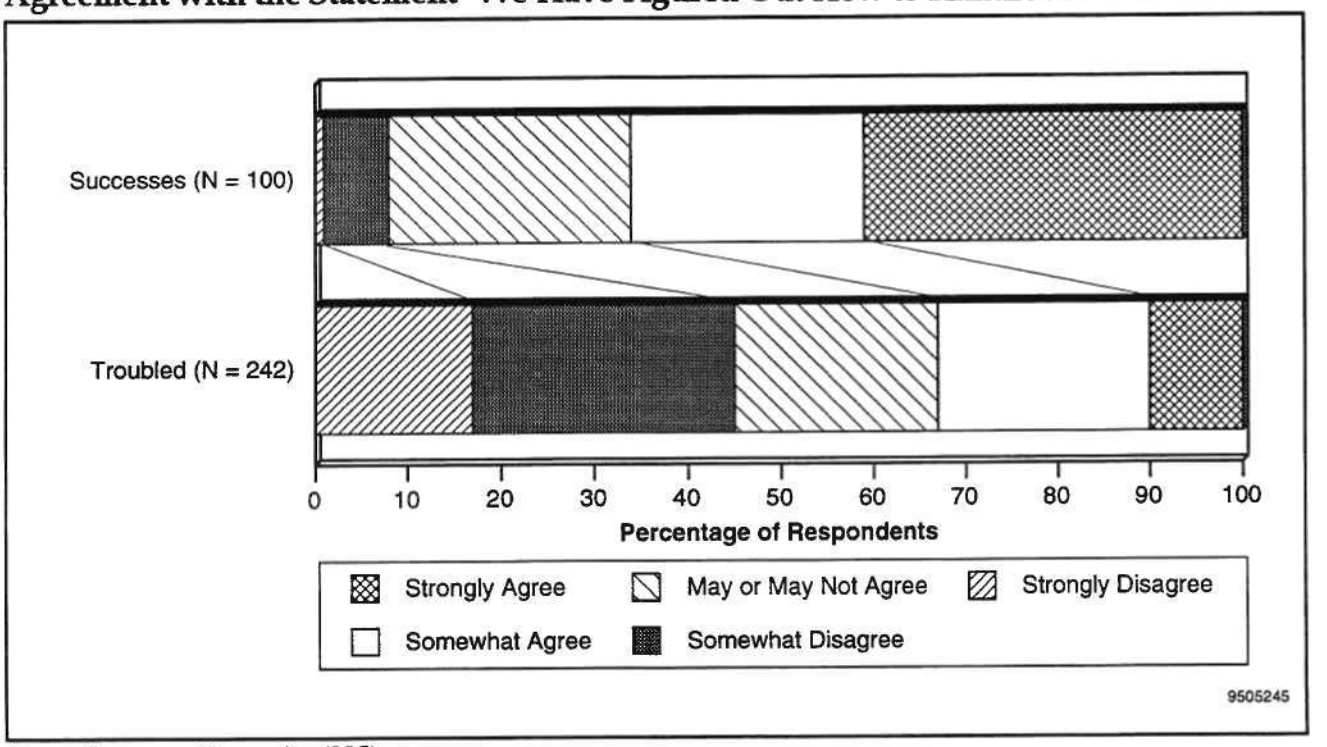
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Figure 3
Standards Breed Success



Source: Dataquest (September 1995)

