Global Equity Research

The Internet in Europe

Warburg Dillon Read

Contents

Prices taken at close 4 January 2000

Whatsnext.com

Internet penetration recently passed the critical 10% threshold in Europe. We believe this should be sufficient to trigger a sharp increase in corporate investment and to attract even greater investor interest from now on. Rather than seeking to make recommendations on individual stocks, we explore the trends at play at each of the layers of the European internet economy, endeavour to identify the risks and opportunities at each level and the main beneficiaries.

Fresh momentum for internet infrastructure and application companies

The growth dividends should flow to telecos geared for data growth, the big software houses and local consultants

We conclude that internet infrastructure and application players are likely to be the biggest money makers simply because usage is growing in Europe. European telecommunication-related players that are geared up for data growth should excel. European IT companies with large client bases, and emerging local internet consultants could present compelling opportunities. The drivers? We expect 15% of subscribers to traditional European telecom services to migrate to internet service providers (ISPs) by 2003. On top of this, 70% of traffic growth on the same horizon should be driven by internet applications. Our models show that, by 2002, internet/intranet spending should represent close to 30% of total annual European IT investment, implying a CAGR of 67% for service companies and 29% for software houses.

We see upheaval among portals

Too many portals chasing too few users

We believe there are too many portals competing for a still small on-line consumer base dispersed across 15 countries. The economics –modest on-line ad revenues, low transaction fees, and high cost structures– are likely to drive a large number of portals out of business. While portals have long been the darlings of internet strategists in the US (rewarding their faith with hard dollars), 43 firms are competing for portal business on this side of the Atlantic. Combined they operate 95 broad portal sites. We see room for only five big players in Europe.

Traditional retailers set to capture the lion's share of European e-tailing

Rather than being brushed aside by e-tailers, we expect traditional retailers to go on-line themselves

European retailers have been relatively slow to enter the internet race, and are thus unlikely to gain a competitive edge in the long term over US operators. One of the great advantages of the internet is that it ignores frontiers. So far, European retailer valuations have barely been affected by the internet, but we believe it is only a matter of time before on-line shopping has a significant impact. Nonetheless, we do not believe that e-tailers will condemn traditional retailers to extinction. Indeed, traditional retailers are at the forefront of e-tailing in Europe.

Business-to-business: a greenfield in Europe

As the B2B model loses its mystique, expect the competition floodgates to open

The B2B market can still be considered a greenfield in Europe. However, we believe that on-line trade will thrive as the advantages of B2B become clear. On the other hand, as the B2B operating model loses its mystique, market-makers are likely to face increasing competition. In our view, to survive, these marketplaces must link with other sites (eg, with the sites of related trade journals). We believe the real winners at this level are likely to be the e-marketplace hosting companies that can turn transaction flows into valuable, marketable data.

Overview

Ignore the internet at your peril

15% of North American GDP growth and 26% of market capitalisation growth in 1999

The internet is now a key component of the North American economy and a major engine of growth. In 1999, the web generated 15% of regional GDP growth and 26% of market capitalisation growth. In just three years, the "net" has become an economic sector in its own right, and one that the rest of the economy would ignore at its peril.

The internet economy now surpasses century-old traditional industries

A US$1.2trn economy by 2002 even if the growth rate slows to half the current pace

At an estimated US$507bn in revenues and 2.5 million jobs in 1999, the internet economy has zoomed past century-old industries such as airlines (US$355bn) in size and is fast approaching the publishing (US$750bn) and healthcare industries (US$1trn). If the internet economy were to grow over the next three years at just half WDR's estimated current rate of 68%, annual revenues would reach US$1.2 trn in 2002.

Deconstruction: a new strategy paradigm

Vertical integration has been the winning value creation model for over a century…

Since the late nineteenth century, the winning value creation model has been vertical integration. A century later, we are seeing the "deconstruction" of these value chains as market forces undermine the business culture upon which many of the world's biggest companies are built. The traditional frontiers between trades, companies, and entire industries are falling fast.

…but is now being swept aside by the information revolution

The most powerful catalyst for change is undoubtedly the information revolution. Information exchange was the cement that held the vertical integration value chain together. But such was the cost of maintaining a rich data flow between suppliers, distributors and clients that companies, until very recently, had no choice but to use their own resources to develop each link in their information chain, and retain ownership of it.

It has never been easier or cheaper to seek and exchange information

The advent of the World Wide Web and global communication standards has created a whole new ball game. Open system architecture makes it possible to exchange any type of data instantly, from anywhere in the world, all for next to nothing. In a nutshell, it has never been easier or cheaper to seek and exchange information.

Pulling the e-levers

Corporates today face a stark choice: either go on the defensive, or get wired

Whatever the sector, region or market, the internet is both a threat and an opportunity for off-line industries. Most major corporations are now at a crossroads: either they take a defensive stance to protect their value, or they seize the opportunities offered by the web. Corporates that do get wired can:

- **Reduce costs by optimising processes:** For physical procedures, case studies show that the greater the use of the internet throughout the corporate value chain, the greater the savings. Costs can be cut through greater automation and/or reduced working capital.

- **Create value by enriching their offer.** Beyond cost reductions and reduced working capital, the internet can create value through info-mediation, which is a new step in the value chain, aimed at enriching the relationship with customers by supplying them with valuable information. and/or the creation of new products. for the web draws on the internet's micro-segmentation potential, ie, the ability to tailor products to a customer's specific needs at the same cost as a standard product.

Gauging e-value in a universe governed by Heisenberg's uncertainty principle

"The more precisely the POSITION is determined, the less precisely the MOMENTUM is known in this instant, and vice versa"

Our maxim is "nothing is certain, but everything is probable". However successful, there are real risks in even the most successful e-business. Not least, the management must operate without the certainties that have prevailed in the business world for the last hundred years or so. In this respect, the post-internet business world appears to have more in common with fuzzy quantum mechanics than the snug model it is superseding:

- **A whole new paradigm:** In such an unstable universe, risk management (eg, the evaluation of manpower needs and the appropriate financial resources with zero visibility) is more important than a detailed business plan; close observation is more important than careful research; and responsiveness prevails over the ability to forecast.
- **Three steps to growth:** Our retrospective research shows that a new growth paradigm is behind every successful e-strategy: (1) corner the market by seizing scarce resources; (2) manage mega-growth; (3) transform some market share into profit.
- **Stay in start-up mode:** Given the constant change in the marketplace, any company with real ambitions for the net must permanently live with a high degree of risk and uncertainty. In this context, it is perhaps wise to begin with projects that entail modest initial unit costs (not too difficult with new technology) and then increase investment as success grows.

The market has anticipated this migration and rewarded the trend setters

The flow of funds into the internet economy has been breathtaking

The stockmarket, venture capitalists and private investors are all allocating an increasing amount of time and capital to the internet. As a result, considerable resources have been switched out of smokestack industries and into the internet. In some instances, the migration of value has been dramatic.

The average market cap. of the 300 top US internet companies is 33x higher than the NASDAQ average

Even though the Wall Street mania for dot-com companies has already reached epic proportions, a look at 1999 performances shows that investors still strongly favour internet-related companies and reward them with their investment dollars. The 300 companies doing the most business on the internet have a current average market capitalisation of US$20bn. That is 33 times the US$600m average market cap for the 5,100 NASDAQ listed companies.

By channelling funds into the development of the internet, investors are accelerating the migration of value

Investors are putting money into the future, not the past… and could be considered the most important customers of internet companies

Rather than a reward for past successes, the flow of funds into internet stocks can be considered as financing for future projects. Quite simply, investors are prepared to pay now for future value creation. The market is confident that this value will materialise, and is therefore happy to back companies in the vanguard of the internet revolution. In many ways, the most important customers of these companies are not the users who sign up for their services, but the investors who are buying their future profits.

Europe has now passed the critical 10% penetration mark

Is Europe set to go down the same path as the US?

We believe Europe today is at the same stage as the US was three years ago. Internet penetration remains low this side of the Atlantic, but passed the critical 10% of the population in 1999. We believe this should be sufficient to trigger a sharp increase in corporate investment and to attract even greater investor interest from now on.

We think not

However, we do not subscribe to the view that what is happening in the internet in Europe is more or less a rerun of the US experience minus three years. Why? Because there are a huge number of variables at play in Europe, especially when compared to the US:

- **internet penetration is unequal:** Greece had the lowest web penetration rate at end 1999, with only 2.6% of the population connected compared to 31% in the leading country, Finland.
- **Usage varies greatly:** Home usage is more common in early-adopter countries such as Finland, Sweden and Netherlands. In countries with low web penetration, such as Spain and Portugal, access is predominately from work and school.
- **Web access device preferences vary:** We are currently witnessing the development of inexpensive new web access devices, which look set to democratise access. However, our studies show that while consumers in the Nordic countries are likely to take to mobile phone access once third generation technology comes along, it appears that Benelux users would prefer digital TV or cable access.
- **Language differences:** To reach 70% of the audience in Europe, content needs to be translated into at least five languages.
- **Legislation and regulation are not harmonised:** To give just on example, VAT rates vary between 15% to 25% in Europe. Telco interconnection charges also vary greatly from one country to another.

What does this mean in terms of internet investment opportunities in Europe? Our conclusion is Be Selective. Infrastructure and applications players are likely to be the biggest money makers simply because usage is growing. We believe there is room for only five broad portals in Europe. Traditional retailers look set to capture the lion's share of European e-tailing. E-marketplace hosting companies are likely to be the real winners in the greenfield B2B sector.

The internet: not a stockmarket bubble but a real migration of value deftly anticipated by the market

Ignore the internet at your peril

The internet is now a key component of the North American economy and a major engine of growth. In 1999, the web generated 15% of regional GDP growth and 26% of market capitalisation growth. In just three years, the "net" has become an economic sector in its own right, and one that the rest of the economy would ignore at its peril.

The speed of this development can be described as breathtaking, and the consequences occasionally surprising. Car makers did not see Autobytel coming, or if they did, then too late. Amazon.com had already built what looks to be an unassailable lead before Barnes & Noble decided to get wired, while the *Los Angeles Times'* free on-line small ads threaten to reduce ink-and-paper margins by 30-40%.

The internet has significant valuation implications for many sectors, on both the upside and downside

More than just a new economic powerhouse, the internet is revolutionising both the way many companies work and their relationships with customers – altering forever the underlying value chains. We believe that the prevailing valuations in many sectors do not fully discount the impact of the internet, on both the upside and the downside.

Deconstruction: a new strategy paradigm

The vertical integration value chain is being broken up by the internet

Since the late nineteenth century, the winning value creation model has been vertical integration. A century later, we are seeing the "deconstruction" of these value chains as market forces undermine the business culture upon which many of the world's biggest companies are built. The traditional barriers between trades, companies, and entire industries are falling fast. Hence the search for radical new strategies and organisational models.

Value chains are being snapped…

Even the most formidable barriers to entry, and competitive advantages…

Vertical integration has created riches for countless entrepreneurs. Finely-tuned management structures have been developed to steer increasingly complex businesses, and to tap economies of scale and intra-group synergies. The sheer cost of building a vertically integrated business has proved a formidable barrier to entry in many areas, often translating into equally formidable competitive advantages. Until now that is.

…cannot withstand globalisation, deregulation…

After more than a century, mighty forces are demolishing the vertical integration model. Globalisation and deregulation alone mean that new, often more exacting economic performance measures are being applied to each step in the value creation chain.

…by the growth of the digital economy

…and the digital economy

The most powerful catalyst for change, however, is the information revolution. Information exchange was the cement that held the vertical integration value chain together. Such was the cost and complexity of maintaining a rich data flow between suppliers, distributors and clients that, until very recently, big and small corporates alike had little choice but to tie-up considerable sums in information technology, and carry these resources on their books.

Exchanging and seeking information has never been cheaper or easier…

The advent of the World Wide Web and global communication standards has created a whole new ball game. Open system architecture makes it possible to exchange any type of data instantly, from anywhere in the world, all at very low cost. It has never been easier or cheaper to seek and exchange information.

Raw numbers, supply chain information and even highly-complex design data now flow fluently between corporates, their employees, clients and suppliers. At the same time, the data market has become more efficient, with the emergence of new carriers competing with the traditional national carriers (eg, PPTs) on price and performance.

…impacting corporates internally and externally

This development is impacting existing systems at two levels: (1) corporate systems developed in-house are under increasing pressure from third-party solutions; (2) data flows between clients and suppliers are not only faster and more frequent, but richer than ever.

So what is emerging in the place of the vertically integrated model? A new breed of highly flexible organisational tools.

The vectors of change: the orchestrator and the navigator

The information revolution has fostered the emergence of a new breed of company. They offer intelligence rather than the nuts and bolts of supply chains, and many compete directly with long-established traditional players, often with remarkable success. Typically, these newcomers operate either as an “orchestrator” or as a “navigator”:

- **An orchestrator acts as a bridge between customers and contractors. Leveraging strong brands, they collect most of the value-added but invest relatively little in assets. Nike, Hewlett-Packard and Sara Lee fit this description well.**
- **Navigators help their clients to manage complex supply and demand chains by supplying them with rich data and state-of-the art comparison tools.**

What are the implications of deconstruction?

The deconstruction of the vertical value chain is having a profound impact on the competitive environment. In today’s world, however rational they may be, those who think traditionally risk oblivion.

A whole new competitive environment

Weakness at any level is now far more likely to be spotted and exploited by a competitor

Many corporates still measure their competitiveness as a whole, taking an average of their positions at each step in the value chain. In the new world, such an approach could (and has) proved fatal, as ignoring weakness at any point in the chain could let in a competitor.

Focus on a single sector may have had its day

At the same time, horizontal strategies which exploit opportunities across sectors are increasingly replacing the single-sector models.

Suppliers are no longer protected by inefficient data distribution

Finally, consumer power is growing as "navigators" facilitate access to increasingly rich content, correcting an historical imbalance in data access that favoured the supplier. Identifying the best price for a given product has never been easier.

All is not lost for traditional players

However, all is not lost for the traditional players. While newcomers are a real threat, the web can also be a tremendous opportunity for established players to leverage their historic skills differently.

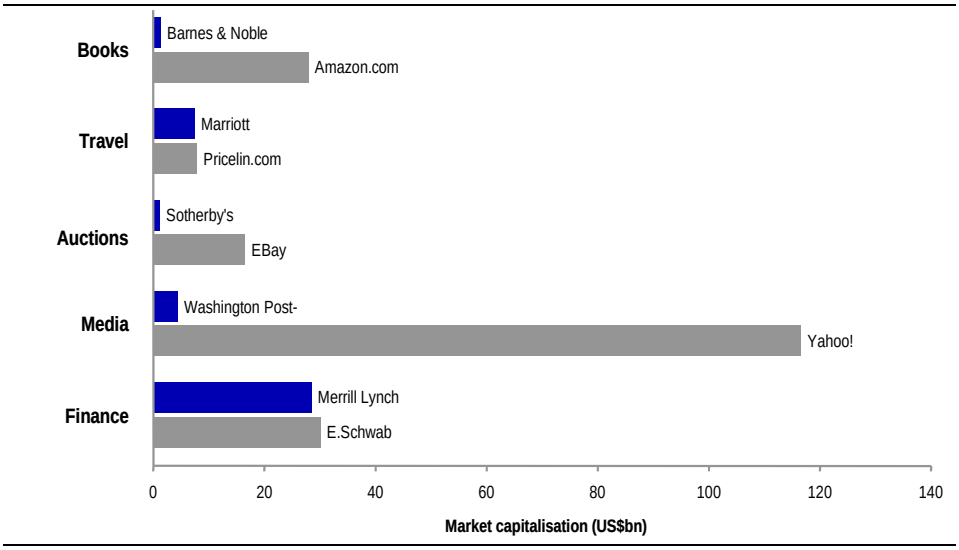
The market has anticipated this migration and rewarded the trend setters

The stockmarket, venture capitalists and private investors are all allocating an increasing amount of time and capital to the internet. As a result, considerable resources have been switched out of smokestack industries and into the internet. In some instances, the migration of value has been dramatic:

- **In January 1999, Excite was sold to AOL for US$6.7bn. In the same month, Ford paid US$6bn for Volvo.**
- **Listed in the spring of 1995, the number one search engine, Yahoo!, now has a market capitalisation of around US$116.6bn, and paid US$4.5bn in January 1999 for Geocities (community site).**
- **Internet access and service provider AOL paid US$4.2bn for the navigator Netscape in late 1998.**

As the following graph illustrates, in many sectors, internet players attract far higher valuations than their traditional brethren.

