THE EUROPEAN PERSONAL COMPUTER MARKET

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CHAPTER 1: PURPOSE

The European personal computer market is growing, and by 1992 the European community market will have dropped its trade barriers that inhibit free trade and the sale of goods among countries. This means that computer companies that want to sell personal computers must be established in Europe with a distribution network in order to be competitive when the market is deregulated.

Digital has signed a U.S. marketing agreement with Tandy for a line of personal computers, and now needs to be able to determine whether Tandy products can be sold in the European market.

This report gives an overview of the European PC market, with company market share by country and overall, a breakdown by processor size in all of Europe, and an overview of the top five (excluding IBM) companiess European distribution strategy.

The five companies are:

Amstrad
Apple Computer
Compaq Computer Company
Hewlett-Packard
Olivetti

CHAPTER 2: METHODOLOGY

The industry literature was searched manually and on-line, and pertinent articles and market research reports were read.

Interviews were also completed with analysts in the following market research firms:

Future Computing
Gartner Group
Inteco
Intelligent Electronics Europe (Dataquest)
International Data Corp.

CHAPTER 3: EUROPEAN PC COMPUTER MARKET

There will be a major change in the European market in the near future. It is currently a fragmented market of 12 separate countries averaging about 25 million people each, separated by frontiers and frontier controls, different rules and regulations, different standards, nationalistic public purchase policies, and many different restrictive practices overseen by public and private authorities.

In 1992, however, the European market will become more unified than ever before. Twelve European nations will create a single internal market, called the European Community (EC), by removing the trade barriers that prohibit the free trade and sale of goods between countries, and deregulating the financial industries in an attempt to become a unified buying power such as the U.S. or Japan. The EC has more people that the U.S., with about the same gross national product.

Some of the benefits of a unified European market for companies trying to sell in Europe are:

- Changes in the government procurement regulations. In the past, many U.S. firms were either completely shut out or heavily discriminated against in favor of the home-country favorite.
- Reduced costs, delays, bureaucracy and red tape with the removal of the trade barriers. It creates one large market of 320 million people, and allows corporations to plan, produce, and market in one major market rather than 12 individual markets.
- A freer market where competition will create efficiency, innovation and progress.

U.S. companies are starting to map corporate strategy for the new era of an integrated European market by signing strategic alliances with European allies or by moving quickly to establish or enlarge plants and facilities inside the Common Market. [7,8,9,18]

In the PC market, competition in Europe is heating up from dominant U.S. rivals. All of the U.S. PC companies are benefiting from the lower dollar, and the profits of the European computer companies are being squeezed. To remain competitive, pressure is building to consolidate some of the PC companies into larger companies that are oriented towards Europe as a whole, rather than a single country. [1,2]

The past months have been marked by a diversification of the PC market in Europe. The PCs of the older generation have had their prices lowered, which increases demand. Simultaneously, higher performance PCs are pushing their way into the lower end of the multi-uses market, originally reserved for minicomputers and mainframes. The European market is no longer a single-product market, and buyers are looking harder at the strategies which best help their own businesses prosper over the next five years. [4]

PC Market Segments

According to IDC, there are four main markets in Europe: business/professional, scientific/technical, home/hobby and education. The unit shipments and value of shipments for 1987 is shown below.

1987 PC SHIPMENTS — WESTERN EUROPE
UNITS AND VALUE

SEGMENT	UNITS	%	VALUE (MIL$)	%	COST/PC
Business/Professional	2,589,100	43%	$ 8,256.6	70%	$ 3,293
Scientific/Technical	302,700	5%	1,403.8	12%	4,648
Home/Hobby	2,491,500	42%	1,260.6	11%	506
Education	591,100	10%	846.5	7%	1,432
TOTAL	5,979,350	100%	$11,767.5	100%	

SOURCE: IDC, 1988 [5]

This segmentation shows that the business/professional market is the largest in both units and value. Although the sci/tech segment is the lowest in units, it has the second highest shipped value. This discrepancy is due to the type of personal computers being sold to the individual markets. Scientific PC's are probably sold by the high-end companies that sell to the corporations. In this segment, it is the application, (software) not the hardware that carries a high price tag. Companies like Amstrad, Commodore and Atari sell low-end systems, frequently to the home and education markets. Companies like IBM, Hewlett-Packard and Apple sell high-end machines that are more powerful and thus expensive. These high-end machines are usually purchased by corporations.

Market Size

IDC and Intelligent Electronics Europe (IEE) shows the following market size for 1986-1988 for both units and shipment values. One of the reasons IEE's numbers are lower than IDC's is that IEE does not include home computers costing less than $600 in their market figures. To make the two companies' numbers more comparable, the third column is IDC's market figures with the home/hobby market figures removed. Even with this concession, IDC's market figures are still higher.

UNITS
EUROPEAN PC SHIPMENTS

	IEE	IDC	IDC (NO HOME)
1986	1,896	5,106	2,421
1987	2,601	5,979	3,486
1988	3,211	6,609	4,330

**VALUE OF
EUROPEAN PC SHIPMENTS**

	IEE	IDC	IDC (NO HOME)
1986	$ 6,772	$ 9,186	$ 8,078
1987	$ 9,180	$11,768	$10,507
1988	$10,013	$14,093	$12,708

SOURCES: Intelligent Electronics Europe, 1988 [4]
International Data Corp., 1988 [5]

Market Growth

In 1986, only 12% of European desks had PCs on them, compared to 18% in the U.S. Now, one in every 16 people living in Western Europe has a system. [5] The speed at which the market will grow, however, varies country by country. According to Intelligent Electronics (a subsidiary of Dataquest), within two years, 30% of Swiss office personnel are likely to have their own machines, versus only 20% in Italy.