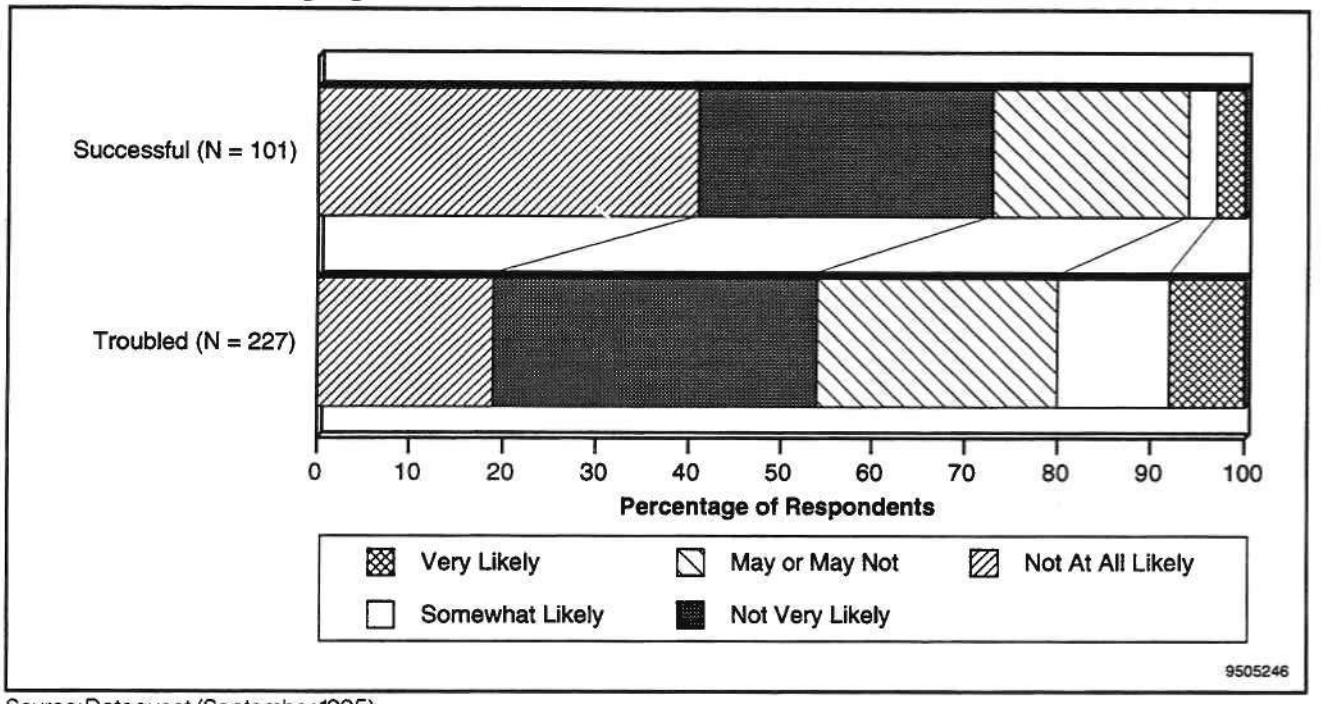
Figure 4
Agreement with the Statement "We Have Figured Out How to Handle Maintenance"



Source: Dataquest (September 1995)

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Figure 5
Likelihood of Changing Vendor



Source: Dataquest (September 1995)

Customer Satisfaction

We asked users to rate their satisfaction with their GIS in 14 key areas of product features and vendor services, and to rate the importance they place on those key indicators, using a five-point scale. Results are listed in Table 2; this same data is illustrated in Figure 6.