The migration of value to internet players



Source: WDR - Datastream

Even if valuations fell by 50%, the implicit value creation in recent years would still be dramatic

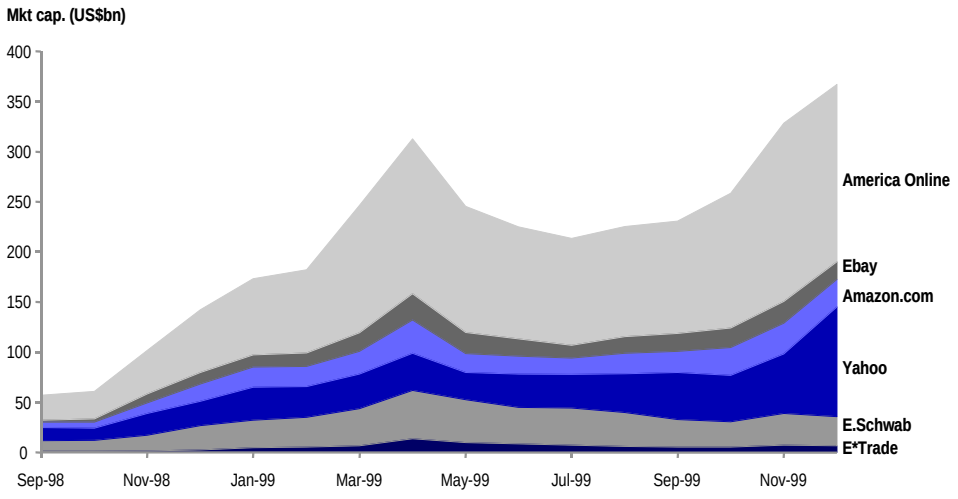
Not surprisingly, many market watchers perceive a serious risk in the gap between the "sky high" valuations of e-players and their tangible results. But while there may be good grounds to sound the alarm, even if valuations were cut in half, the implicit value creation would still be extraordinary.

By channelling funds into the development of the internet, investors are accelerating the migration of value

Investing in the future

Rather than a reward for past successes, the flow of funds into internet stocks can be considered as financing for future projects. Quite simply, investors are prepared to pay now for future value creation. The market is confident that this value will materialise, and is therefore happy to back companies in the vanguard of the internet revolution.

Internet Top 6: threefold rise in market cap. in just one year



Source: WDR - Datastream

In many ways, investors are the most important customers of internet start-ups

The substantial funds put at the disposal of these young companies allows them not only to carry (often hefty) operating losses but also to pursue fast-track growth through M&A. Prime examples are AOL (access), Cisco (web hardware) and Qwest (on-line telecom operator). In many ways, the most important customers of these companies are not the users who sign up for their services, but the investors who are buying a share in their future profits.

The internet is still in its infancy...

We believe much of the internet's potential remains to be exploited, with several factors set to put growth onto an even higher plane:

- **Universal access:** The almost constant fall in the price of access devices (PCs, web TV, palmtops, etc), not to mention the subsidies commonly offered by service providers, promises to make the internet a truly mass-market phenomenon.
- **Better access:** ADSL modems (which dramatically accelerate data flows over traditional copper telephone wires) and cable access are fostering the convergence of the telecoms, IT and media markets.
- **Ever richer services and content:** Originally an all-text medium, the web is now a powerful sound and vision medium. Remarkably easy to use, these tools have made the internet a new forum for the creative arts.
- **Personalised services:** Ever more powerful profiling tools are making it possible to offer tailor-made services to more and more users at next to no incremental cost (in both "push" and "pull" models), opening the door to a new era in relational marketing.
- **The end of "time and distance" metering:** We expect this barrier to fall in the near future. Once down, the internet market should rapidly become truly global. As we understand it, this is one reason why Microsoft has been buying up cable operators. As a rule, the latter already offer flat rate internet access regardless of connection time or distance from the server. As a result, connection rates look bound to fall across the industry. The losers are likely to be the traditional telecom operators. The latter carry hefty structural costs, not just in hardware and networks but also in organisational and operational structures.

The real losers will be those who wait

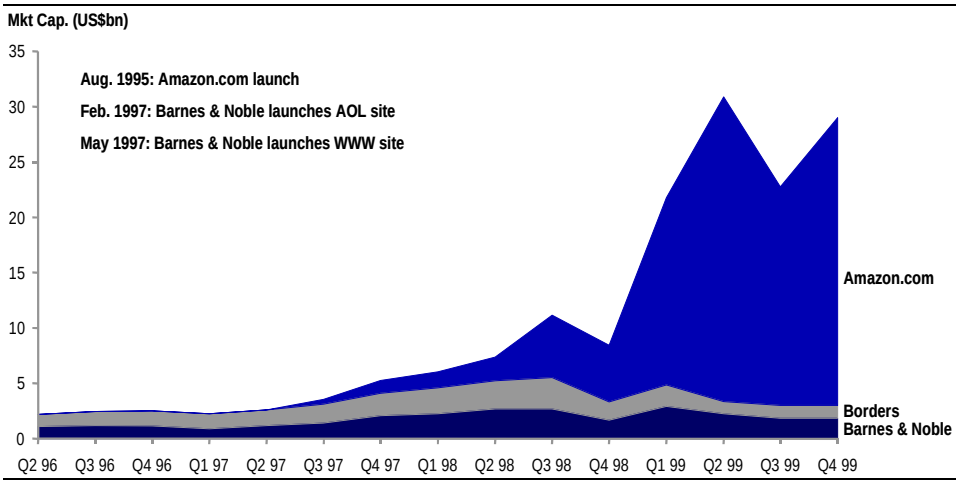
Waiting could prove fatal

Given that the financial markets have already largely anticipated the growth of the web, and that many growth drivers have yet to be fully exploited, timing is primordial; the value usually goes to the first mover, unless its rivals respond immediately. The examples of Barnes & Noble and Charles Schwab illustrate this point well.

Value goes to the first mover...

By the time Barnes & Noble got wired 18 months later, Amazon.com had established what still looks to be an unassailable lead in on-line book retailing. Thus all the e-value went to Amazon.com, which now has a market capitalisation of US$27.6bn, ten times greater than Barnes & Noble.

The e-value has gone to the newcomer Amazon

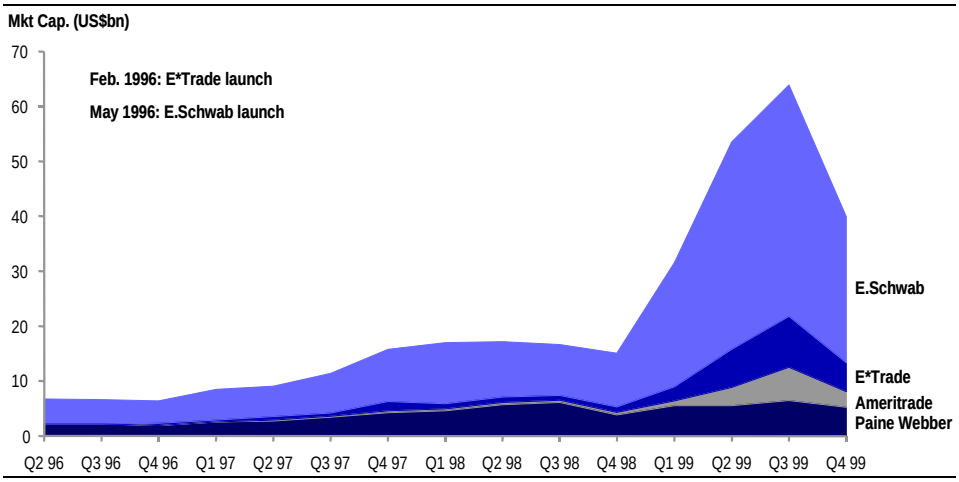


Source: WDR - Datastream

... unless a traditional player responds fast

Brokers Charles Schwab managed to get its E.Schwab trading site up and running just three months after E*Trade went live. Subsequently, such factors as a richer service persuaded the market to allocate the "e-value" to the "old timer" rather than the newcomer, as illustrated in the following chart.

"Old timer" Charles Schwab managed to grab the e-value in brokerage



Source : WDR - Datastream

How to make money from the internet?

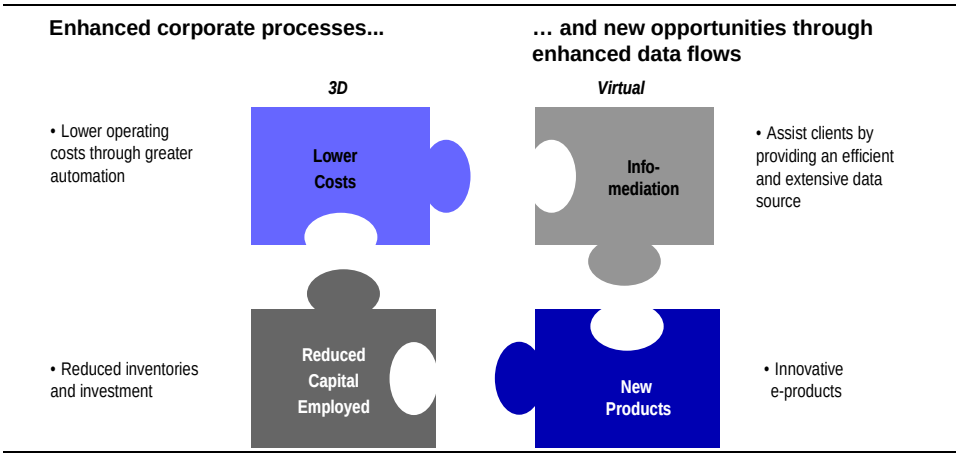
Pulling the e-levers

The internet is both a threat and an opportunity for off-line industries

Whatever the sector, region or market, the internet is both a threat and an opportunity for off-line industries. Most major corporations are now at a crossroads: either they take a defensive stance to protect their value, or they seize the opportunities offered by web. Corporates that do get wired can:

- **Reduce costs by optimising processes;**
- **and/or create value by enriching their offer.**

E-conomic levers



Source: WDR

1. Reducing costs by optimising processes

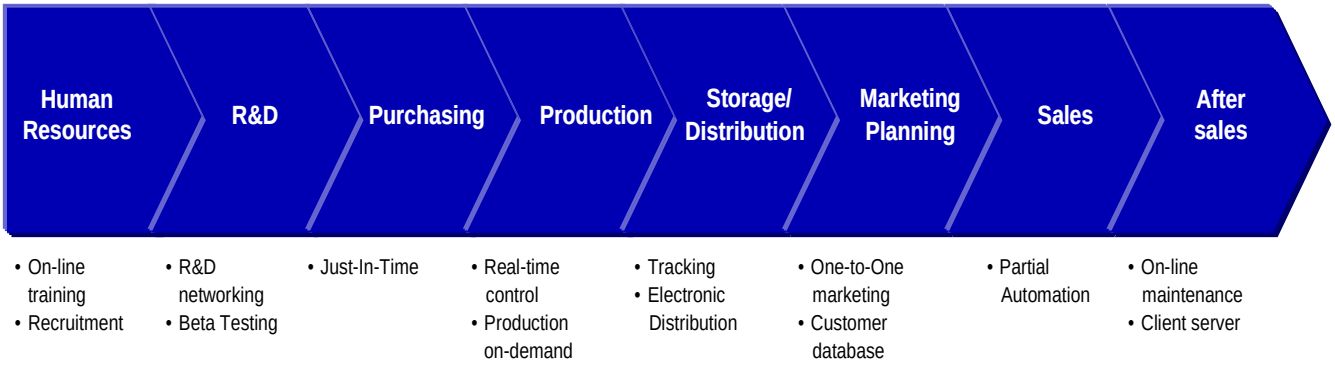
For physical procedures, case studies show that the greater the use of the internet throughout the corporate value chain, the greater the savings.

- **Costs can be cut through greater automation;**
- **and/or reduced working capital.**

Automation

Many corporates went down this path long before the advent of the net, and are well aware of the savings to be had and the work involved. Automation rarely requires a complete rework of the business model. Introducing the net into the equation requires a thorough analysis of existing processes, but not the reconfiguration of the value chain.

Optimising physical procedures without altering the value chain



Source: WDR

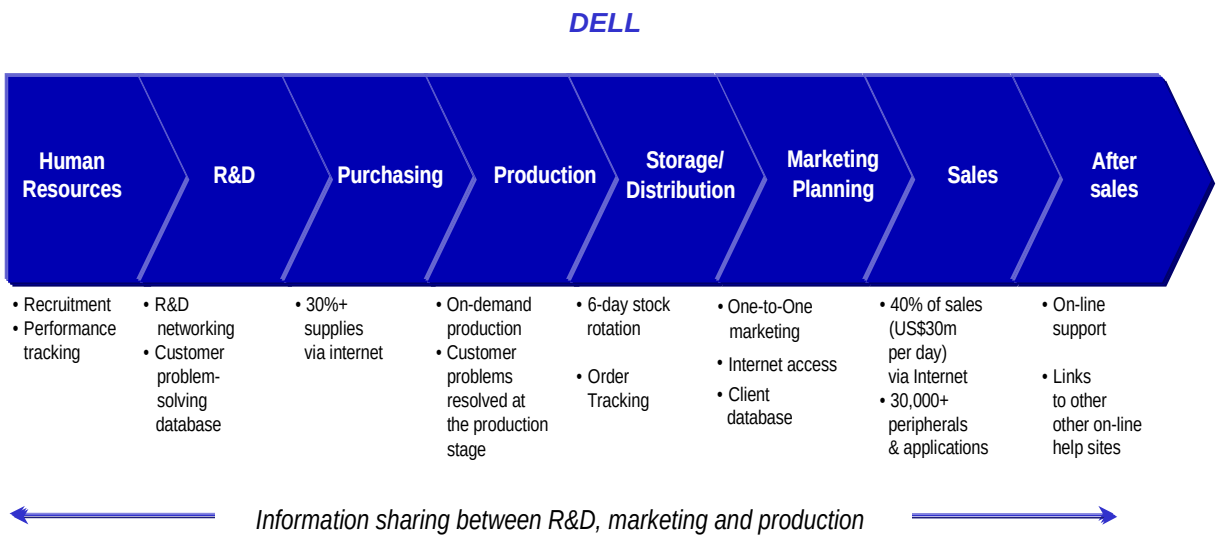
- **Product development:** Ford has cut the time it takes to develop a new vehicle from five to two years by improving data flows and introducing a web-based global project management system.
- **Purchasing:** General Electric (GE) created a web site in 1997 as a hub for its purchasing activities. Not only has this automated the buying process, it has also greatly extended the sourcing network by allowing listed and non-listed suppliers alike to put in tenders. In a typical year, GE expects to make US$1.5bn of purchases through the net. According to the company, this channel generated a 10-15% saving at the "cost of goods" level in 1998 and a 30% saving at the "purchasing costs" level.
- **Administrative:** telephone operator USWest is saving some US$30m annually through the investment of less than US$2m in the net, notably by reducing billing time per line from ten minutes to two minutes.
- **Customer services:** FedEx has moved most of its client services onto the web, including a live package tracking facility and a "frequently asked questions" service. This greatly improved service is yielding annual savings of US$100m, according to the company.

Achieving negative working capital: first re-jig the business model

Using the web as a tool for pushing the working capital requirement into negative territory is a delicate operation as it requires a complete redesign of the business model. In most cases, this entails the outsourcing of a number of business functions, followed by a fundamental change in the way the corporation works with its suppliers and customers.

If successful, this process results in a shift from a conventional 3D procedure-based organisation to a digitised organisation of which the lifeblood is the flow of information.

The web as a tool for creating a digital enterprise



Source: WDR - Dell

Dell and Amazon are the most advanced examples of the digital enterprise.

- In a typical year, **Dell** rings up over US$3.5bn in sales over the internet. Building on this momentum, the company has completely revamped its business model, and is now able to assemble PCs to customers' specifications within five days of order reception. Inventory rotation has reached 52x pa as a result, compared to 13.5x for Compaq and 9.8x for IBM. Dell is paid by customers on average eight days before it has to settle with suppliers, generating positive cash flow that rises in line with sales growth.
- **Amazon.com** pursues a similar strategy, carrying 17 days' stock compared to 213 days' at Barnes & Noble, while offering over three million titles versus 175,000. Initially, Amazon.com invested US$20m in its web site, compared to Barnes & Noble's US$2.6bn asset base (mostly bricks and mortar). In capital intensity terms (ie, the capital employed to generate US$1 in sales), Barnes & Noble stands at US$1.5 versus -2 cents for Amazon.

2. The internet as a tool for enriching products

Beyond cost reductions and reduced working capital, the internet can create value through:

- **Info-mediation;**
- **and/or the creation of new products.**

Info-mediation

This new step in the value chain entails the enrichment of relationships with customers by supplying them with valuable information.

More than simply creating a new source of information, the trick is to ensure customers get the exact data they need with relatively little hassle, and in some cases even pinpoint a need they did not know they had.