The European PC market is one of the fastest growing regions in the world, with growth rates in shipped units of 70% between 1986 and 1987, and a 50% growth in the first half of 1988. According to Dataquest, that growth will slow in the second half of 1988, and the overall growth rate in 1988 will be 40%. [1]

In 1987 IDC estimates a 17% growth in units over 1986. In units, this translates to about 6 million units shipped in Western Europe in 1987, and projections of 6.6 million shipped in 1988 and 7 million shipped in 1989. By 1993, shipment levels are expected to approach almost 10 million units per annum. IDC also sees a slowdown in the rate of microcomputers shipments, with a 6% rise between 1988 and 1989. [3]

IDC and IEE (for systems costing over $600) show the following growth in units shipped between 1988-1993.

**UNITS SHIPPED
[In Thousands]**

	IEE	IDC	IDC (NO HOME)
1988	3,211	6,609	4,330
1989	3,738	6,996	4,803
1990	4,215	7,819	5,522
1991	-	8,585	6,136
1992	-	9,219	6,540
1993	-	9,983	7,099

SOURCES: Intelligent Electronics Europe, 1988 [4]
International Data Corp., 1988 [5]

VALUE OF SHIPMENTS
[In Millions]

	IEE	IDC	IDC (NO HOME)
1988	$10,013	$14,093	$12,708
1989	$10,827	$15,320	$13,783
1990	$11,363	$17,605	$15,908
1991	-	$19,556	$17,745
1992	-	$20,905	$19,003
1993	-	$22,853	$20,722

SOURCES: Intelligent Electronics Europe, 1988 [4]
International Data Corp., 1988 [5]

CHAPTER 4
MARKET LEADERS

There is a difference of opinion on the market leaders and their market share, depending on the marketing vendor questioned. All agree, however, that IBM, Amstrad and Olivetti are the three leaders in the European PC market in units shipped and/or value of shipments.

The three main market research companies providing these numbers are International Data Corp., Intelligent Electronics Europe (part of Dataquest), and Inteco, a European research company.

The three charts below show the top personal computer companies in Europe, with their market share by units shipped and by value of the PC market in 1987. Each table represents a different marketing research vendor, and is in descending order of market share by units shipped.

MARKET SHARE IN 1987 — IEE

COMPANY	UNITS	VALUE
IBM	19.3%	28.4%
Amstrad	10.7%	3.6%
Olivetti	9.5%	10.4%
Commodore	7.3%	3.1%
Atari	5.3%	1.4%
Apple	5.3%	5.8%
Tandon	3.2%	3.1%
Victor	2.8%	2.5%
Zenith	2.5%	1.9%
Compaq	2.3%	5.9%
Other	31.8%	33.9%
TOTAL	100.0%	100.0%

SOURCE: Intelligent Electronics Europe/Dataquest, 1988 [10]

IEE's market figures show that IBM, Amstrad and Olivetti have the largest market share. These three companies are in the top five based on figures from IDC, but IDC's numbers include all systems whereas IEE's figures cover only those PCs costing over $600.

MARKET SHARE IN 1987 — IDC

COMPANY	UNITS	VALUE
Amstrad	23.8%	9.7%
Commodore	22.0%	6.6%
IBM	9.8%	18.1%
Atari	7.0%	4.3%
Olivetti	5.0%	8.9%
Apple	3.2%	4.9%
Tandon	1.8%	3.0%
Hewlett-Packard	1.1%	3.4%
Compaq	1.2%	3.3%
Others	25.1%	37.8%
TOTAL	100.0%	100.0%

SOURCE: International Data Corp., 1988

Since IDC includes all sized computer systems, Commodore and Atari rank higher in market share because most of their systems are low-end. The home/hobby market figures can be removed from the numbers above to show market share that is more in line with the other companies' figures, as seen below.

IDC'S FIGURES WITHOUT HOME MARKET
UNITS SHIPPED IN 1987

	UNITS	VALUE
IBM	16.6%	20.2%
Amstrad	12.9	6.2
Commodore	9.1	4.3
Olivetti	8.4	10.0
Apple	5.2	5.3
Tandon	2.8	3.1
Atari	2.6	1.2
Bull	2.1	2.9
Compaq	2.0	3.7
HP	1.9	3.8
Other	36.4	40.0
TOTAL	100.0%	100.0%

SOURCE: International Data Corp., 1988

MARKET SHARE IN 1987 — INTECO
[Excludes Hobby PCs]

COMPANY	UNITS	VALUE
Amstrad	23%	10%
IBM	17%	24%
Olivetti	9%	8%
Apple	6%	11%
Compaq	4%	8%
Commodore	4%	3%
Bull	3%	4%
Tandon	3%	3%
HP	2%	4%

SOURCE: Inteco, 1988

Except for IBM, the top companies listed above (Olivetti, Amstrad, Apple, Hewlett-Packard and Compaq) are given more in-depth treatment on distribution and pricing strategies in Chapters 7 and 8. Commodore was excluded because it had the lowest shipment value, and its machines are not in the processor classes included in this study.

CHAPTER 5
COUNTRY OVERVIEWS

The overviews in this chapter povide the growth rate for the PC market (excluding home/hobby machines) as well as the market share by vendor shipments within individual countries. For a table with market share by microprocessor within each country, see Chapter 6. The charts at the end of this chapter show the market share by vendor from both IDC and Dataquest.