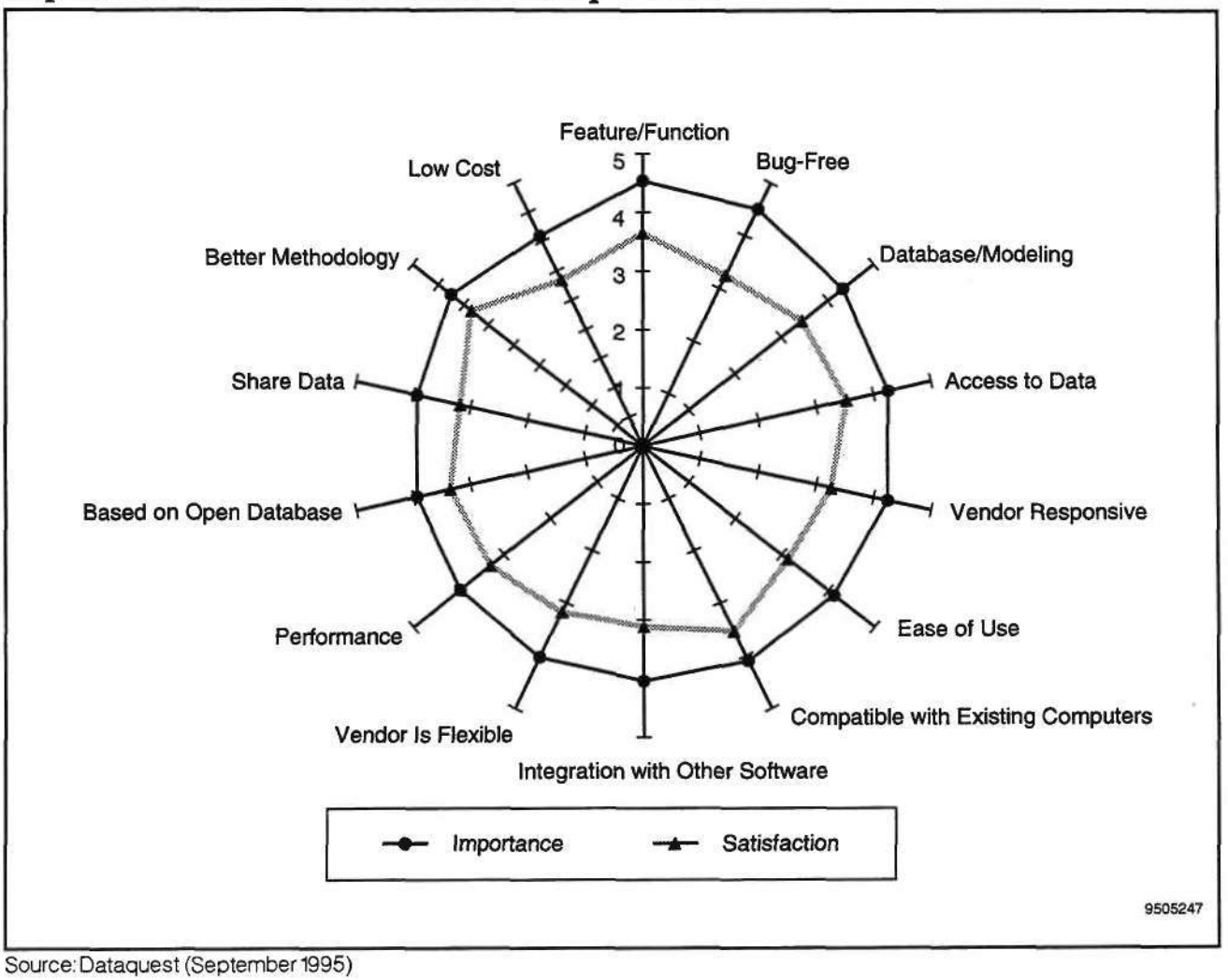
Table 2
Importance/Satisfaction Gap Analysis (Mean Responses)

	Importance	Satisfaction	Gap
Product Features and Functions	4.54	3.65	-0.89
Reliable, Bug-Free Software	4.50	3.25	-1.25
Database and Modeling Capability	4.33	3.44	-0.89
Provides Access to the Data We Want to Use	4.25	3.53	-0.72
Vendor Is Responsive to Our Needs	4.24	3.26	-0.98
Product Is Easy to Learn and Use	4.12	3.13	-0.99
Compatibility with Existing Computers	4.10	3.54	-0.56
Integration with Other Software	4.04	3.11	-0.93
Vendor Is Flexible	4.03	3.18	-0.85
Product Performance in a Demanding Environment	3.98	3.30	-0.68
Product Based on Open, Nonproprietary Database	3.94	3.36	-0.58
Share Data Created for Different Purposes or Built on Different Systems	3.94	3.19	-0.75
Vendor Offers Better Methodology and Expertise	3.75	3.35	-0.40
Low Cost	3.59	2.84	-0.75

Notes:
1. A negative gap number indicates a satisfaction deficit.
2. Ratings based on 5-point scale: 1= not at all satisfied or important, 5=extremely satisfied/important
Source: Dataquest (September 1995)

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Figure 6
Importance versus Satisfaction for All Respondents



Source: Dataquest (September 1995)

All users value product features and functions most highly (with an average importance of 4.54), followed by bug-free software. Users are not getting everything they want in product features (with an average satisfaction of 3.65, and an average gap of 0.89) and software quality, which showed by far the biggest gap with 1.25.

Unfortunately, overall user satisfaction in the three most important variables – product features and functions, bug-free software, and database modeling – fall short of customer desire. Combined with the low satisfaction scores of "vendor responsiveness" and "ease of use and learning," these results offer vendors plenty to work on. European GIS users appear much less satisfied than users in North America that we previously polled.

Recommendations

Dataquest's recommendations are as follows:

- Users should not try to build a GIS without also building a data maintenance program and data standards.

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- Key features and services that matter to experienced users have been identified. New users can use these indicators to develop their guidelines for purchase; vendors can use them to make informed decisions regarding where to enhance their offerings.
- Vendors should focus product enhancements on the important indicators where customers place high value and satisfaction falls short: product features and functions, software quality, and database and modeling capabilities.

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