Often known only for their internet portals, corporates that pursue this strategy typically focus first on building a large base of regular users:

1. **By offering basic functions, known as the "six Cs";**

The "six Cs"

Need	"Six Cs"	Offer	Example
Information/Entertainment	Context	Search engine	Yahoo !
	Content	Information (voice, data, image)	Wallstreet.com
Contact	Community	Personal web-pages, on-line chat	Tripod
	Communication	e-mail	Hotmail
	Connectivity	Access and bandwidth	@Home
Buy/Sell	Commerce	On-line catalogue and transaction platform	Amazon.com

Source: WDR

2. **By building an on-line community to extend the range of functions across the "six Cs", either through a horizontal strategy;**

Horizontal portals: across the "six Cs" through acquisitions and alliances

Portal	Context	Content	Community	Communication	Connectivity	Commerce
AOL	AOL Netfind	ABCNews.com	AOL Digital City	ICQ	Cegetel	Amazon.com
	Internet Explorer	Bloomberg	AOL	Instant Messenger	Sprint	Preview Travel
	NetCenter	Oxygen Media	News Group		UUNet	Unilever
Lycos	WhoWhere	Billboard on-line	Angelfire	Hotmail	AT&T WorldNet	Bidder's Edge
	Wired Digital	Boston.com	Guestline	iName	British Telecom	Cdnow
	WiseWire	IVillage	Tripod	MailCity		eToys
@home	NetCenter	Disney	Excite Communities	Software.com	AT&T Worldnet	Amazon.com
	webCrawler	Wired			Telecom Italia	American Airlines
		SportsLine USA			@Home	BankOne
Infoseek	Infoseek	ABC	280	GlobeComm	AT&T Worldnet	Apartments.com
		CNNfn	WBS	Guestworld		Autobytel
		ESPN.com		MaiCity		Borders On-line
Yahoo !	Inktoni	Associated Press	Yahoo! Chat,	Yahoo! Mail	AT&T WorldNet	CarPoint
		Fox Sports On-line	Geocities	Yahoo! Pager	British Telecom	CDNow
		TV Guide				SABRE

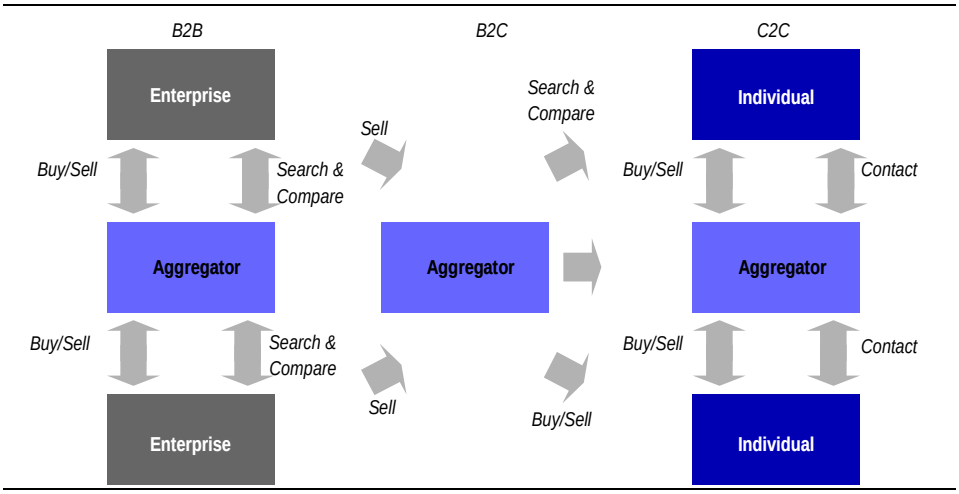
Source :WDR

3. **or by adopting a vertical strategy of offering a range of functions based on a single theme (eg, cars) or community (eg, home owners).**

- **Info-mediation and the car industry:** The Autobytel network in the US has revolutionised the relationship between customers and car dealers, not only by making the market more efficient (excellent tool for matching supply and demand) but also by offering a one-stop site for car buyers (finance, insurance, etc) complete with comparison tools. Autobytel more than covers its costs by saving an estimated US$80m in bricks and mortar dealership expenses.
- **Info-mediation and financial services:** Get Smart offers loan finder and credit services. The site hosts more than 700 products supported by over 100 salesmen offering more than 15,000 loan deals. Interactive tools guide customers to the loan service that best matches their criteria. Not only does this build a high-value, data rich client base, it also earns brokerage fees for Get Smart.

4. By offering one-to-one services; business-to-business (B2B), business-to-consumer (B2C), consumer-to-consumer (C2C).

The three info-mediation zones



Source: WDR

5. While tapping into more revenue streams.

Three revenue models

Revenue	Costs	Issues	Example
Subscriptions and/ or interconnection	Substantial infrastructure cost User acquisition	Commoditisation Vulnerable to free ISP model	AOL
Advertising/ sponsorship	Branding driven by the need to build up loyal user base Content management User acquisition	Low barriers to entry Intense competition to attract & retain users Limited revenue opportunity	Yahoo!
Transaction	Attracting customers Infrastructure Customer service	Customer education Security and fraud fears Established brands	e-Bay

Source: WDR

New products

Many new products developed for the web draw on the internet's micro-segmentation potential, ie, the ability to tailor products to a customer's specific needs at the same cost as a standard product. So far, however, there are few good examples.

- **Choose your own Barbie:** Mattel's site allows customers to select clothes and features for a Barbie doll and view changes on screen before placing orders. Over 24,000 combinations of expression, eye colour, hair, clothing, etc., are available. The drawback is price, at three time the high street rate for a standard doll – reflecting the fact that the rest of the Mattel value chain has yet to be digitised.
- **Customised credit cards:** Next Card has reinvented the credit card business model, tailoring its service to each client's profile. Based on specialist marketing techniques conceived for the internet, the site has managed to capture a 20% share of the on-line credit market in the US. Moreover, all this has been achieved at dramatically

lower costs (eg, invoicing costs have been halved) and a much reduced, or indeed negative, working capital requirement (no bricks and mortar agencies).

- **On-line share trading:** both E*Trade and E.Schwab offer individuals a real-time stock trading service, effectively ending the monopoly of professional brokers.

Pulling these e-levers, however, condemns corporates and investors to live in a universe governed by Heisenberg's principle.

Living with Heisenberg's uncertainty principle

"The more precisely the POSITION is determined, the less precisely the MOMENTUM is known in this instant, and vice versa".

The internet-triggered technological revolution is already having profound impact on the business world. Not least, the net can fundamentally change relationships with customers. In light of this, we believe it is imperative that the majority of businesses, however well-established, reconsider every single aspect of their business model with the web in mind.

The web can shift the balance of power between supplier and customer in favour of the customer

By successfully negotiating the passage from a conventional structure to a digitised model, corporates can reap the benefits of mass micro-segmentation. As we have seen, this generally means reorganising production and data flows to allow customers to "pick n' mix" product specifications. The catch is that this shifts the balance of power between supplier and customer in favour of the customer. Not only does this threaten to wipe out organisations that fail to keep up with the pace, it means the days of product standardisation are over.

Our maxim is "nothing is certain, but everything is probable"

There are, however, real risks in even the most successful e-business. Not least, the management must operate without the certainties that have prevailed in the business world for the last hundred years or so.

In this respect, the post-internet business world appears to have more in common with fuzzy quantum mechanics than the snug model it is superseding: probabilities can be asserted about space, only one variable can be precisely measured at a time, and action is indissociable from observation.

A whole new paradigm

With none of the certainties of the 20th century…

In such an unstable universe: (1) risk management (eg, the evaluation of manpower needs and the appropriate financial resources with zero visibility) is more important than a detailed business plan; (2) close observation is more important than careful research: (3) responsiveness prevails over the ability to forecast.

…better to learn by trial and error

Trying to answer all the questions thrown up by this new paradigm would take an inordinate amount of time. In such a situation, we believe it is best to learn through doing, and forge a strategy through experience.

But that does not mean a good strategy can be dispensed with

Nevertheless, a good strategy is indispensable in the world of e-commerce -perhaps more so than in any other area of business. However, this market is and, in our view, will remain a "moving target". As such, Heisenberg's principle looks apt, in that the boundaries of what is possible can only be guessed at, and observation alone can tell us where we are.

Gauging e-value requires a new approach

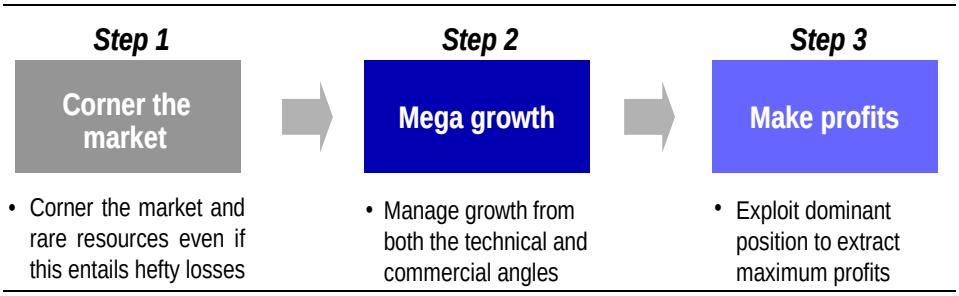
Apart from the usual effort to ascertain whether the right economic levers are being pulled, and the appropriate business model pursued, in our view any attempt to gauge e-value must take into account several brand new axioms;

1) **An e-business grows sequentially in three steps, and steps one and two are critical;**
2) **No market position is strong enough to last without permanent reinvention;**
3) **To reap the full benefits of the internet, players must think like new entrants even after years in business.**

Three steps to growth

Our retrospective research shows that a new growth paradigm is behind every successful e-strategy: (1) corner the market by seizing scarce resources; (2) manage mega-growth; (3) transform some market share into profit.

The new three-step growth paradigm



Source: WDR

Step one: corner the market and rare resources

Almost without exception, the biggest winners on the internet so far have begun by: (1) rapidly building a broad client base; (2) establishing a strong brand by assiduously pursuing client relationships; (3) building excellent relationships with suppliers (even to the extent of buying exclusivity); (4) going for an IPO at a relatively early stage of their development; (5) and, last but not least, hiring the best talent around.

The best examples of the "step one" process have been in the US.

- In its early days, AOL concentrated on signing up as many subscribers as it could, not least by slashing prices and offering highly competitive fixed rate packages. To generate "clicks", it was prepared to pay premium prices for the rights to popular, high profile content.

- Autobytel's first shot was to forge partnerships with one in eight US car dealerships.
- Early on, Amazon.com focused on building a database detailing customers' purchases, and now mines this rich data to fine tune its marketing effort.
- MovieLink's first move was to acquire the on-line ticketing rights to 19,000 cinema screens.

As these examples demonstrate, today's biggest players began by concentrating on building market position almost irrespective of the expense (and subsequent losses). Turning an apparently blind eye to the financials, they went all out to capture rare resources in the shape of subscribers, content, rights, etc.

Step two: managing exponential growth

However well prepared for, rapid growth brings its own risks

As subscriber numbers rise exponentially, a period of ultra-rapid growth is inherent in the internet paradigm. Nevertheless, no matter how many rare resources have been captured, internet players are vulnerable during the growth stage, in particular to copycats. A young site must grow not only to exploit its market, but quite simply to survive.

Rising demand must be met efficiently

As a rule, players that survive this stage have the acumen to build both a solid technical base and a commercial network to handle a huge surge in demand. Adequate financial and human resources are also a prerequisite.

Beating the competition at this stage can lead to huge rewards

It is often at this point that the big winners have emerged. For example, AOL beat off competition from rival portals offered by Compuserve, MSN and AT&T during this stage of its development. AOL now has some twenty million subscribers worldwide, who spend an estimated 75% of their on-line time using its portal.

Step three: make a profit

Having built a dominant market share, the next step is to leverage this into profits. There are several ways of doing this:

- **A swing in negotiating power away from suppliers can be leveraged into better purchasing terms.**
- **A large customer base and a high "hit rate" can be used as bait to attract fresh content and to tap new streams of income.**
- **More generally, a leading market share can be leveraged into higher margins.**

Once again, AOL is a textbook case. A number of content providers who were charging AOL for their services several years ago are now paying to access its subscriber base. AOL earned US$1bn from selling htlm-link advertising alone in 1999.

Beyond step three: permanent reinvention...or die!

It would be foolish to claim that there is little risk in an internet company that makes it to step three. In our view, no position is unassailable without constant innovation to build on the first big idea. In short, today's leaders must invent new business models which complement or even replace the original. There are already several examples of this process:

- **At Home** began life as a proprietary network access provider based on what was then new cable modem technology. Next, it transformed itself in an internet service provider to nurture direct relationships with users. By creating an internet portal, it was then able to leverage the attractions of its reliable and high-speed network to attract fee-paying content providers. More recently, At Home has became a content provider in its own right.
- Having reached step three, **AOL** added three applications to its initial portal offer - instant messaging, chat and e-mail – which now generate 50% of traffic. It then leveraged its dominant position to turn non-exclusive deals with its partners into exclusive ones. More recently, it took control of rival portal Netscape to expand its client base, and acquired technical expertise in operating systems by forging an alliance with Sun Microsystems. AOL is now poised to move into on-line telephony (AOL Phone) and television (AOL TV).
- **Yahoo!** leveraged its success as a search engine to become the first major portal site. Quick to offer content and services (chat, e-mail, on-line games, etc.), it is now offering personal web pages (My Yahoo!) and e-mail that works from home and the office. Yahoo! is now setting the pace for the rest of the industry, doing everything from selling e-commerce software to providing on-line banking, telephone and travel services.

Can traditional corporates live with the new growth paradigm?

Breaking all the moulds

New market, new companies

Why is it that the most successful internet companies were all founded only a few years ago? And how come so many long-established and very bright corporates have missed the opportunity to tap into the value-creating power of the internet? A close look at the history of successful internet companies that have exploited ground-breaking technology brings to light two phenomena:

- Only rarely do established companies lead the way in new technology businesses. We believe this failure reflects a lack of interest in (or the lack of attraction of) the small but emerging markets that often serve as testbeds for new services. Moreover, the big companies are often the last to deploy new ideas, frequently because they greatly fear cannibalisation of their existing products and potential conflicts with long-standing partners.
- Several start-ups have become major players after developing their products and services in niche markets, before turning their sights on the main market.

Amazon.com is a good example of how a start-up can leave a long-established company in its

The US book industry provides a good example of a start-up leaving a long-established market leader in its wake. By the time Barnes & Noble (founded in the nineteenth century) got wired, Amazon.com (founded in the last decade) had established what still looks to be an unassailable lead in on-line book retailing. Thus, as we have seen, most of the e-value has gone to Amazon.com.

But some long-established players have been first movers on the web

Nevertheless, there are cases of an established leader stealing the initiative on the net and thus grabbing a lot of the e-value for itself. The pioneer discount broker Charles Schwab (founded 1974) is a good example.

Traditional should think like start-ups and make the most of their existing assets

The challenge for young companies is to stay young

However long a company has been established, we believe that the best strategy for the internet is to think and act like a start-up at all times –which is easier said than done. Given the constant change in the "Heisenberg" marketplace, any company with real ambitions for the net has to permanently live with a high degree of risk and uncertainty.

In this context, it is perhaps wise for even the most established player to begin with projects that entail modest initial unit costs (not too difficult with new technology) and then ramp up investment as success grows. For internet start-ups, rapid deployment and results analysis, in our view, are far more important than a rigorous business plan.

The challenge for old companies is to leverage their existing structures into on-line services

In addition, traditional players would be advised to make the most of their bricks and mortar assets to develop their e-businesses. Dixon's Freeserve free portal (UK) is a good example, as is PPR's (France) 48-hour on-line ordering service, with deliveries made from the nearest Fnac megastore or La Redoute catalogue warehouse.

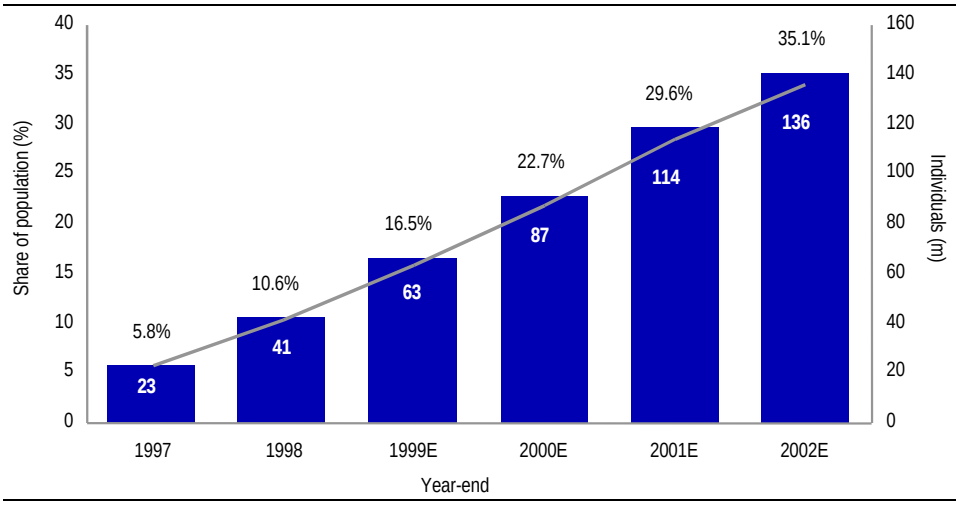
The internet in Europe

How many people are using the web in Europe?

The internet took off in Europe in 1999 and hit the high street

Western Europe experienced tremendous growth in internet usage in 1999. Numerous surveys show that web usage is expanding way beyond small clusters of graduates and hobbyists to much broader segments of the population.

Web users in Western Europe, 1997-2002E



Source: WDR estimates- International Data Corporation (IDC)

Who uses the web?

35% of Europeans by year-end 2002E

Our definition of a "user" is somebody who has logged onto the World Wide Web at least once in the last three months. On this basis, 41 million Europeans could be considered users at year-end 1998. We believe it is reasonable to expect 35% compound annual growth over the next four years, implying no less that 136 million European web users by year-end 2002, or 35% of the entire population.