The following table summarizes the market size in thousands of shipped units for 1988, 1990 and the individual growth rate for each country.

COUNTRY	1988 [Thous.]	1990 [Thous.]	CAGR%
Belgium	107	246	18.1%
Denmark	95	164	11.5
France	756	1,233	10.3
Italy	491	939	13.9
Netherlands	332	342	0.6
Norway	89	134	8.5
Sweden	154	253	10.4
Switzerland	102	175	11.5
United Kingdom	882	1,360	9.1
West Germany	856	1,414	11.6

BELGIUM

IDC shows the following growth in PCs for Belgium from 1986 through 1993. The compound annual growth rate (CAGR) for 1988 to 1993 is 18%, the highest of the countries studied.

Year	Units Shipped [In Thousands]
1986	62
1987	97
1988	107
1989	122
1990	151
1991	189
1992	218
1993	246

SOURCE: International Data Corp., 1988 [5]

Both IDC and Dataquest agree that IBM was the market leader in Belgium, based on PC shipments in 1987, with between 18% and 23% of the market. Other major players include Olivetti, Amstrad, Commodore and Apple, although the two companies do not agree on the order or percentage market share. Belgium was the only country where Dataquest included Tandy in the top 10 vendors.

DENMARK

Denmark shows almost a 12% growth rate between 1988 and 1993 for units shipped.

Year	Units Shipped [In Thousands]
1986	61
1987	77
1988	95
1989	104
1990	119
1991	130
1992	151
1993	164

SOURCE: International Data Corp., 1988 [5]

IBM is the market leader for PCs with over 25% of the market. Both IDC and Dataquest agree that Olivetti is second in the market with between 11% and 14% share, and Commodore is third with between 9%-12%. Unisys and NCR are some of the top ten vendors in Denmark, as are Ericsson and Copam, both strong in Scandinavia.

FRANCE

France's growth rate is somewhat lower than others at 10.3% between 1988 and 1993, although it is one of the bigger markets.

Year	Units Shipped [In Thousands]
1986	429
1987	651
1988	756
1989	837
1990	1,007
1991	1,099
1992	1,139
1993	1,233

SOURCE: International Data Corp., 1988 [5]

Two French companies — Bull and SMT Goupil — are popular in France, although IBM and Amstrad are the market leaders. Atari is also more popular in France than in most other countries. Tandy has a 0.58% share of the French market.

ITALY

Italy has the second fastest growth rate at 14% between 1988-1993. PC prices also tend to be lower in this country, compared to France, U.K. and W. Germany (see Chapter 8: Pricing Strategies).

Year	Units Shipped [In Thousands]
1986	248
1987	347
1988	491
1989	542
1990	644
1991	777
1992	848
1993	939

SOURCE: International Data Corp., 1988 [5]

Olivetti, based in Italy, is the largest PC vendor with between 31%-35% market share. IBM is second in this market with around 24% of the PC market. Apple and Commodore are also in the top five.

NETHERLANDS

The Netherlands only shows a .6% increase in units shipped between 1988 and 1993. There seems to be a dip in units shipped between 1988 and 1990, 1991 is flat, and then a modest growth is shown through 1993. Part of this dip is attributed to the continued growth in the home/hobby market, while there is only modest growth shown in the forecast for the Netherlands as a whole, and a drop in shipments between 1988 and 1989.

Year	Units Shipped [In Thousands]
1986	151
1987	263
1988	332
1989	278
1990	292
1991	292
1992	305
1993	342

SOURCE: International Data Corp., 1988 [5]

IBM is the market leader in the Netherlands, with between 15-19% of the market. Tulip and Philips are Dutch companies that are strong in this market, and with Amstrad and Olivetti, these five companies have over 50% of the market.

NORWAY

Norway's growth rate of 8.5% for the next five years is also fairly low, compared to other countries.

Year	Units Shipped [In Thousands]
1986	60
1987	74
1988	89
1989	95
1990	103
1991	111
1992	116
1993	134

SOURCE: International Data Corp., 1988 [5]

Three Scandinavian PC companies are also strong in Norway — Copam, Ericsson and Acer/Multitech. Toshiba also has a strong presence in Norway, but IBM still has the major market share with over 25% of the market.

SWEDEN

Sweden's PC market will grow 10.4% annually through 1993, and it is one of the smaller markets.

Year	Units Shipped [In Thousands]
1986	102
1987	125
1988	154
1989	166
1990	182
1991	197
1992	219
1993	253

SOURCE: International Data Corp., 1988 [5]

Like Norway and Denmark, Sweden favors Ericsson and Copam systems, placing them in the top five or six companies in terms of market share. IBM has the major market share with 19.5%, Victor is second with between 10%-12%, and Apple is third with about a 10% share of the shipped systems. Toshiba is also strong in this market, as well is HP.

SWITZERLAND

Switzerland has one of the smallest markets, but shows an 11.5% growth rate between 1988 and 1993.

Year	Units Shipped [In Thousands]
1986	69
1987	87
1988	102
1989	117
1990	135
1991	149
1992	158
1993	176

SOURCE: International Data Corp., 1988 [5]

Dataquest places IBM at the top with 29% of the market, whereas IDC only gives IBM about 20%. Other leaders include Olivetti, Victor, Apple and Commodore.

UNITED KINGDOM

The United Kingdom has the second largest market for PC's, with a 9% growth rate to 1993.

Year	Units Shipped [In Thousands]
1986	535
1987	723
1988	882
1989	997
1990	1,097
1991	1,225
1992	1,291
1993	1,360

SOURCE: International Data Corp., 1988 [5]

Amstrad, a British company, is the market leader in the U.K. in units shipped, with IBM second. However, if one were to look at the value of the units shipped, IMB would be first. Atari is also a major vendor, as is another British company called Apricot. Tandy has a 0.8% share of the British market.

WEST GERMANY

The W. German market is the largest PC market in Europe with one of the fastest compound annual growth rates (11.6%).

Year	Units Shipped [In Thousands]
1986	471
1987	684
1988	856
1989	985
1990	1,156
1991	1,237
1992	1,309
1993	1,414

SOURCE: International Data Corp., 1988 [5]

IBM and Commodore are the top two market leaders, although IDC and Dataquest disagree on which is first. Siemens and Nixdorf are German companies that also sell well in this market. Atari is one of the top three or four, and Tandy has a 0.47% market share, according to Dataquest. [5,10]

1987 IDC VENDOR SHARE BY COUNTRY
[No Home/Hobby Units]

UNITS SHIPPED PERCENT SHARE

BELGIUM

IBM	18,075	18.7%
Amstrad	14,428	14.9%
Commodore	12,627	13.1%
Olivetti	10,900	11.3%
Apple	5,800	6.0%
Compaq	3,220	3.3%
HP	2,400	2.5%
Unisys	2,195	2.3%
Others	26,905	27.9%
TOTAL	96,550	100.0%

DENMARK

IBM	19,550	25.5%
Olivetti	9,011	11.8%
Commodore	7,612	9.9%
Amstrad	4,682	6.1%
NCR	4,130	5.4%
Copam	2,700	3.5%
HP	2,550	3.3%
Toshiba	1,931	2.5%
Unisys	1,840	2.4%
Ericsson	1,568	2.0%
Others	21,026	27.4%
TOTAL	76,600	100.0%

FRANCE

Amstrad	87,600	13.4%
IBM	86,000	13.2%
Apple	69,825	10.7%
Olivetti	52,700	8.1%
Atari	50,700	7.8%
SMT Goupil	38,360	5.9%
Bull	35,590	5.5%
Tandon	21,350	3.3%
Compaq	14,300	2.2%
Sun	2,720	0.4%
Others	192,655	29.6%
TOTAL	651,800	100.0%

ITALY

Olivetti	109,862	31.7%
IBM	82,600	23.8%
Commodore	38,400	11.1%
Apple	12,550	3.6%
Honeywell	11,855	3.4%
Unisys	8,000	2.3%
Others	83,233	24.0%
TOTAL	346,500	100.0%

NETHERLANDS

IBM	40,450	15.4%
Philips	37,450	14.2%
Tulip	27,925	10.6%
Olivetti	25,000	9.5%
Amstrad	15,880	6.0%
Commodore	12,465	4.7%
Apple	10,445	4.0%
Wang	7,679	2.9%
Tandon	7,540	2.9%
HP	4,050	1.5%
Others	74,416	28.3%
TOTAL	263,300	100.0%

NORWAY

IBM	18,970	25.6%
Commodore	6,933	9.4%
Copam	5,060	6.8%
Olivetti	3,870	5.2%
Apple	3,800	5.1%
Toshiba	3,676	5.0%
Acer	2,641	3.6%
Ericsson	2,500	3.4%
Tandon	2,315	3.1%
HP	2,310	3.1%
Apollo	290	0.4%
Other	21,635	29.2%
TOTAL	74,000	100.0%

SWEDEN

IBM	24,455	19.5%
Victor	13,500	10.8%
Apple	11,700	9.3%
Ericsson	10,000	8.0%
Copam	9,900	7.9%
Commodore	9,107	7.3%
Amstrad	7,692	6.1%
Toshiba	4,262	3.4%
HP	2,220	1.8%
Nixdorf	1,750	1.4%
Others	30,914	24.6%
TOTAL	125,500	100.0%

SWITZERLAND

IBM	17,222	19.8%
Commodore	12,355	14.2%
Atari	10,393	11.9%
Olivetti	6,330	7.3%
Victor	6,320	7.3%
Unisys	4,020	4.6%
Apple	3,300	3.8%
HP	3,180	3.7%
NCR	3,170	3.6%
Bull	2,810	3.2%
Compaq	2,310	2.7%
Others	15,590	17.9%
TOTAL	87,000	100.0%

UNITED KINDOM

Amstrad	184,700	25.7%
IBM	111,475	15.5%
Apple	40,500	5.6%
Atari	31,650	4.4%
Olivetti	26,000	3.6%
Tandon	25,900	3.6%
Apricot	20,660	2.9%
Compaq	16,850	2.3%
HP	12,910	1.8%
DEC	5,500	0.8%
Sun	4,030	0.6%
Others	237,825	33.1%
TOTAL	718,000	100.0%

W. GERMANY

IBM	103,870	15.2%
Commodore	149,850	21.9%
Atari	70,550	10.3%
Tandon	37,230	5.4%
Siemens	23,000	3.4%
Amstrad	40,700	6.0%
Nixdorf	22,000	3.2%
HP	16,400	2.4%
Compaq	17,100	2.5%
Olivetti	24,020	3.5%
Epson	31,400	4.6%
Others	611,530	89.4%
TOTAL	684,000	167.8%