What is driving growth?

- **Changing attitudes in many European countries**. Resistance to the net appears to be fading fast in the most technologically and economically advanced nations such as Germany and France.
- **Mass media attention**. Web sites are now key features in many print and TV advertisements for consumer goods and services, especially in early-adopter areas such as the Nordic region and the UK. Even in less web-advanced countries, web-sites are often featured in TV programs and commercials targeted at young people.
- **Extrapolating business growth.** Corporates throughout Western Europe are investing in IT infrastructure, and even the smallest companies are getting connected. In larger organisations, web access is migrating from top and middle management levels into the general workforce.
- **Government sponsorship**. In Scandinavia, the UK and France, various administrations are actively encouraging the growth of educational web access, offering subsidies to companies that give employees home PC access, and have moved key public institutions on-line. We expect European governments to become increasingly sensitive to the on-line requirements of industry and consumers throughout the forecast period.

- **Relative social equality**. We believe the narrower the gap between rich and poor in a given country, the higher the internet penetration rate will be in the long run. For example, the "lowest" social classes in social-democratic countries like Sweden and Germany will probably find it easier to access the web than in equally-advanced nations where the gap between rich and poor is wider, such as the United States.

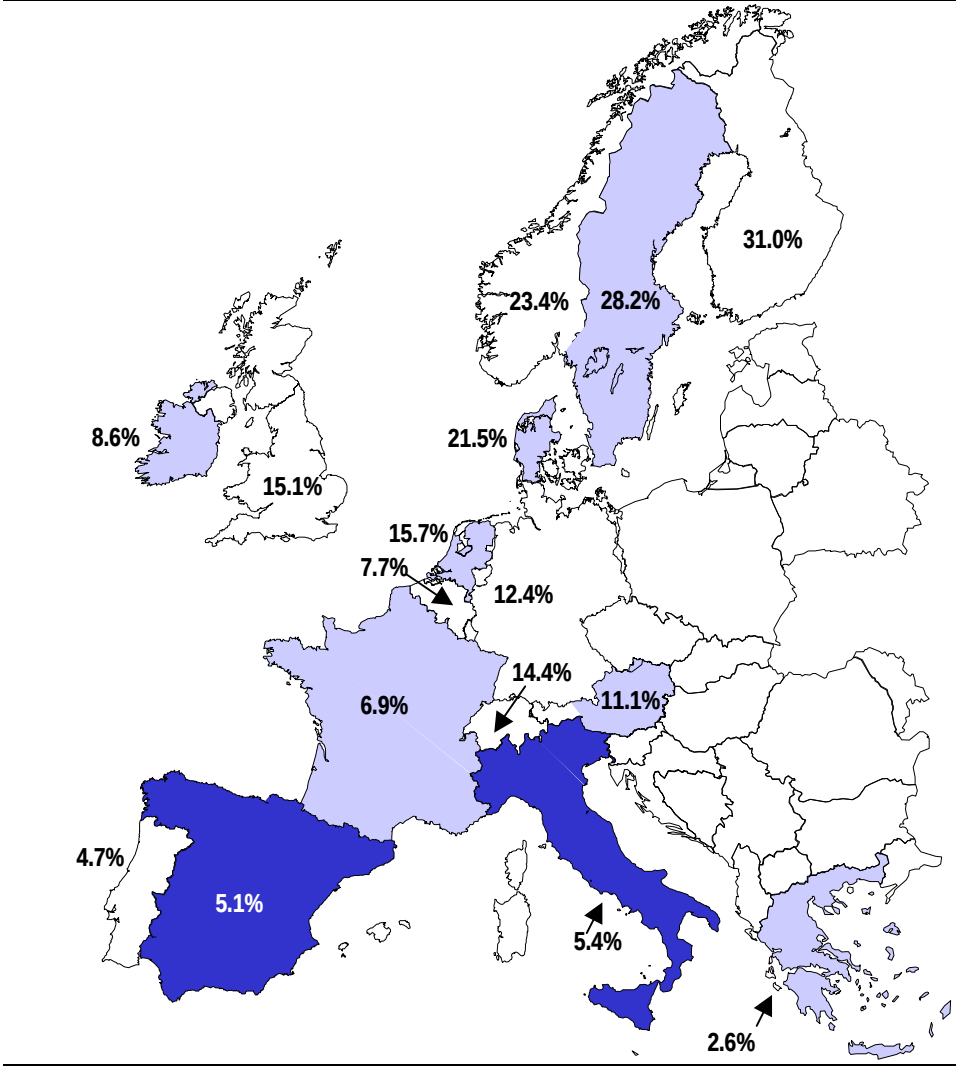
Unequal growth across Europe

Given the considerable differences between Western European countries in terms of internet usage, we believe it is worthwhile looking at trends country by country.

2.6% penetration in Greece, 31% in Finland

The most important measurement, in our view, is web penetration. The lowest web penetration rate is found in Greece, where only 2.6% of the population were connected at end 1998 compared to 31% in the leading country, Finland.

Web users as share of population (YE 98): north to the fore



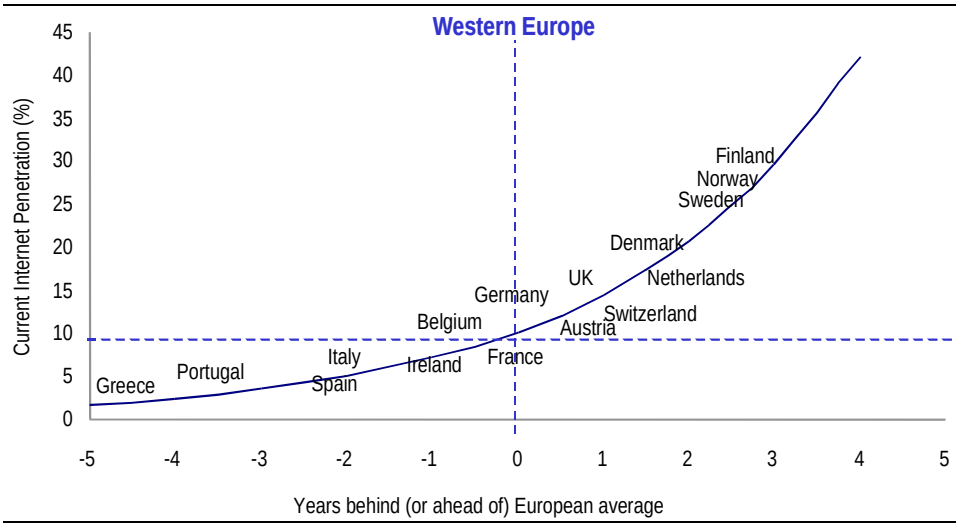
Source: WDR, IDC

The further north you travel, the greater the penetration rate

As the map highlights, penetration rates are much higher in Northern Europe. Taking a closer look, we see interesting differences between countries that can otherwise be considered equal in economic and technological terms. In Sweden, for instance, the chance of meeting a web user is twice as high as in Germany. At the same time, there are twice as many web users in Germany than in France in relative terms.

Another interesting approach to measuring web penetration is IDC's timeline matrix (see following chart), which shows which countries are ahead of the pack and which are trailing behind.

IDC time-line: south clearly trails the north



Source: WDR-IDC

Three years before the Western European average catches up with Finland

We see that it is likely to take, say, Belgium four years to catch up with Finland in terms of web usage. By the same measure, Western Europe on average should take three years to catch up with Finland.

In penetration terms, we expect France and Germany to close the gap more rapidly…

The chart also shows that Germany and France have been slow to adopt the web in spite of high economic and technological standards. We expect these countries to catch up fast with the more advanced nations now that web usage is taking off in earnest.

…while Germany and the UK already dominate in absolute terms

Even though local penetration rates are still way behind those of the Nordic countries, in absolute terms Germany and the UK have the largest internet populations, and are home to almost 50% of all Western Europeans. As for the Nordic countries, they represent 16% of all current users, almost as many as Italy and France combined.

Web users by country, 1998-02E

Web users (million)	Year-end 1998	Year-end 2002E	CAGR 98-02E
Germany	10.3	32.9	34%
UK	8.9	23.0	27%
France	4.0	23.0	54%
Italy	3.1	13.3	44%
Sweden	2.5	5.7	23%
Netherlands	2.5	7.6	32%
Spain	2.0	8.4	43%
Finland	1.6	2.8	15%
Denmark	1.1	2.5	22%
Switzerland	1.1	3.2	33%
Norway	1.0	2.2	21%
Austria	0.9	3.1	36%
Belgium	0.8	3.4	43%
Portugal	0.5	2.1	46%
Ireland	0.3	1.1	37%
Greece	0.3	1.4	51%
Total	41	136	35%

Source: WDR estimates, IDC

Dramatic shifts in the European base ahead

In the next four years, however, we expect some dramatic shifts in the European user base in terms of market share. In relative terms, France and Italy should see the most growth over the next four years.

- **By year-end 2002E, the UK's market share should have retreated to 17% from 22% in 1999;**
- **France and Italy combined should account for approximately 27% of all users, versus 16% at present;**
- **Germany's share should stick at around one in four users;**
- **The Nordic countries' combined share should drop to nearer 10%.**

We believe the marketing community is monitoring these shifts closely with a view to fine-tuning their web strategies.

How many users from home, work and school?

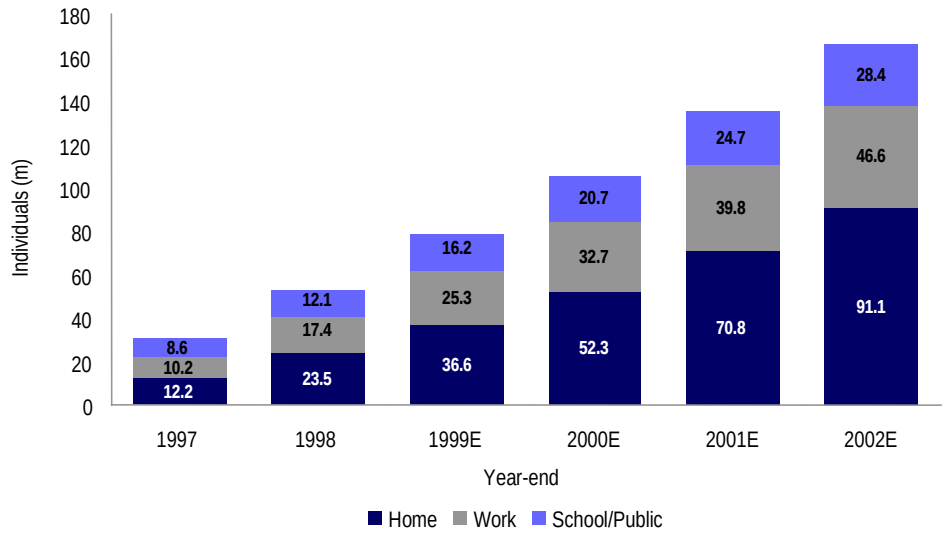
Growth is shifting from education into offices and the home

While the number of school-based users continued to rise in the late 1990s, the real growth is now found in the home and business segments. We note two trends: (1) employee-driven demand for web access is being fulfilled; (2) the potential for home usage remains largely unfulfilled, and this segment could continue to grow long into the new millennium.

57% home, 42% work, 30% educational or public

Across Europe, 57% of web users currently log on from home, 42% from work, and around 30% from an educational institution or a public terminal (eg, in a library or a cyber café). Adding these up yields more than 100% as there is a significant number of people who log on from more than one location.

Home, work and educational/public access 1997-02E



Source: WDR estimates, IDC

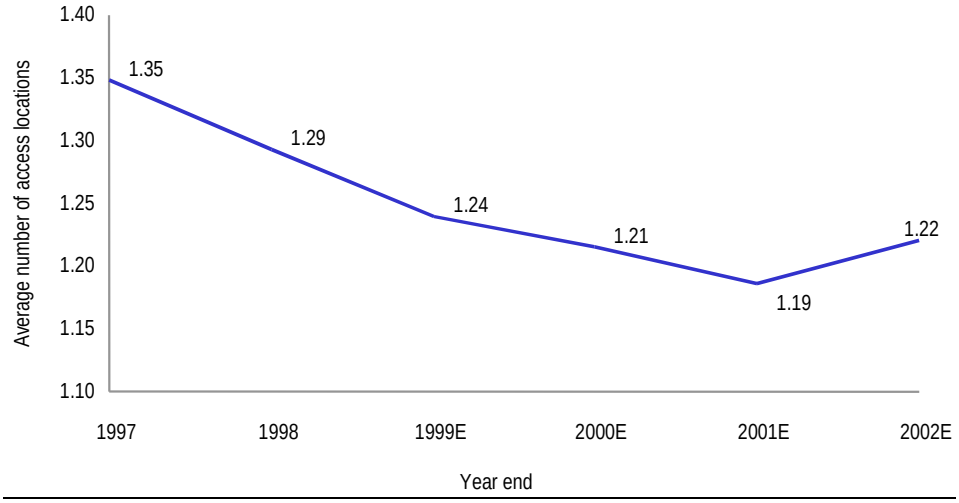
Going forward, we expect home access to predominate. By year-end 2002, the split should be 67% from home, 34% from work and roughly 21% from school. In absolute terms, this implies:

- **91 million home users, or 23% of the Western European population;**
- **47 million office users, or roughly one in four employees;**
- **28 million educational users out of a total c.75 million students (including primary school).**

Multi-access: set to take off in Europe within four years

The location ratio is the average number of access locations to which users have log-on access. Note though that this ratio does not match the number of access points. Users can log on from several different devices at the same location (eg, home TV or PC), but these count only once in the location ratio.

Average number of access locations, Europe 1997-02E



Source: WDR estimates, IDC

Access: school+home, work+home, but rarely home+work+school

The current European location ratio is 1.3, capturing a variety of permutations: (1) 51% of home users are also accessing the web from work or school; (2) 41% of work and school/public users are also logging on from home; (3) a very low percentage of users have access from both work and school or access from all three locations.

High European telecom charges are holding back European location ratios

Access overlap is significantly lower in Europe than in the United States. Not only does this reflect lower PC and internet penetration rates, but higher telecom charges in Europe. Why pay a high charge to log on from home when you have free access from school or work? All in all, we expect the European location ratio:

- **To decrease slightly over the next three years as more people get access for the first time;**
- **To slowly rise from 2002 as the web becomes more commonplace.**

While trends look sure to vary from country to country, we generally expect European location ratios to turn upward on a two to four year horizon.

Usage varies greatly from one country to another

There are noteworthy differences between home, work and school usage patterns from one European country to another.

- **Home usage is more common in early-adopter countries such as Finland, Sweden and the Netherlands. In countries with low web penetration, such as Spain and Portugal, access is predominately from work or school.**
- **The UK numbers reflect a large "wired" student community, and school access is also very common in the Nordic countries and in the Netherlands.**
- **Germany and Austria have relatively few students using the web from educational institutions. Large and medium-sized companies, on the other hand, play an important role in Germany.**
- **Overlap between home, school and work is higher in web-advanced countries.**

Europe: web users by location, 1998-02E

web Users	Year-end 1998			Year-end 2002E			CAGR 98-02E		
(million)	Home	Work	School	Home	Work	School	Home	Work	School
Germany	6.0	4.9	2.31	21.8	12	5.38	38%	25%	24%
UK	5.3	3.85	2.96	15.9	8.5	5.79	31%	22%	18%
France	2.1	1.58	1.24	15.7	6.95	4.7	65%	45%	40%
Italy	1.7	1.25	0.97	8.0	4.46	3.2	48%	37%	35%
Sweden	1.6	1.05	0.77	4.6	1.68	0.96	31%	12%	6%
Netherlands	1.5	0.87	0.92	5.5	2.31	1.58	39%	28%	14%
Spain	1.0	0.91	0.52	4.9	3.13	2.16	48%	36%	43%
Finland	1.0	0.54	0.57	2.1	0.81	0.6	20%	11%	1%
Denmark	0.7	0.4	0.42	1.8	0.84	0.51	28%	20%	5%
Switzerland	0.6	0.45	0.29	2.3	1.22	0.53	39%	28%	16%
Norway	0.6	0.43	0.35	1.6	0.77	0.47	27%	16%	8%
Austria	0.5	0.39	0.21	2.2	1.08	0.55	42%	29%	27%
Belgium	0.5	0.31	0.26	2.4	1.06	0.83	51%	36%	34%
Portugal	0.2	0.22	0.13	1.1	0.88	0.5	54%	41%	40%
Ireland	0.2	0.12	0.09	0.7	0.37	0.27	41%	33%	32%
Greece	0.1	0.12	0.08	0.7	0.55	0.37	55%	46%	47%

Source: WDR estimates, IDC

New devices are set to democratise web access

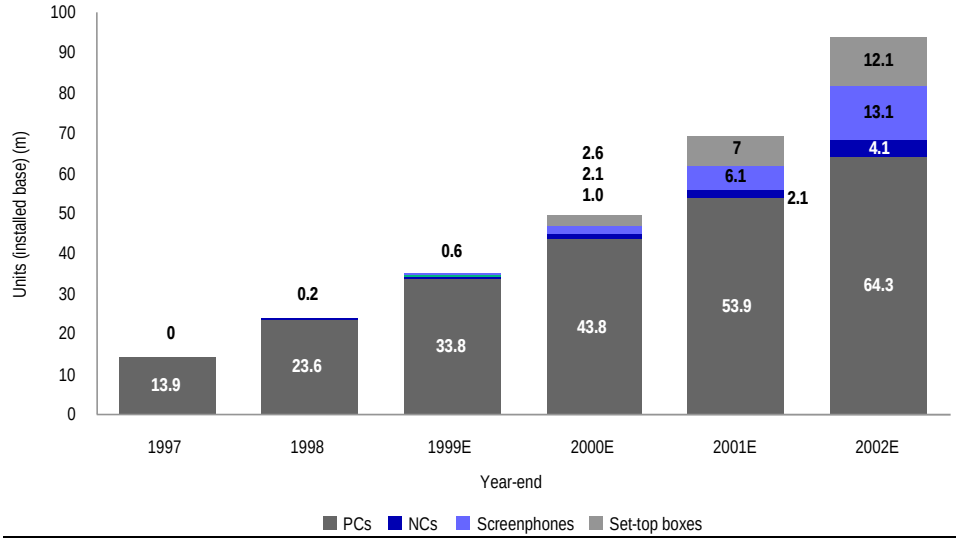
A PC is not the best, or cheapest way to get wired… …hence the development of simpler, inexpensive devices

We believe we are on the brink of a ramp-up in web access device development comparable to historical shifts in other consumer technology (satellite TV technology is a good recent example). A PC is unnecessarily complex and expensive if all you want to do is surf the web. This simple fact is fuelling the development of access devices that are either stand-alone (palm-tops) or add-ons (TV set-top boxes). These relatively inexpensive devices look set to "democratise" web access, especially in countries where PC penetration remains low.