DATAQUEST MARKET SHARE BY COUNTRY
1987 UNIT SHIPMENTS

BELGIUM

	UNITS	%
IBM	20900	23.76%
OLIVETTI	8800	10.01%
COMMODORE	7900	8.98%
APPLE	5550	6.31%
ATARI	5500	6.25%
AMSTRAD	4000	4.55%
PHILIPS	2700	3.07%
TANDY	2600	2.96%
ZENITH	2350	2.67%
TOSHIBA	2300	2.62%
OTHER	25350	28.82%
TOTAL	87950	100.00%

DENMARK

	UNITS	%
IBM	21850	28.60%
OLIVETTI	10750	14.07%
COMMODORE	9550	12.50%
AMSTRAD	3400	4.45%
COPAM	3100	4.06%
NCR	2300	3.01%
APPLE	2200	2.88%
ERICSSON	2050	2.68%
UNISYS	1500	1.96%
HP	1450	1.90%
TANDY	0	0.00%
OTHER	18260	23.90%
TOTAL	76410	100.00%

FRANCE

	UNITS	%
IBM	86100	14.64%
AMSTRAD	68000	11.56%
APPLE	54300	9.23%
ATARI	40200	6.83%
BULL	38500	6.54%
GOUPIL	35700	6.07%
OLIVETTI	32900	5.59%
VICTOR	28000	4.76%
ZENITH	24350	4.14%
COMPAQ	17000	2.89%
TANDY	3400	0.58%
OTHER	159800	27.17%
TOTAL	588250	100.00%

ITALY

	UNITS	%
OLIVETTI	110000	34.47%
IBM	78400	24.57%
APPLE	13100	4.11%
COMMODORE	12100	3.79%
ATARI	7500	2.35%
AMSTRAD	6500	2.04%
UNISYS	6000	1.88%
COMPAQ	3200	1.00%
NCR	3200	1.00%
ERICSSON	2850	0.89%
TANDY	0	0.00%
OTHER	76260	23.90%
TOTAL	319110	100.00%

NORWAY

	UNITS	%
IBM	16659	22.46%
COMMODORE	6150	8.29%
COPAM	5000	6.74%
APPLE	3850	5.19%
TOSHIBA	3850	5.19%
OLIVETTI	3750	5.06%
ACER/MULT	3020	4.07%
ATARI	2150	2.90%
TANDON	1900	2.56%
ERICSSON	1500	2.02%
TANDY	0	0.00%
OTHER	26341	35.51%
TOTAL	74170	100.00%

SWEDEN

	UNITS	%
IBM	26800	20.27%
VICTOR	16500	12.48%
APPLE	14100	10.67%
COMMODORE	12600	9.53%
ERICSSON	9500	7.19%
COPAM	8800	6.66%
TOSHIBA	5400	4.08%
ATARI	5300	4.01%
AMSTRAD	3600	2.72%
HP	2050	1.55%
TANDY	0	0.00%
OTHER	27550	20.84%
TOTAL	132200	100.00%

SWITZERLAND

	UNITS	%
IBM	33600	29.28%
OLIVETTI	15000	13.07%
COMMODORE	10800	9.41%
APPLE	11300	9.85%
VICTOR	6400	5.58%
AMSTRAD	5500	4.79%
NCR	5000	4.36%
TOSHIBA	2600	2.27%
ATARI	2400	2.09%
HP	1900	1.66%
TANDY	0	0.00%
OTHER	20250	17.65%
TOTAL	114750	100.00%

THE NETHERLANDS

	UNITS	%
IBM	42700	19.83%
OLIVETTI	26000	12.07%
TULIP	25050	11.63%
PHILIPS	14600	6.78%
APPLE	11500	5.34%
COMMODORE	10400	4.83%
AMSTRAD	8000	3.71%
ATARI	7400	3.44%
TANDON	6100	2.83%
WANG	4400	2.04%
TANDY	2000	0.93%
OTHER	57200	26.56%
TOTAL	215350	100.00%

UNITED KINGDOM

	UNITS	%
AMSTRAD	121000	22.56%
IBM	112500	20.98%
ATARI	30000	5.59%
OLIVETTI	26500	4.94%
TANDON	25500	4.75%
COMMODORE	23100	4.31%
ZENITH	22900	4.27%
COMPAQ	22400	4.18%
APPLE	16800	3.13%
APRICOT	14100	2.63%
TANDY	4300	0.80%
OTHER	117200	21.85%
TOTAL	536300	100.00%

WEST GERMANY

	UNITS	%
COMMODORE	103000	17.86%
IBM	77000	13.35%
AMSTRAD	64000	11.10%
ATARI	51000	8.84%
TANDON	35000	6.07%
OLIVETTI	24200	4.20%
SIEMENS	21500	3.73%
APPLE	14000	2.43%
VICTOR	13900	2.41%
COMPAQ	13300	2.31%
TANDY	2700	0.47%
OTHER	157100	27.24%
TOTAL	576700	100.00%

CHAPTER 6
PROCESSORS

The personal computer has several different architectures that are based on Intel's microprocessor chips. The 8086/8088 chip is an 8-bit machine, the Intel 80286 is a 16-bit machine, and the 80386 chip is a 32-bit machine.