New web devices should have a real impact from 2000 onward

We expect new web access devices to begin having a real impact as of 2000. We forecast a 43% compound annual growth rate in the number of web devices (including PCs) over our forecast period, implying a jump from around 24 million at year-end 1998 to approximately 94 million at year-end 2002.

Web access devices by type, 1997-02E



Source: WDR estimates, IDC

US leads in fixed devices, but Europe leaves the pack standing in mobile access

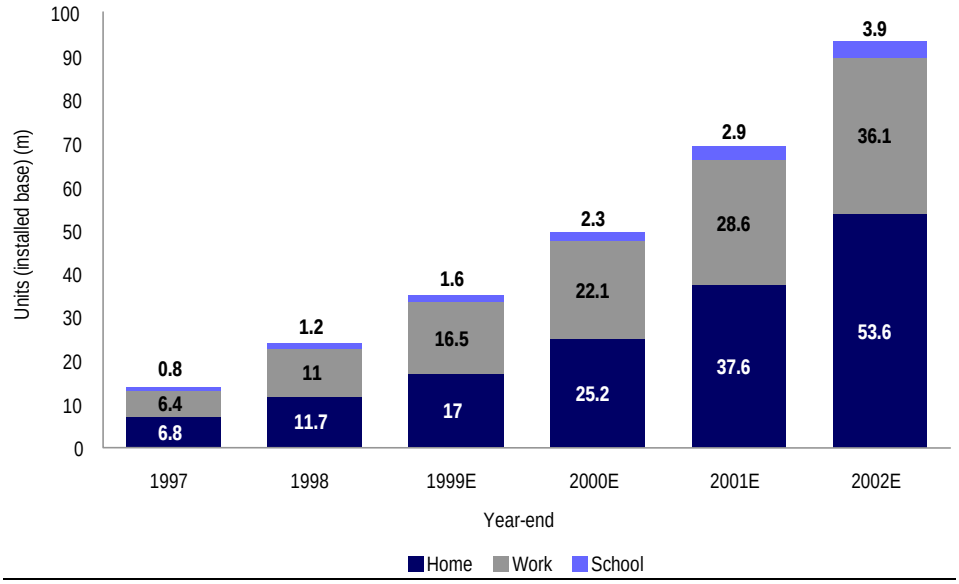
We have divided the fixed web access marketplace into four segments: (1) personal computers; (2) net computers (NCs) and Windows-based terminals; (3) set-top boxes (TV-centric solutions like cable-TV add-on boxes and games devices); (4) and screenphones *à la* France Telcom's Minitel.

While the US is ahead of Europe in fixed penetration, Europe is way ahead of the curve in mobile phone use. Third generation wireless technology (due for roll-out in 2002) that affords far faster internet access is, in our view, set to prompt a substantial rise in the number of web access devices. We expect the European market to surf the crest of this new technology wave.

New generation of on-line devices are ideal for the home...

Inexpensive and easy-to-use alternatives to the PC should ensure that the home remains the prime location for web usage, even if the PC remains the fastest growing business access device.

Web access device by location, 1997-02E



Source: WDR estimates, IDC

Home access: 47% of the market currently, 57% by end 2000E

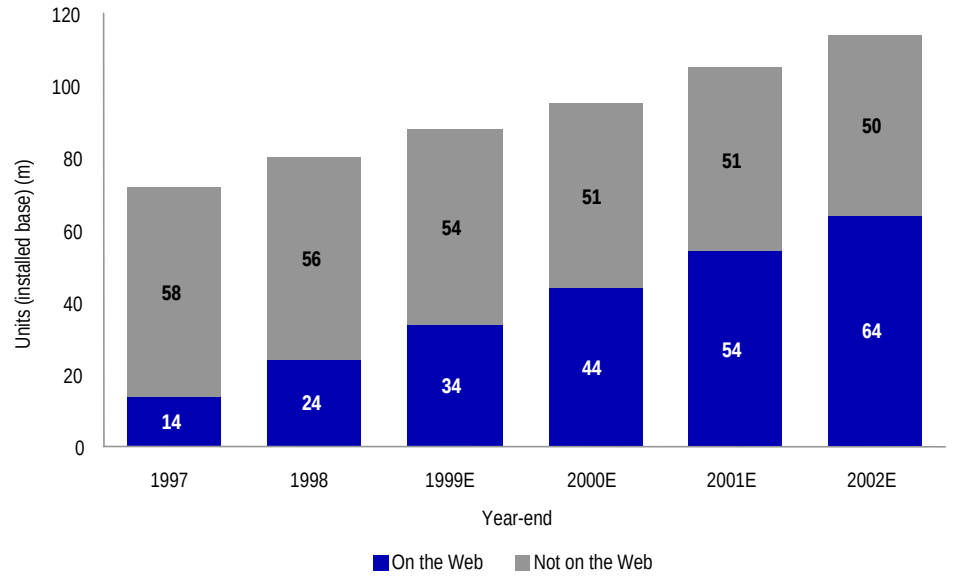
With home access forecast to account for c.60% of demand for all new web devices over the period 1998-02, we expect this segment to capture 57% of the installed base by end 2002 compared to 49% currently.

...but PCs will not disappear

On-line PC base set to double in Europe between 1999 and 2002

In Europe, we expect the proportion of web-enabled PCs to roughly double over the forecast period from 30% at year-end 1998 to 56% by year-end 2002.

On-line PC base, 1997-02E



Source: WDR estimates, IDC

On-line PC growth drivers: new sales, upgrades and replacements

While the total PC installed base is forecast to reach some 114 million units by 2002, the number of PCs without web access looks likely to fall slightly as obsolete PCs (286s, 386s) are discarded. At the same time, most new PCs are now sold complete with modems and internet access applications, and an increasing number of PCs are being retrofitted with modems or being hooked up to the web through a local area network (LAN).

By 2002, however, we believe there could still be some 50 million PCs in Western Europe without web access:

- **There is a relatively large installed base of older PCs that are unsuitable for web applications, especially in homes.**
- **A significant number of European households are likely to get wired by purchasing a set-top box for their TV, and continue to use their PCs, if they have one, for office applications, games, etc.**
- **Key corporate applications should for the most part remain on traditional host-based or client/server systems. Many workers do not need the internet to do their daily tasks.**
- **Many small, low-tech European companies are likely to continue to use the phone, fax and traditional mail as their key communication tools.**

Schools and business in the forefront of on-line PC growth

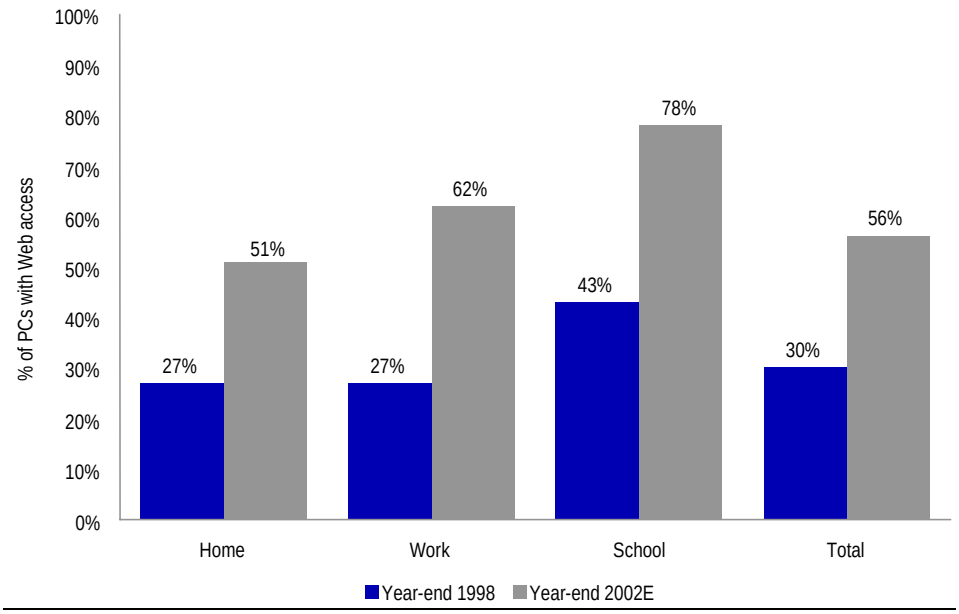
At present there are more on-line PCs in the home than in offices and schools, but this is set to change

Until now, on-line PCs have been more common in homes than in offices. This is partly explained by the fact that individual web access is essentially interest-driven. For instance, many users have hooked-up out of an interest in technology, rather than after making a rational evaluation of the economic benefits of the web.

For many corporates, the web is a further expense on top of already hefty IT spending

In contrast, many corporates that have already invested large sums in IT infrastructures have been reluctant to give their employees web access, preferring to wait until the economic benefits become clear.

PCs with web access by location (1998-02E)



Source: WDR estimates, IDC

Web access took off in earnest in both homes and offices in 1998, and by the end of that year 27% of home PCs and work PCs were on-line. Subsequent growth patterns are likely to be less even, in our view, with more office PCs expected to go on-line than home PCs. On our estimates, some 62% of office PCs should be wired by year-end 2002 versus 51% in homes. We expect corporates and the education segment to be main drivers for this shift.

- Corporates regularly renew their PCs and discard obsolete CPUs, whereas home PCs are often passed on to less demanding users or beginners. Some outdated business PCs may even end up in private homes. Moreover, many corporates are currently investing heavily in web infrastructure, and expect a far higher proportion of their PC base to be on-line going forward.
- Although the education sector, especially at university level, was an early internet adopter in Europe, many classroom and lab PCs below university level are still not connected. However, we expect 78% of educational PCs to be wired by year-end 2002 compared to 43% at present.
- On the downside, if telecommunication costs remain at relatively high levels in Europe, then many European consumers could be dissuaded from connecting from home. An internet connection at work, which is usually shared by many people, is by nature less expensive.

UK and Germany: the highest concentration of web devices

With five to six million devices installed at end 1998, Germany and the UK boast the largest concentration of web devices in Europe. France, The Netherlands, Italy, and Sweden trail far behind in terms of density.

- Germany is on track to dominate the European internet market, in terms of access, by 2002, when the installed web base is forecast to reach to 24 million units.
- On the same horizon, the UK should remain in second place, but at a substantial distance behind Germany with 17.7 million devices.
- In spite of the overall size of its IT market and a high growth rate, France is not expected to catch up with the UK within the forecast period. Approximately 13.5 million web devices should be installed by year-end 2002.

Web access devices by country, 1998-02E

Units (Installed base - million)	Year-end 1998	Year-end 2002E	CAGR 98-02E
Germany	6.5	23.8	38%
UK	5.2	17.7	36%
France	2.1	13.5	60%
Italy	1.4	6.5	47%
Sweden	1.7	4.8	30%
Netherlands	1.6	6.6	42%
Spain	0.9	4.2	47%
Finland	0.9	2.1	25%
Denmark	0.8	2.3	31%
Switzerland	0.7	2.9	42%
Norway	0.7	1.9	28%
Austria	0.5	2.2	44%
Belgium	0.5	2.5	52%
Portugal	0.2	1.1	51%
Ireland	0.2	0.8	45%
Greece	0.1	0.7	54%
Total	24	94	41%

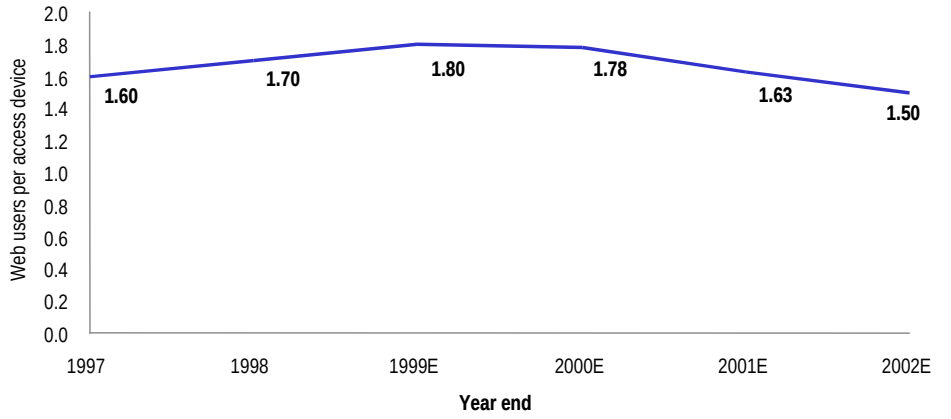
Source: WDR estimates, IDC

How many users are sharing an access device?

The ratio of users per device is a key component of our forecast modelling. By taking segmented web access device statistics and applying the forecasted ratio of users per device in different segments, as well as “user overlap” ratios, we believe reliable forecasts can be made.

On this basis, the overall user per device ratio is currently 1.8 in Europe, which indicates that a significant number of users are sharing a PC to access the internet.

Web users per access device in Europe, 1997-2002E



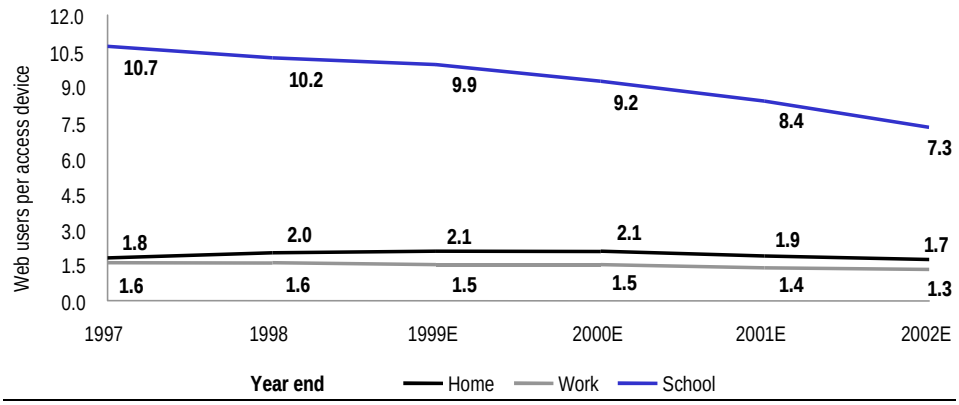
Source: WDR estimates, IDC

The user per device ratio has increased slightly since 1997, reflecting factors on both the supply-side and the demand-side:

- **Alternative web access devices were one to two years late coming to the European market.**
- **Web demand was higher than existing connections could satisfy.**

Going forward, we expect the number of users per device to decrease significantly once alternative web access devices become more widely available. Consequently, the ratio of users per device is expected to continue to increase slowly during 1999, but started to fall around the turn of the year as cheaper and less complicated devices are rolled-out.

Web users per access device by location, 1997-02E



Source: WDR estimates, IDC

The "web users per access device by location" ratio is an amalgam of three ratios:

1. Home users per web device

This ratio currently stands at two users per device in Europe. As very few European homes currently have more than one web device, this measure is not of great significance. The important measure, in our view, is the number of members of a household who log on.

The myth of the "anorak"

The market has long assumed that few people in a household use a given web connection, implying a user/device ratio close to one. This belief appears to be based on the view that most internet users are "techies", and generally men aged between 16 and 35.

We believe people from all walks of life and all age groups are now logging on from home…

However, many recent surveys suggest that this is not the case. On the contrary, the web user group appears to be becoming increasingly heterogeneous. In our view, we are already well beyond the "anorak" stage, with people from all walks of life and all age groups now logging on.

…supporting our view that home access is set to rise as set-top boxes and screenphones become commonplace

This supports our view that home access is set to increase sharply in the years ahead, putting upward pressure on the home user per device ratio. Moving further ahead in the forecast period, however, we expect the number of European households with web access to also increase as set-top boxes and screenphones become commonplace. We consequently expect the home user per device ratio to start to fall before December 2000.

2. Office users per web device

At 1.5 users per device, this ratio is lower than the "home" ratio (at 2.1) because most employees who need web access have their own PC. We expect this ratio to fall as companies invest more in web infrastructure throughout the forecast period.

3. Educational users per web device

School access remains a rarity in Europe at present…

Currently at ten students for every two devices in Europe overall, this ratio varies widely depending on the type of establishment. In certain high-level technical schools, the ratio may be as low as 1:1, but in most schools several students still share a web PC.

…but the situation is set to improve rapidly

Many European governments are planning to invest heavily in upgrading national educational IT infrastructures. As a result, the web should become available to far more primary and secondary schools, which are largely under-served in Europe at present. Thus the student to device ratio is expected to decrease as pressure from students in more web-advanced countries peaks and schools continually improve their computer facilities.

National users per device ratios vary from 1.5 to 2.2

The ratio of users per device varies considerably from one European country to another. In general, the more advanced a country is in terms of web usage, the more access devices, and thus the lower the user per device ratio – varying from around 1.5 in early-adopter countries to approximately 2.2 users per device for latecomers.

In our view, this disparity reflects the fact that demand-side pull rather than a supply-side push is currently driving web penetration. As PCs and web connections are still relatively expensive, the bulk of demand is still coming from individuals and businesses with a specific need or desire to get on the web, with the web penetration itself acting as a growth catalyst. Thus web penetration is generally higher in "developed" EU economies than in "developing" economies.

Users per device ratio by EU country, 1998-02E

	Year-end 1998	Year-end 2002E
Germany	1.6	1.4
UK	1.7	1.3
France	2.0	1.7
Italy	2.2	2.0
Sweden	1.5	1.2
Netherlands	1.5	1.1
Spain	2.2	2.0
Finland	1.8	1.3
Denmark	1.5	1.1
Switzerland	1.5	1.1
Norway	1.5	1.2
Austria	1.8	1.4
Belgium	1.7	1.3
Portugal	2.1	1.8
Ireland	1.8	1.5
Greece	2.3	2.1

Source: WDR estimates, IDC

However, as the table above illustrates, Finland is a notable exception to the "developed economy" rule. As an early-adopter country, Finland has a relatively high user per device ratio compared to other Nordic countries. One explanation for this is that a relatively high number of household members use the web in Finland, and that web penetration at the family level is higher than at other levels of the economy.

How many Europeans are already buying on the web?

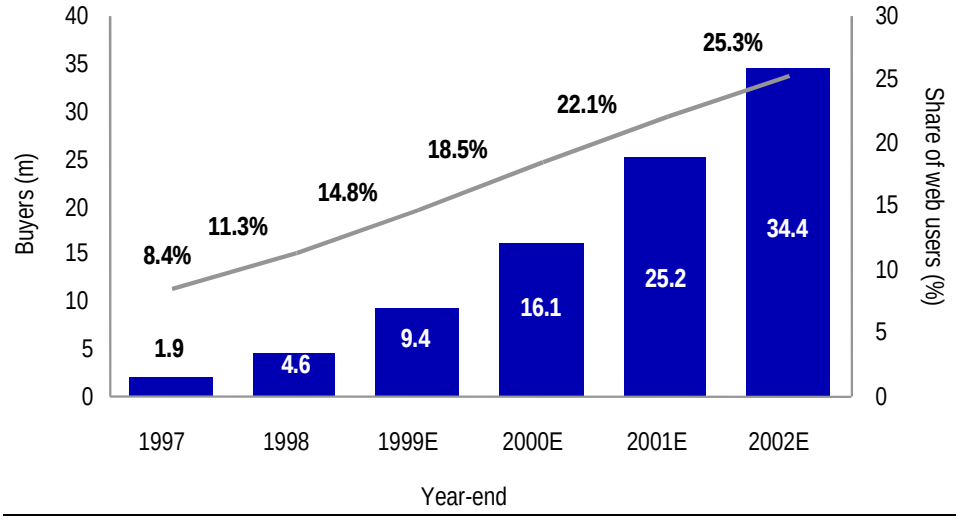
So far, Europeans have proved reluctant to buy on the web

Like the internet itself, the marketing and sale of goods and services over the web started in the United States. Since the mid-90s, internet use has grown rapidly in Western Europe, with many countries catching up with the US in terms of access. In contrast, Europeans have, so far, proved much more reluctant to do their shopping on-line.

On-line shopping lags web usage in Europe

Be it business-to-consumer (B2C) or business-to-business (B2B), on-line shopping is still not as popular in Europe as might be expected given the share rise in internet usage in recent years. By year-end 1998, just c.11% of all web users had made an on-line purchase during the previous three months.

Web buyers, 1997-02E



Source: WDR estimates- IDC

In our view, two factors have held back on-line shopping growth in Europe:

- **Even the most experienced internet users have proved reluctant to embrace on-line shopping, partly due to security concerns.**
- **Many Europeans are relative newcomers to the web, and have initially concentrated on exploring its other features.**

Nevertheless, both factors point to a rise in on-line shopping going forward. Consumer confidence in internet security is expected to steadily improve over the years as on-line payment systems become more secure and as payment becomes simpler.

- **The roll-out of secure home payment systems should convert many more web users to shopping on-line as fears of credit card fraud recede.**
- **More efficient distribution systems are being organised in Europe to ship non-digital goods ordered on-line to customers.**

- **The increasing number and rising quality of the goods and services available for sale on the internet in itself should spur demand. The trend should be accelerated as more and more household brands come to the net.**

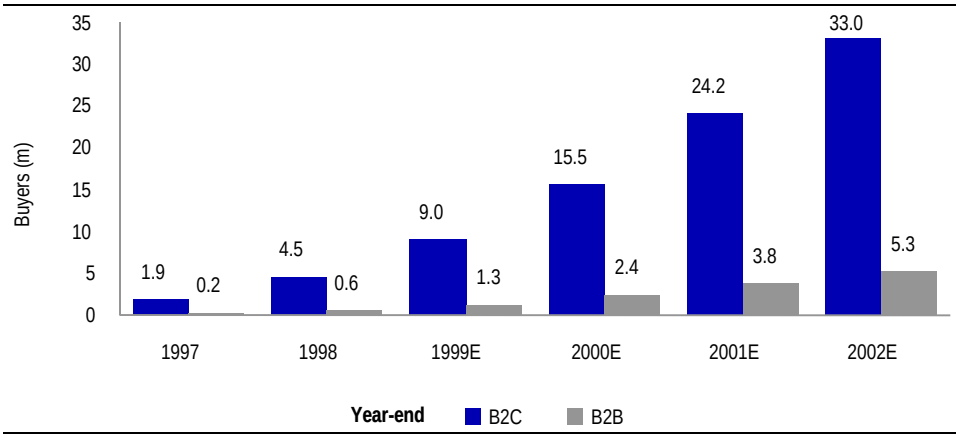
24% of all users expected to be buying on-line by end 2002E

IDC expects 24% of all European users to be buying on-line at least once every quarter by end 2002 –out of an on-line population of c34 million, up from less than ten million currently. However, even on this horizon, a large number of users are still likely to prefer bricks-and-mortar shops to the virtual store.

More individuals buy on-line than businesses

We see no reason why individual consumers should not continue to be the leading on-line buying force by far. At year-end 1998, 11% of all users made private purchases (B2C) over the web. For business-to-business (B2B) purchases, the figure was close to 1.5%.

Web buyers, 1997-02E



Source: WDR estimates- IDC

We do not expect B2B on-line purchasing volumes to grow as rapidly as the B2C segment, as business purchasing decisions are usually made by relatively few professional buyers. In value terms, however, B2B should easily outweigh B2C.

By year-end 2002, IDC expects only 4% of business users to be making purchases on-line compared to 24% of all web users. Our forecast that 25% of wired consumers will be making on-line purchases on the same horizon is based on the assumption that most business buyers are likely to make purchases on-line for their private needs.

The more homes connected, the more on-line purchases

On a country basis, on-line shopping activity is generally a function of the number of homes connected.

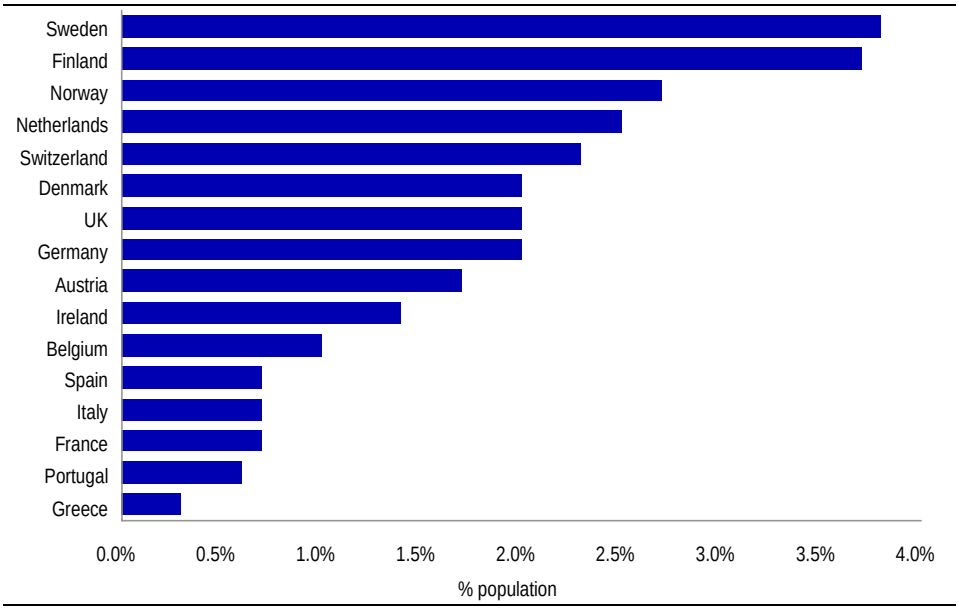
Web buyers as share of web users by country, 1998-02E

	Year-end 1998		Year-end 2002E		
	Buyers (m)	Share of users (%)	Buyers (m)	Share of users (%)	CAGR 98-02E
Germany	1.37	13%	8.61	26%	58%
UK	0.97	11%	5.86	26%	57%
France	0.31	8%	5.62	24%	106%
Italy	0.36	12%	3.32	25%	74%
Sweden	0.26	10%	1.51	26%	55%
Netherlands	0.32	13%	2.06	27%	59%
Spain	0.22	11%	2.04	24%	75%
Finland	0.16	10%	0.68	24%	44%
Denmark	0.09	8%	0.62	25%	62%
Switzerland	0.13	12%	0.86	27%	60%
Norway	0.10	10%	0.55	25%	53%
Austria	0.12	13%	0.79	25%	60%
Belgium	0.09	11%	0.78	23%	72%
Portugal	0.05	11%	0.48	23%	76%
Ireland	0.04	13%	0.28	26%	63%
Greece	0.03	11%	0.31	22%	79%
Total	4.62	11%	34.37	25%	65%

Source: WDR estimates- IDC

Nevertheless, the ratio of buyers to users tends to rise in countries where there are few users in absolute terms. Consequently, it is important also to consider the number of buyers relative to the total population. Looking at the figures from this angle, we see that there are far fewer on-line buyers in Greece, Italy and Spain than in Sweden and Finland.

Web buyers as share of population by country, YE 98



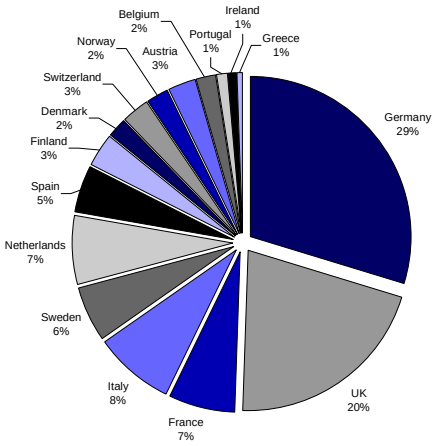
Source : WDR - IDC

Population does not explain everything

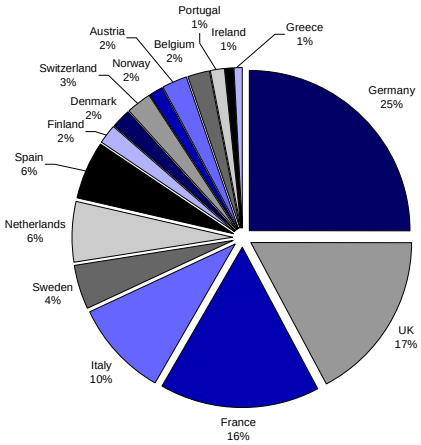
At year-end 1998, the four most populous countries combined (Germany, UK, France and Italy) accounted for two out of three on-line shoppers in Europe. While this partly reflects the size of the population in each country, the UK and, to a lesser extent, Germany pull the average up, whereas France and Italy drag it down.

On-line shoppers by country, % all Europe, 98-02E

4.6 m web buyers in 1998



34.4 m web buyers in 2002E



Source: WDR estimates- IDC

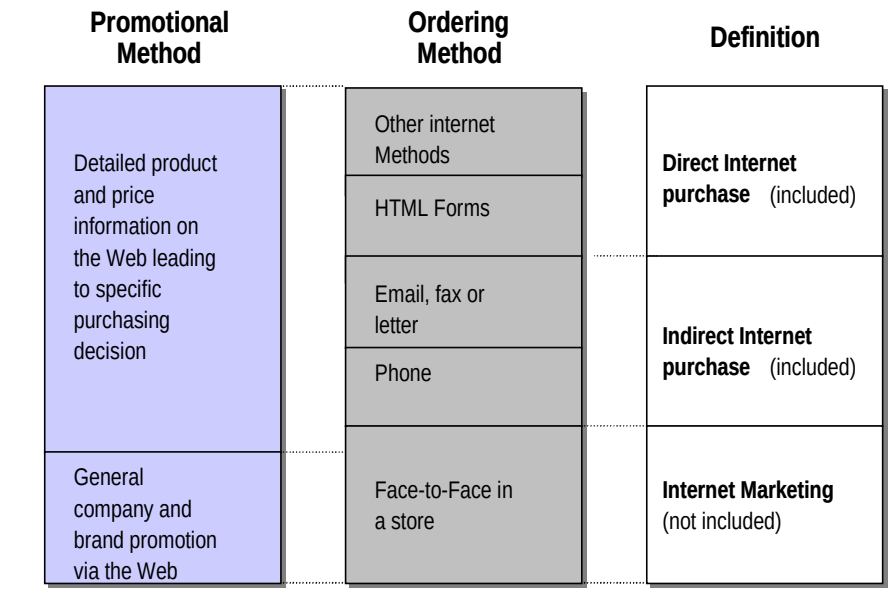
IDC expects on-line shopping to grow fastest in France relative to other core European markets

We do not expect the share of on-line shoppers to decline for the four core European markets over the forecast period. However, we expect growth to be driven by France and Italy. IDC's forecast for end 2002 is that 26% of all European on-line shoppers will be a resident of one of these four countries. The implication is that Germany is set to "underperform", while France puts in a considerable "outperformance" over the period. At the same time, other early-adopter countries (the Nordic region, the UK as well as Germany) should decline in relative terms.

How much do people spend on average on the web?

- **"Average spend" means average expenditure on products and services over the web during the previous three months.**
- **For "on-line purchase", read a paid transaction initiated through the web, ie, the web user buys goods he found on the web. The transaction, however, need not be completed over the web, ie, a transaction counts as an on-line purchase even if the product is ordered off-line (phone, fax, mail).**

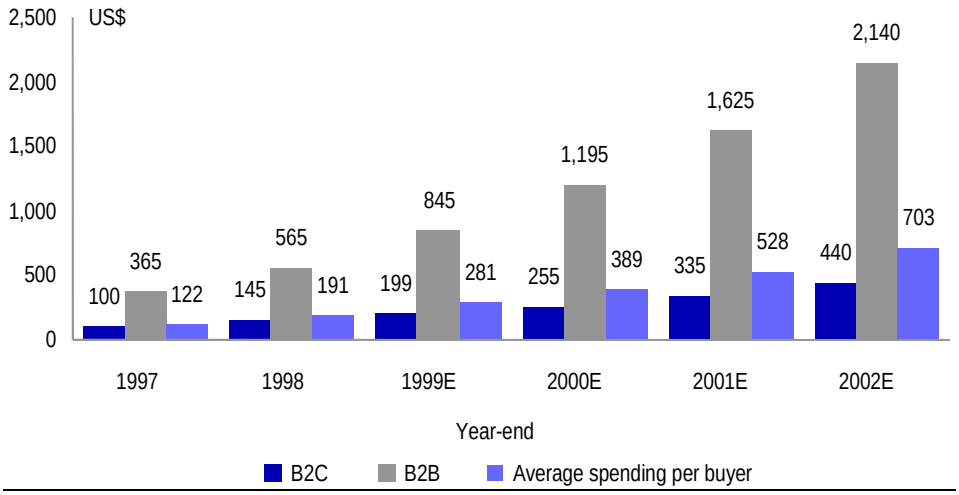
Internet commerce



Source: WDR

At year-end 1998, the average quarterly on-line spend per individual web consumer in Western Europe was US$145, compared to US$565 on average for business-to-business transactions.