The IBM PC compatible has become a standard in Europe as it is in the U.S. The majority of the systems (80%) in the business/professional market are PC-compatible as well as in the scientific/technical market (about 58%). [5]

In 1987, IBM introduced its new PS/2 in Europe with the Micro Channel Architecture. IBM has high hopes for its PS/2 — Europe seems to be adopting the Micro Channel architecture faster than the U.S. In 1988, about 60% of IBM's personal computer sales have been on MCA products. [1]

In 1987, just under half of the PCs sold in Europe last year were 8-bit machines. This was up from 1986, because of companies like Amstrad that sell low-end machines, and its growth shows how elastic the PC market really is. Dataquest, however, predicts a "lingering death" for the 8088 processors.

Sales of the 80286 almost doubled in 1987, and should have the largest share of the PC market in 1988. The rise of the 16-bit machine shows that the need for speed is spreading. The even faster 80386 machines had a very small part of the market in 1987, but this market will grow in 1988. [1]

The chart below shows the market share by processor type for 1987 for Western Europe as a whole.

1987 MARKET SHARE BY PROCESSOR TYPE

PROCESSOR	INTECO*		DATAQUEST	IDC
	1987	1990	1987	1987
8086/8088	44%	23%	44%	29%
80286	28%	45%	35%	17%
80386	4%	20%	2%	2%
68000 and others	24%	12%	19%	52%
Total	100%	100%	100%	100%

* All PC's excluding hobby

SOURCES: Inteco, 1988 [6]
Dataquest, 1988 [10]
International Data Corp., [5]

Dataquest also provides a breakdown of the business vs. home market by processor type, as shown below.

PROCESSOR	BUSINESS	HOME
8086/8088	42%	50%
80286	43%	2%
80386	2%	0%
Other	13%	48%
Total	100%	100%

SOURCE: Dataquest, 1988 [10]

Speed and performance are not only affected by the hardware; the operating system is also important. DOS is the operating system used most frequently, but it is tailored to the 8-bit machines. There is no popular operating system that fully exploits the power of the 16- and 32-bit machines. The sales of the 80286-based machines will rapidly drop off as the cost of the 32-bit PCs drop because the only difference between them will be speed.

Two of the operating systems that promise to use the power of these faster machines are UNIX and OS/2. UNIX is very popular among the workstation users, and may catch on in the PC market as the lines between the two markets become increasingly less defined. [11]

Microprocessor Shipments By Country

The following chart shows microprocessor shipments by country for 1987.

MICROPROCESSOR SHIPMENTS BY COUNTRY
[In Thousands]

	8086/88	80286	80386	OTHER	TOTAL
Belgium	37.9	25.3	1.4	23.5	88.1
Denmark	33.9	28.8	1.5	12.2	76.4
Finland	15.8	22.9	0.7	12.7	52.1
France	251.5	197.6	8.4	130.9	588.4
Italy	159.7	106.1	6.8	46.7	319.3
Netherlands	109.0	66.9	3.2	36.4	215.5
Norway	27.6	28.4	1.1	17.0	74.1
Spain	82.3	51.3	1.2	9.8	144.6
Sweden	48.0	42.5	1.3	40.4	132.2
Switzerland	44.8	66.9	2.7	24.9	139.3
United Kingdom	250.4	178.7	11.9	50.2	491.2
W. Germany	218.0	191.9	7.3	140.1	557.3
Other	39.6	27.9	1.4	23.1	92.0
Total	1318.5	1035.2	48.9	567.9	2970.5
% of Total	44.39%	34.85%	1.65%	19.12%	100.00%

SOURCE: Dataquest, 1988 [10]

The use of PC compatibles varies from country to country. For instance, in 1986, IBM-compatible PCs represented just under 80% of PC shipments for Norway, while in

Finland, it was only 55%. W. Germany had the lowest market penetration for IBM compatibles in Europe with only about a quarter of all PCs shipped meeting the definition of compatibility. [17]

CHAPTER 7
DISTRIBUTION STRATEGIES

There are three main distribution strategies used by PC vendors in Europe: The first is direct shipment to the customer from the vendor; the second, is the use of distributors and/or dealers; and the third is mass merchandising, mostly for low-end computers targeted at the home and educational markets.

Direct sales are used by major manufacturers that have an existing direct sales force to address the large accounts market. However, over the years, large PC dealers have established themselves as the qualified suppliers to this market sector, and the direct channel is no longer considered to be best adapted to a large-account sales strategy. Point in favor of using dealers is that the manufacturer has the advantage of dramatically enlarging its market presence and promotional efforts. This explains how Compaq and Apple have been able to enter the large corporate market without a sales force. [11]

Market Share by Channel

Inteco shows the following market-share by channel for 1987. It includes all PCs priced under $15,000 used for non-hobby applications.

MARKET SHARE BY CHANNEL
1987

Big Dealers	32%
Small Dealers	30%
Direct	18%
Retail*	11%
CSC**	9%
TOTAL	100%

* Retail includes general retailers where more than 50% of sales revenue comes from non-PC general goods.

** CSC is a Computer Service Company, which includes VARs, software houses, systems integrators, etc.

SOURCE: Inteco, 1988 [12]

Trends

Three very significant distribution trends have become increasingly evident during the past years:

- *Differentiation* — Dealers are moving away from standard dealerships towards becoming value-added resellers, aiming their products at a particular market niche. The discounting war in Europe has resulted in poor profitability for almost all PC retailing activity, and major manufacturers have encouraged their dealers to increase the value-added component of their sales. The market share taken by the VARs has visibly increased over the last two years.