Average quarterly on-line spend, 1997-02E



Source: WDR estimates – IDC

As the above graph illustrates, the average on-line spend is expected to more than double by 2002, with both consumers and businesses spending more.

- Not only are an increasing number of European consumers expected to shop on the web, they are also expected to shop more frequently and for a wider range of products and services. For example, on-line demand for expensive goods such as airline tickets, insurance, and even cars, looks set to take off in Europe. If a forecast US$440 average spend by 2002 looks high at first, bear in mind that this figure includes high-ticket items such as PCs (well above US$1,000 on average).

- The average B2B spend should also rise. Relatively few employees are authorised to make purchases on behalf of companies or, indeed, divisions of companies. Currently, the most frequent on-line B2B purchases are IT equipment, software, travel, and information. In the near term, we expect commodities such as printer paper to become widely available, and widely purchased, on the internet.

Spending is mainly a function of market maturity

Average spending rates differ significantly from country to country around Europe, from US$60 per buyer per quarter in the least developed markets to close to US$250 in the UK at year-end 1998.

Average quarterly on-line spend by country, 1998-02E

(US$)	Year-end 1998	Year-end 2002E	CAGR
Germany	211	822	40%
UK	248	928	39%
France	139	625	46%
Italy	101	371	38%
Sweden	180	689	40%
Netherlands	194	699	38%
Spain	76	285	39%
Finland	181	701	40%
Denmark	229	877	40%
Switzerland	227	948	43%
Norway	233	937	42%
Austria	195	797	42%
Belgium	122	491	42%
Portugal	59	242	42%
Ireland	169	657	40%
Greece	71	260	38%

Source: WDR estimates- IDC

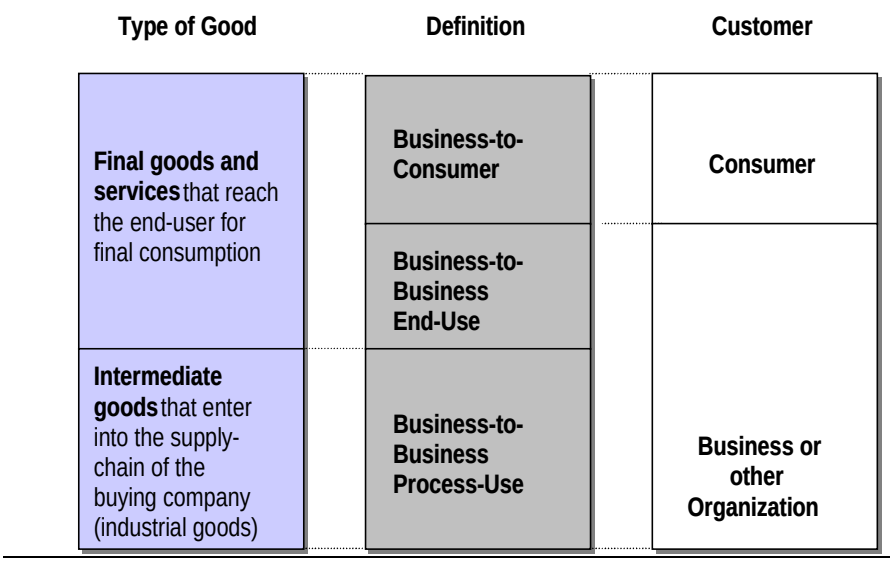
Apart from market maturity, a number of other factors explain differences in average spend from one market to another**.**

- Purchasing power varies widely between the relatively rich countries of Northern and Central Europe and the less affluent countries of Southern Europe.
- Cultural differences can influence the amounts on-line shoppers are prepared to "risk" on the web. For example, shoppers in Germany, Switzerland and Austria are known to be very comfortable with distance buying as these markets have long been served by highly efficient mail-order companies. The fact that spending on books and tourism per head is the highest in Western Europe also appears to raise the propensity to spend on-line in these three countries, as it does in the Nordic and Benelux markets.
- In countries like Denmark and the Netherlands, a relatively large share of on-line shoppers (around 17%) are business buyers, compared to 10-12% in most "Latin" countries (France, Spain, Italy). This makes for a higher average spend overall. In our view, this reflects the fact that most Danish and Dutch businesses are relatively small and have comparatively flat hierarchical structures, making for more flexible purchasing procedures. As a rule, on-line purchasing takes longer to catch on in large, more hierarchical corporates.

How much is sold on the web?

E-commerce can be split neatly into three segments: (1) business-to-consumer (B2C): (2) business-to-business end use ($B2B^{eu}$); (3) and business-to-business process use ($B2B^{pu}$), referring to purchases which enter into the buyer's supply chain.

Internet commerce by product use definition



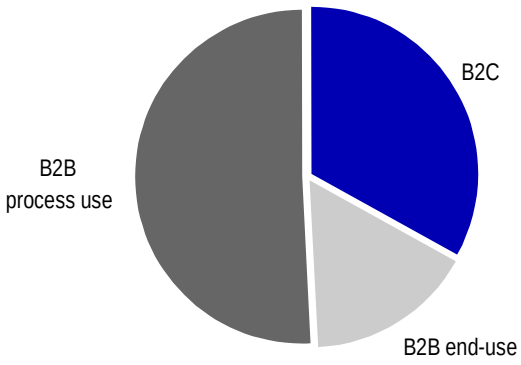
Source: WDR

US$5.6bn rung up at the European e-till in 1998

In value terms, $B2B^{pu}$ dominated European e-commerce in 1998

In 1998, internet commerce in Western Europe was valued at an estimated US$5.6bn. At US$2.85bn, the bulk was generated by $B2B^{pu}$ commerce, ie, the purchasing of products that enter into supply-chains for further processing or resale. Such transactions, by their very nature, are low-profile. In addition, some US$900m worth of goods and services was bought for end-use in businesses –$B2B^{eu}$– while the direct-to-consumer –B2C– segment accounted for approximately US$1.85bn.

Breakdown of European e-commerce, 1998



Source: WDR - IDC

Supply-side: a few players still account for the bulk of e-trade

Not surprisingly, the big IT players are setting the pace in B2B^{pu} e-commerce…

Looking at business-to-business process-use commerce, we find that few companies currently account for the majority of on-line sales. Typically, the B2B^{pu} first-movers are large IT companies that have been quick to take their ordering systems on-line. Intel and Cisco are often cited as examples of this. Cisco recently announced that 77% of its orders in Europe are now received electronically, and Intel has had similar success on-line.

…but there are more on-line sellers than process-use operators

As for end-use focused web-sellers (both B2C and B2B^{eu}), there are more players in this segment, but their on-line turnover is relatively low compared to B2B^{pu}. In the current marketplace, consumer sites generally offer either entertainment (books, CDs), travel services, news, PCs and software, electronics, or the range of goods featured in traditional mail-order catalogues.

Mainstream brands are now selling on-line…

Until now, most of the successful European sites have been start-ups, focused entirely on internet commerce. However, a number of established European brand players are now moving into on-line marketing and sales in a big way.

…but Europe still lags far behind the US

Even so, e-commerce is still in its infancy in Europe, where the e-offer is often sparse, especially compared to the US. For instance, those European retailers that have gone on-line often offer only a small proportion of their goods and services over the wire, viewing their sites as simple tests rather than fully-fledged sales channels.

Europe's Top 10 e-commerce sites, H1 99

Company	Product	Overall Ranking	General Score	Value Proposition	Ease-of-use	Trust	Localisation
QXL	Auctions	1	8.18	1.4	1.4	1.7	2
Amazon.com	Books	2	7.95	1.7	1.4	1.6	1.3
BOL	Books, CDs	3	7.50	1.3	1.3	1.6	2
Proxis	Books	4	7.27	1.6	1.5	1.7	1
Dell Computer	Computers	5	7.27	1.1	1.1	1.6	2
RS Components	Electronics	6	6.59	1.5	1.4	1.3	0.8
Viking Direct	Office supplies	7	6.36	1.4	1.4	1.6	0.3
Expedia	Travel	8	6.36	1.2	1.1	1.7	0.8
Buyonet	Computers	9	6.25	1.2	1.1	1.7	1
Chateau-On-line	Wine	10	5.91	1.2	1.1	1.6	0.8

Source: Forrester

The European statistics can be misleading as they conceal imports from non-European sites

Note also that internet commerce statistics for Europe reflect what European web users buy rather than what European companies sell. Thus a significant proportion of sales can be assumed to be imports from non-European companies, especially the US.

Demand-side: Europeans are still reluctant to buy on-line

Security issues remain the biggest obstacle to e-shopping…

Looking at the end-use segment, especially B2C, we find that many consumers are still reluctant to buy on-line, mainly due to a perceived lack of security. (Most people are not aware that credit card fraud is actually less common on the web than in the "3D" world.) In addition, consumers are often reluctant to trade with companies that they know only through the web.

…while lack of price competitiveness has proved an impediment to e-business

Moreover, the European businesses community has also been slow to move end-use purchasing processes on-line. One major impediment has been the fact that on-line prices are not (yet) significantly lower than prices available through traditional channels.

Although there is evidence that price is not a real issue, we doubt this can last

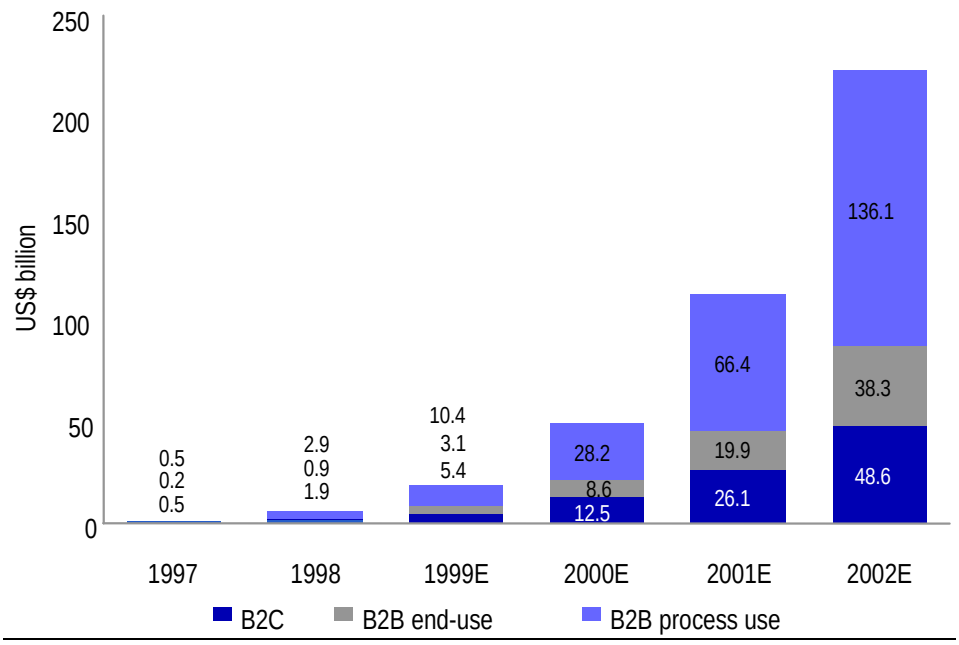
Note, though, that some large-scale price comparisons show that consumers are sometimes happy to pay more for the convenience of buying on-line. However, we believe it is only a question of time before this situation reverses.

A European market worth no less than a quarter of a trillion US dollars by 2002E

European e-commerce set to triple every year up to 2002E

All in all, on-line commerce remains at an experimental stage in Europe. Nevertheless, the drivers needed for rapid growth seem to be already kicking in, with both the on-line population and the average spend per e-transaction on the rise. Hence our forecast of a threefold rise in European e-commerce in each of the next three to four years, implying a market worth no less than a quarter of a trillion dollars by 2002E.

Internet commerce revenues, 1997-02E



Source: WDR-IDC

Fast-track growth in both B2C and B2B^{eu}...

Powerful growth in B2C and B2B^{eu}

Over the 1998-02E period, we expect B2C revenues to grow at a CAGR of 125% in Europe, and 155% in B2B end-use. In both cases, we expect three factors to drive growth:

- **An increasing number of individuals with web access and/or the opportunity to buy on the web;**
- **An increasing share of users who actually buy on-line;**
- **An increasing spend per on-line buyer.**

...but easily outpaced by B2B^{pu}

...but beaten by B2B^{pu}

However, we expect the bulk of growth to come in B2B process-use, and are forecasting a CAGR of 163% for this segment over the 1998-02E period.

Process use: high value but standardised, repetitive transactions can add up to huge savings on the web

Why such rapid growth? Transactions carried out at the process level tend to be highly standardised and repetitive, but represent much higher value than the typical B2C or B2B^{eu} trade. Substantial savings and efficiencies can be realised simply by switching B2B processes on line, and abandoning paper, fax, and even proprietary electronic data interchange systems (EDI).

We expect B2B^{pu} flows to account for 61% of all European e-commerce by 2002

We expect this value/scale factor to be the major driver behind the shift of B2B^{pu} flows onto the net, underpinning our assumption that this segment is set to grow from around 51% of all European e-commerce today to 61% by 2002E.

Even treble-digit e-commerce growth would barely scratch the surface in Europe

Whatever the growth rate, virtual shopping is unlikely to win more than a fraction of the trade done through traditional channels

However, even if the various e-commerce segments double or treble in value annually, trade over the web would still be a relatively small-scale activity by the end of our forecast period.

Whatever the growth rates, it is hard to imagine that more than a fraction of the products and services sold today will be available on-line going forward. We see several reasons for this inertia:

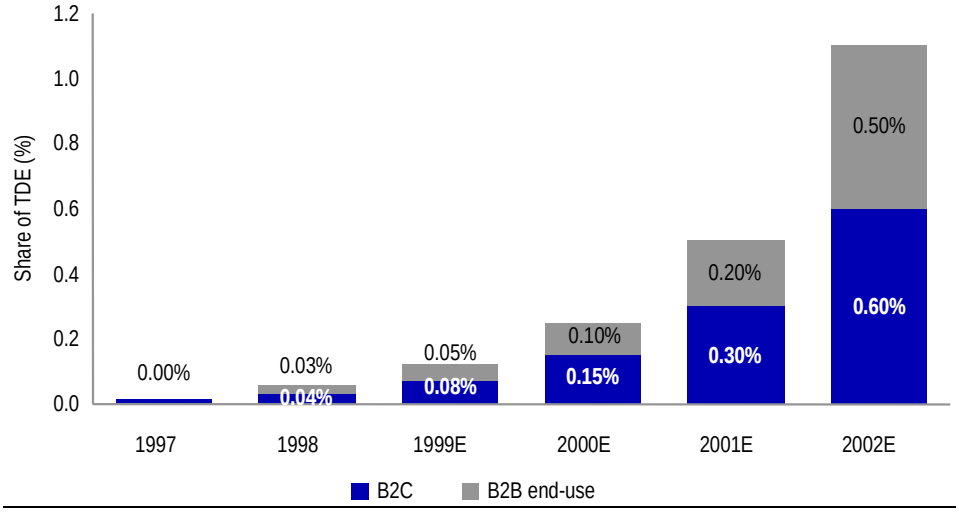
- Many goods and services require individual selection and personal contact between the buyer and seller, and thus are never likely to be suitable for electronic commerce (eg, many people seek advice before buying DIY articles). Moreover, we believe major cultural and organisational changes are needed before on-line shopping can become commonplace, even for products that the most appropriate for on-line sales.
- From a business perspective, e-commerce on a grand scale would require tremendous changes in both business practices and technology. So far, very few B2B services or products are fully available on-line in Europe. And while sellers are coming on-line in increasing numbers, they still represent just a tiny fraction of corporate Europe.

- From the European consumer's standpoint, a lack of choice and often un-competitive on-line prices hardly favour the web. In contrast, US sites generally carry a much wider variety of goods and, more frequently, lower prices, attracting many Europe-based shoppers as a result. Then again, longer delivery times and higher transport costs often offset the benefits of cross-Atlantic shopping (not to mention a fear of paying on-line by credit card, and often complex off-line payment procedures). In this respect, cultural factors are probably even more important than the practical obstacles.

Just 1% of Total Domestic Expenditure in Europe by 2002E

Even if e-commerce revenues reach our forecast of US$87bn a year by 2002 in Europe, on-line shopping would still account for barely 1% of Total Domestic Expenditure. TDE is GDP plus imports less exports.

Share of Total Domestic Expenditure, 1997-2002E



Source: WDR estimates- IDC

TDE is an unreliable measure of B2B^{pu} flows

Note, however, that it would be misleading to measure B2B^{pu} against Total Domestic Expenditure. Process-use purchases are by definition not included in TDE (nor in GDP), which is a function solely of value added in the production cycle.

Which countries are likely to set the pace?

In our view, the best measures for gauging a country's development in terms of e-commerce are Total Domestic Expenditure (TDE) and per capita penetration.