- *Concentration* — The more professionally-managed chains and bigger dealers have become stronger in the market. Franchising in Europe has become increasingly difficult to implement. In each individual country, the relatively small size of the markets combined with the lack of product exclusivity in a distribution franchise have meant that competition between established dealer and new franchisees have been especially fierce. ComputerLand is the only organization on a Europe-wide scale that has been able to create an adequate support structure for its franchisees.
- *Mass Merchandising* — Mass merchandising at the low-end of the market has become increasingly important. The recent demand for compatible PCs from the home and education markets indicates a potential for large-volume sales in the near future and the appropriateness of low-end PCs indicates a potential for this distribution channel. Southeast Asia and Amstrad are strong in this channel. Mail order is also included in this channel.

The distribution structure that is emerging uses all three traditional channels. Direct sales and large PC dealers and distributors sell to the large companies in an attempt to maintain account control. VARs sell to the medium-sized company and the computer service companies sell to the small company. The small PC dealers and general retail chains sell to the home business.

Inteco believes that in 1990, the distribution channels used will resemble those of today, but there will be little direct sales from the manufacturers. [1]

SEGMENT	CUSTOMERS	DISTRIBUTION CHANNEL
Business and Scientific	Large companies	Direct sales Large PC dealers
	Medium Companies	VARS
	Small Companies	Computer Service Companies
Home	- -	Small PC Dealers Retail Chains

Distribution By Vendor

Most of the companies included in the table below distribute the majority of their PCs through the indirect channel. Tandy is the only exception, for it ships its products through its own distributor to its own stores (see Tandy, Page 31).

1987 SHIPMENTS
BY DISTRIBUTION CHANNEL

	DIRECT	PERCENT	INDIRECT	PERCENT	TOTAL
IBM	$359.5	11.0%	$2,921.2	89.0%	$3,280.7
Olivetti	494.9	45.5	592.5	54.5	1,087.4
Apple	22.0	3.6	586.6	96.4	608.6
Compaq	22.1	5.3	396.6	94.7	418.7
Amstrad	15.3	4.1	357.3	95.9	372.6
Commodore	17.4	5.3	311.2	94.7	328.6
Tandon	38.0	12.0	279.2	88.0	317.2
HP	111.9	42.4	151.9	57.6	263.8
Bull	94.0	37.6	156.0	62.4	250.0
Tandy	26.9	90.0	3.0	10.0	29.9

SOURCE: Dataquest, 1988 [10]

Vendor Market Share

The following chart shows the corporate market share by distribution channel for Western Europe. Southeast Asia is included in the direct channel because its machines are generally imported by distribution organizations that sell directly to end users (using sales methods such as couponing and mail order).

VENDOR MARKET SHARE BY CHANNEL
1987

COMPANY	DIRECT CHANNEL	INDIRECT CHANNEL
IBM	9.2%	22.9%
Olivetti	17.3%	6.8%
Amstrad	0.0%	13.7%
Commodore	0.0%	9.4%
Atari	0.0%	7.0%
Apple	0.0%	7.0%
Southeast Asia	13.0%	0.0%
Others	60.5%	33.5%
Total	100.0%	100.0%

SOURCE: Dataquest, 1988 [10]

This table highlights the importance of the direct channel to Olivetti, as well as the trend of higher sales through dealers and distributors.

Corporate Distribution Strategies

A brief description of individual corporate distribution strategies follows for the top PC vendors in W. Europe (except IBM) and Tandy.

Amstrad: Its strongest sales are in the U.K. (where it is based), W. Germany, France and Spain. Amstrad uses 10 distributors throughout Europe, and sells its products through retail stores. New products were introduced in September 1988 that are aimed at the corporate accounts, and existing dealers can apply for the distribution rights for these products as well. Smaller suppliers can also purchase machines from distributors.

Apple: Apple reorganized in August 1988, and Apple Europe is one of the four new divisions. [15] All its products are sold through authorized dealers. Apple has a manufacturing plant in Ireland, and its products are shipped from there to the European subsidiaries (France has the strongest subsidiary). From the subsidiary, the products are shipped to the dealers and distributors. [12]

Apple has been having problems with gray-market sales of its computers, where unauthorized dealers buy from the authorized dealers, then sell the systems at a steep discount. Authorized dealers are willing to risk these sales even though it cuts their margins because it increases their volumes and helps them to meet quotas. According to one source, between 2%-4% of Macintoshes sold annually are through unauthorized dealers. [14,15]

Compaq: Compaq has no direct sales and does not use distributors. Its systems go straight to the dealer. [12]

Hewlett-Packard: HP sells its products directly to the customer as well as through the indirect channels in all countries. It sells more peripherals than PCs in Europe. [12] HP has six manufacturing sites located in France, Germany, England, Spain and Scotland. Some of these manufacturing sites house multiple divisions; in other words, PCs are only a portion of the total manufacturing business in which HP is involved. HP uses distribution centers that hold inventory. These inventories must support the geographic area that they serve. When a retailer orders its PCs, they are shipped from the distribution center directly to the dealer. HP usually sells to large dealers, who buy in bulk, although they will occasionally sell a smaller order. HP is trying to gear its PC sales towards multi-quantity sales. [19]

Olivetti: Olivetti sells directly to customers as well as through dealers, and its direct channel is very important. It avoids channel conflict by designating named accounts in each country (Inteco estimates 100 in the U.K.) to which the dealers cannot sell. Olivetti manufacturers its PCs in Italy. [12]

Tandy: Tandy ships its products to Europe through its subsidiary InterTan. It sells its PCs either through company-owned retail stores or through franchises, which use the Tandy trade name and trademarks. InterTan says 90% is through company-owned stores, 9% through franchises and 1% through distributors. InterTan operates as both a distributor and a retailer. The retail stores are located in the U.K., France, Belgium, and Holland. The store in Germany is franchised. Where there are no stores, InterTan ships to distributors/dealers (Finland, Sweden, Italy, Spain, Switzerland and Austria). Tandy's inventory is stored in three warehouses located in Birmingham, England; Brussels, Belgium; and Lille, N. France. [18]

Dealers

Inspired by the rapid growth rate, U.S. dealers are trying to expand into international sales. Most dealers either build their own distribution networks in Europe, purchase distributors/dealers already in the targeted market, or sign distributors as affiliates and sell through them. One of the problems of selling in Europe is that each country has its own staffing and product mix problems. Competition varies from country to country, and there are no pan-European distributors.

For instance, Sofsel is generally regarded as having the longest lead in the European market. It opened its first European market in the U.K. in 1985, and now has wholly-owned operations there and in France. Sofsel also has affiliate agreements with distributors in Belgium, Germany, Holland, Scandinavia, Switzerland, and Greece. It took better than two years to build market share, according to Mike Pickett, the president.

Other distributors trying to expand to Europe include Microamerica, Kenfil Distribution Inc., and Micro D. [14]

Some of the larger European dealers are:

Europe as a whole:	ComputerLand Businessland Sofsel
Denmark:	BFC Data Danadata
France:	Agena Asystel LTA MID Random
Italy:	Seltering Sirio Shop
Netherlands:	Alpha Computer Diensten L&T
Scandinavia:	Kontorsutveckling
Spain:	Club Informatico Holding Servicios
United Kingdom:	Comutacenter MBS Bonsai Personal Computers P&P Computers
West Germany:	Dataservice Natic Polisoft PCM [10,14]

CHAPTER 8
PRICING STRATEGIES

Inteco supplied the following information on pricing for systems in several companies. The dollar figure is based on the September 1988 conversion rate. In order to obtain these figures, every other month Inteco obtains the list price and the street price of various models, and determines the "average" price of a system.

		PRICE IN:			
COMPANY	MODEL	GERMANY	FRANCE	UK	ITALY
Apple	Mac II	$9,163	$7,423	$8,586	$7,278
Apricot	Xen-1/45			5,580	
Bull	Micral 60		7,038		
Compaq	286 20	4,816	4,905	4,797	3,822
Deskpro	386S 40	5,455	5,493	5,431	4,323
	386 40	6,948	6,653	7,166	5,708
	386/25 110	11,115	10,946	10,888	8,890
IBM	30 021	3,102	3,512	3,834	2,827
PS/2	50 Z	7,200	7,627	8,584	6,844
	70 F61	8,564	9,906	10,159	8,199
	70 A21	11,331	13,588	13,802	11,141
	80 041	8,410	10,311	10,973	8,122
Olivetti	M280				5,319
Tandon	PCA 40+	3,982			

SOURCE: Inteco, 1988 [12]

From this chart, it is obvious that Italy's prices are much lower than the other three countries.

Dealer Discounts

Inteco had no estimate for the margins that dealers have. However, in an article that reviews the Amstrad PC1512, a low-end 8086 machine, is a retail spec sheet included that shows that dealers receive a discount of 22%-30%. [13]

CHAPTER 9
SOURCES

1. "Europe Welcomes PCs in Fast-Paced Spree"
   Computer Systems News, 10/3/88, PP:26

2. "Europe's Computer Makers Come Down to the Crunch"
   Business Week, 10/19/88, PP:145-150

3. "Heavy Micro Volume in Europe Won't Last, Research Shows"
   PC Week, 10/ /88, PP:131

4. "The Rise of the European PC Industry"
   Electronic Business, 2/15/88, PP:122-125

5. *Personal Computers In Europe: Data, Forecasts and Analysis 1987-1993*
   INTERNATIONAL DATA CORP., 1988

6. Interview with Don McGuire
   INTECO, October 21, 1988

7. "Vendors Meet To Discuss New Challenges in Global Market"
   PC Week, 6/28/88, PP:131

8. "Borderless Europe: Promise and Pitfalls for U.S. Firms"
   Electronic Business, 10/15/88, PP:46-48

9. "Inside the Fortress: Europe after 1992"
   Electronic Business, 10/15/88, PP:38-41

10. Interview with Joan Howelinski, Analyst
    DATAQUEST, October 1988

11. "Chasing Pack on IBM Trail as PCs Go Skywards"
    Electronics Weekly, 5/4/88, PP:22

12. Interview with Lisbet Tolson, Analyst
    INTECO CORPORATION, October 1988

13. "Amstrad PC1512, Which Took Europe By Storm, Hits U.S."
    Computer & System News, 8/10,87, PP:37

14. "Alarmed Apple, IBM Target Crackdowns of Gray Market"
    PC Week, 3/12/88, PP:121

15. "Apple Changes to Have Little Impact on Resellers"
    Computer & Software News, 8/29/88, PP:3,100

16. "U.S. Computer Firms Gear Up For Lifting of EEC Trade Barriers"
    PC Week, 7/25/88, PP:113

17. "Rehearsing for the Next Act in the IBM-Compatible Market in Europe"
Computer Industry Report, 12/18/87, PP:4-7

18. Interview with Lewis G. Newman
INTERTAN, October 1988

19. Interview with Doug Morton
HEWLETT-PACKARD, October 1988