- Total e-commerce in Western Europe in 1998 amounted to 0.07% of TDE. This equates to approximately US$15 for each European citizen including children. By end 1998, e-commerce was most developed in Finland and Sweden on this measure, while France, Italy and Greece were at the bottom of the league.
- On our estimates, e-commerce should equate to US$571 per year per capita in Europe by 2002E, or the equivalent of 2.7% of TDE excluding process-use transactions (see following table).

E-commerce by country, 1998-02E

	1998		2002E	
	Share of TDE (%)	USD per capita ($)	Share of TDE (%)	USD per capita ($)
Germany	0.08%	20.00	3.04%	750.00
UK	0.11%	24.00	3.69%	794.00
France	0.03%	6.00	2.12%	475.00
Italy	0.03%	7.00	1.63%	317.00
Sweden	0.12%	29.00	4.09%	958.00
Netherlands	0.11%	23.00	3.73%	780.00
Spain	0.03%	5.00	1.53%	204.00
Finland	0.13%	27.00	3.45%	723.00
Denmark	0.08%	26.00	3.16%	975.00
Switzerland	0.08%	27.00	3.19%	1047.00
Norway	0.10%	31.00	3.33%	1051.00
Austria	0.07%	17.00	2.80%	713.00
Belgium	0.04%	9.00	1.91%	411.00
Portugal	0.03%	4.00	11.57%	178.00
Ireland	0.06%	11.00	2.65%	465.00
Greece	0.03%	3.00	1.26%	156.00
Total	0.07%	15.00	2.69%	571.00

Source: WDR estimates, IDC

The e-commerce league standings are set to change significantly between now and 2002:

- **France should rise in the rankings;**
- **Finland is likely to slip down the rankings in TDE terms;**
- **Norway, Switzerland and Denmark should stay in the leading pack in per capita terms.**

For sheer magnitude, Germany dominates today

Germany currently accounts for almost one third of all European e-commerce transactions, and no less than 35% of B2C sales. Not only is Germany the largest country in Western Europe, it also has a unique (for Europe) mail-order culture, rapidly rising internet penetration, and a high level of per capita spending in traditional shopping channels.

Internet commerce revenues by country, 1998-02E

($ bn)	1998	2002E.	CAGR (est)
Germany	1.7	62.8	147%
UK	1.4	47.6	141%
France	0.4	28.5	194%
Italy	0.4	18.1	163%
Sweden	0.3	8.7	140%
Netherlands	0.4	12.6	143%
Spain	0.2	8.0	159%
Finland	0.1	3.7	127%
Denmark	0.1	5.2	149%
Switzerland	0.2	7.8	152%
Norway	0.1	4.7	142%
Austria	0.1	5.8	153%
Belgium	0.1	4.4	163%
Portugal	0.0	1.8	167%
Ireland	0.0	1.7	157%
Greece	0.0	1.7	164%
Total	**5.6**	**223.0**	**151%**

Source: WDR - IDC

Some surprises among the leaders and laggards

- The **UK** currently accounts for a relatively large share of the European market on the back of a large user base, a high number of early adopters, and the highest average e-spend per buyer in Europe. This is not surprising considering that the UK is home to some of the most successful European news and retail sites, which also reflects the fact that English is widely spoken in Europe.
- At 5% currently, the **Swedish** share of the total European market is remarkable for such a small country. Rapidly rising e-sales reflect the fact that more adult Swedes buy on-line than any other Europeans.
- The **Netherlands** also ranks highly, the result of a large user base and a very active business-to-business segment.
- In contrast, **France** and **Italy** have remarkably low rankings, especially considering their large populations and developed economies. The same is true for the other "Latin" countries, **Spain** and **Portugal**.

The IDC rankings are set to change radically by 2002

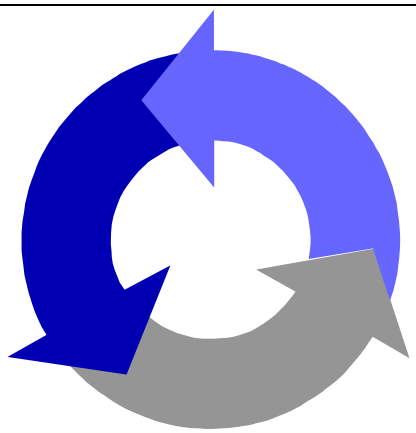
- As other countries close the gap, **Germany** and the **UK** are likely to slip down the rankings, as are the **Nordic** countries and The **Netherlands**.
- **France**, on the other hand, is expected to catch up fast, and account for an estimated 13% of total European e-commerce by 2002, and 14% of the B2C segment. Although mail order is not as popular in France as it is in Germany, many people in France have long used France Telecom's fifteen year old screenphone Minitel system to shop, and should therefore have little difficulty transferring to the web.
- Growth in the Southern European countries should be relatively strong overall. However, even at the end of our forecast period in 2002, **Italy**, **Spain**, **Portugal** and **Greece** combined are unlikely to account for more than 13% of total European e-commerce, and just 8% of the B2C segment – despite being home to 30% of the European population.

Internet advertising comes of age

On our estimates, worldwide spending on internet advertising should reach US$33bn by 2004 on the back of thriving e-commerce, a growing on-line audience and new marketing technologies. Europe should account for an estimated c17% of this spend, or US$5.5bn. As on-line spending grows, we expect advertisers to base their on-line space purchasing decisions on performance (ie, return per view), rather than the cost-per-thousand views (CPM) measure widely used today.

We expect new advertising dollars to flow to the web from traditional media, below-the-line marketing budgets, and funds raised by e-traders from capital markets. As a result, on-line advertising spending should spiral upward, as illustrated below.

Internet advertising continues to spiral upward



Accelerating e-commerce
- US$48.6 billion B2C by 2002E
- US$1472 annual average online spend per web buyer by 2002E

Growing online audience
- 135 million online users by 2002E
- 25% of online users to have broadband access by 2002E

New marketing technologies
- Interactive banners
- Paperless coupons
- ROI tracking tools

Source: WDR - Forrester

Rising on-line audience

A rising on-line audience should draw an increasing share of advertising dollars to the web

A rapid increase in the number of users, and the subsequent rise in marketing and merchandising opportunities, should draw a rising share of advertising dollars to the web. Based on our projections, we expect the European on-line advertising audience to grow from 63 million in 1999 to 135 million by 2002. At the same time, the “page views per visit” rate (PVPV) should be boosted by the 34 million users expected to have ultra-fast broadband access on the same horizon.

Accelerating e-commerce

E-tailers are likely to clamour to reach users across the entire marketing cycle

As e-commerce thrives, we expect marketers to spend more across the selling process. On our estimates, B2C revenues alone should reach US$48.6bn in Europe by 2002. As retailers establish on-line stores, they are likely to clamour to reach users across the entire marketing cycle. After all, beyond generating awareness, advertising can get consumers thinking about products, encourage preference, and secure loyalty.

Marketing technology advances

A variety of tools can be used to measure advertising ROI on the web, representing a huge advantage over "un-measurable" traditional media

Marketers' ability to track on-line user behaviour is being constantly enhanced by products such as DoubleClick's Closed Loop Marketing and Wink's interactive TV technology. These tools provide feedback on what users do once they have clicked on an on-line ad, reporting back such information as whether a sale was made, time spent perusing an offer, repeat visits, etc. Not least, this enables on-line advertisers to accurately measure returns on investment (ROI).

All this underpins our central view that the greater accountability and efficiency of web advertising should entice more and more dollars away from traditional "un-measurable" media such as the press and TV.

Internet advertising gains traction in Europe

In Europe, we expect on-line ad spending to grow from US$286m in 1999E to US$5.5bn by 2004E, representing 5.1% of total European advertising dollars.

The European e-ad market is small, but should grow rapidly

(US$ m)	1999E	2000E	2001E	2002E	2003E	2004E	CAGR est (%)
Germany	92	202	397	730	1,241	1,861	82
UK	81	177	347	597	955	1,414	77
France	33	71	135	243	425	679	83
Scandinavia	26	49	94	153	222	355	69
Netherlands	11	25	51	89	142	213	81
Others	43	96	193	362	604	958	86
Total Europe	286	620	1217	2,174	3,589	5,480	81

Source: WDR estimates

E-ad numbers can be misleading

Note that our estimates are stripped of non-cash advertising revenues generated by barter, revenue sharing and intra-industry spending.

Barter artificially inflates reported revenues

The headline numbers can be artificially inflated by the exchange of services within the industry…

Web sites often barter advertising space and services between themselves. While barter typically accounts for 5% of large portal revenues, we believe that smaller content sites are aggressively bartering as an inexpensive way to market themselves and book revenues. This has the effect of artificially inflating site revenues. How wide spread is this practice? In the first quarter of 1999, iVillage reported that 13% of its revenues came from barter and CNet 12%. Forrester projects that barter for the industry as a whole could amount to 8% of reported revenues in 1999.

Revenue sharing is still a problem, but receding

…double-counting when business is split between more than one site…

Double-counting occurs when two sites split ad revenues. For example, Site A books an order for US$100,000 for advertising space, then, to extend reach, gives US$50,000 of the business to Site B. When this happens, the industry reports $150,000 in revenues, when in fact only US$100,000 in cash has changed hands. However, tracking hassles and measly revenues have resulted in a decrease in revenue sharing over the last twelve months, and Forrester projects that this should account for only 5% of all European e-ad revenues in 1999.

Intra-industry spending

…and purely intra-industry spending

The relatively common practice of one site paying another to promote it does not increase the amount of money sloshing around within the industry in absolute terms, and there is no real increase in sales. Looking at 1998 web spending by the top 50 on-line advertisers, we find that 16% came from internet media firms. Forrester estimates that one third of that spending went back to other media sites. On this basis, intra-industry spending is likely to account for 7% of reported e-ad revenues in 1999.

E-advertising may be new to Europe…

The internet is still a novelty in many European countries…

On the one hand, the internet is only just starting to take hold in many European countries, and many marketers lack the experience to start their on-line advertising engines.

…but rapid growth drivers are already in place

…but is poised to grow at twice the rate of the US

On the other hand, the time-to-market for new products and services in Europe is roughly half that experienced in the US. For example, eBay was launched on the American market in September 1995, but did not gain critical attention until late 1997. By comparison, it took only one year for auction fever to grip Europe with the emergence of QXL and Ricardo in 1999. Many forces drive are driving this rapid growth.

IPO fever grips Europe

Roughly 47% of new capital attracted to the internet is allocated to advertising

Internet financing in Europe was given a big push forward in 1999 with Freeserve's (UK) successful IPO. Venture capital and corporate investment funds are also fuelling the capital rush. While considerable funds are being allocated to infrastructure build-outs, e-advertising is also getting a substantial boost, grabbing 47% of e-commerce, capital-funded operating budgets on average.

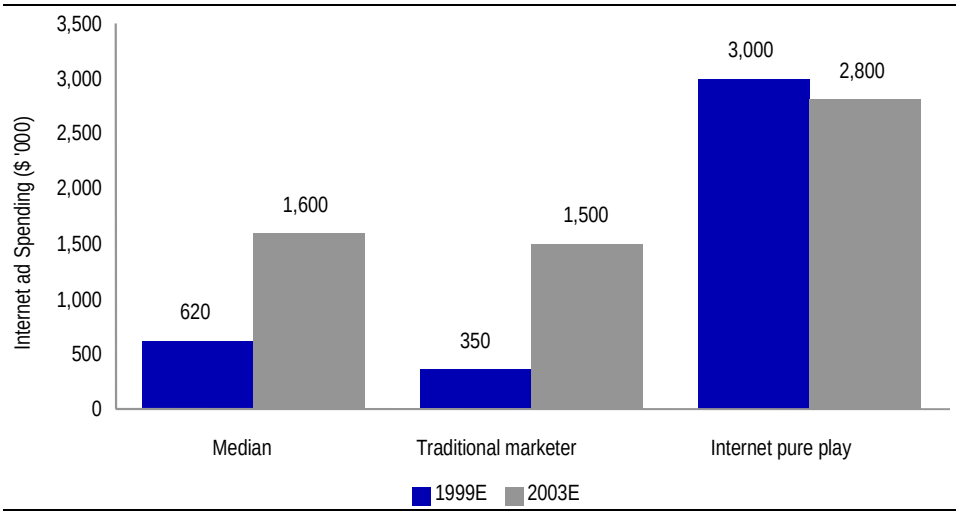
Internet pure play retailers spend ten times more on web advertising than traditional marketers …

On our estimates, a typical pure play internet retailer currently spends an average of US$3m on on-line advertising, some ten times more than the typical traditional marketer is spending on the web.

...but we expect traditional marketers to close the gap

While traditional marketers are forecast to increase their web budgets by an estimated fivefold over the next five years, we believe dot-com companies are likely to decrease their net spending in absolute terms. Instead, we expect the dot-coms to allocate more resources to attracting new customers through traditional media, essentially print and TV.

On-line ad spending: pure plays versus traditional marketers



Source: WDR estimates - Forrester

Business transformation

As the forces explored above drive an acceleration in on-line advertising expenditure, revenues at the top ten portal sites rose by an estimated 105% over 1999. Given that these portals capture some 65% of the market, high growth portals should dictate overall industry ad growth over the next three years. At the same time, we expect this acceleration to have a deep impact at several other levels: performance-based advertising, total on-line spending, and on-line marketing costs.

1. From CPM to performance basis advertising expenditure

We expect performance-based advertising –be it pay-per-click, pay-per-lead or pay-per-customer– to rise from 15% of on-line ad budgets in 1999E to 50% of budgets by 2003. At the same time, classic "cost-per-thousand exposure" (CPM) deals –which are "readership" driven rather than based on measurable response– should wane in importance.

Portals advertising revenue streams (1999E)

Contract structure	% of contracts	Cost range
Page views – CPM	28%	US$1-40 CPT
Transaction fee	17%	3-12% commission on sales
Ad revenue share	17%	50/50 split
Banner	13%	Bandwidth to banners
Flat fee	11%	US$7-50,000 per month
Click-through rate	9%	US$6-8 per click
Customer acquisition fee	6%	$8-32 per new customer
Other	17%	na

Source: WDR estimates – Forrester Research

2. Driving on-line ad spending closer to US$25 per capita

The value of on-line consumers should increase as they spend more time and money on the internet. With average European household spending set to double between 1999 and 2003 on our estimates, per capita spending on on-line advertising should increase from US$8 in 1999E to $24 in 2002E.

3. Pushing up on-line marketing costs

By our calculations, advertising represents close to 16% of e-commerce revenues, compared to 8% in traditional retail. The gap is explained by several factors: (1) on-line marketers are in customer-acquisition mode; (2) on-line ads also generate offline sales; (3) clutter in the e-marketplace requires additional spending to get users' attention.

Dollars should flow to the net from several sources

As these forces generate an increasing number of merchandising opportunities, the question of where the money is to come from becomes paramount. Our research shows that marketers are tapping into three sources of funds to finance their on-line activities.

The capital markets

Web start-ups typically raise capital from IPOs and venture capital funds. A number of traditional marketers have also stated that tapping into the markets is vital to their on-line plans. For example, Disney plans to issue an internet tracking stock to fund its on-line initiatives.

Below-the-line marketing budgets

The net is more than just a communications medium that serves ads to users. It also serves as a commerce channel. As a result, a number of traditional corporates admit to raiding their non-advertising, or below-the-line, marketing budgets (usually earmarked for special events, conferences, promotions) to fund on-line initiatives. Affiliate programs are a good example, with, say, a history book site referring users to a travel agency that specialises in history tours, and vice versa. Pushing this to the extreme, such deals could reduce the need for a "flesh and blood" sales force to the minimum.

Traditional media budgets

In our view, two examples highlight the importance of traditional advertising budgets as a source of internet ad financing: (1) Ford recently increased its internet advertising budget partly at the expense of spending in magazines; (2) top ranking credit card issuer First USA has stated that it is financing a number of large internet partnerships –such as its US$500m multiyear link-up with AOL– using dollars initially earmarked for other media.

The internet economy

What is the internet economy?

We consider that the internet economy is made up of companies which directly generate all or part of their revenues from internet or internet-related products and services.

- **The internet infrastructure and applications produced by the likes of Cisco, Dell, IBM and Oracle make electronic commerce possible. IBM's servers and PCs afford access to the web, as do 3Com's modems and Cisco's routers.**
- **Then come companies that sell products and services over the Internet, ranging from pure plays like Amazon.com and eToys.com, to bricks-and-mortar players such as LL Bean and Alaska Airlines which are doing some business on the net as well.**
- **Last but not least come the electronic intermediaries or internet middlemen, such as eBay (on-line auctions) and Egroups (e-mail groups). These act as catalysts by facilitating interaction between buyers and sellers.**

How can the internet economy be measured?

Before endeavouring to gauge the value of the internet economy, we came to the following conclusions about what constitutes the internet:

- **The internet is a network of networks, made up of many components.**
- **Networking hardware and software, servers, PCs and other web access devices, web software, web designers, web operators, and the companies that do e-business are all components of the net.**
- **There is a natural structure or hierarchy to the internet that can be directly traced to how businesses generate e-revenues.**

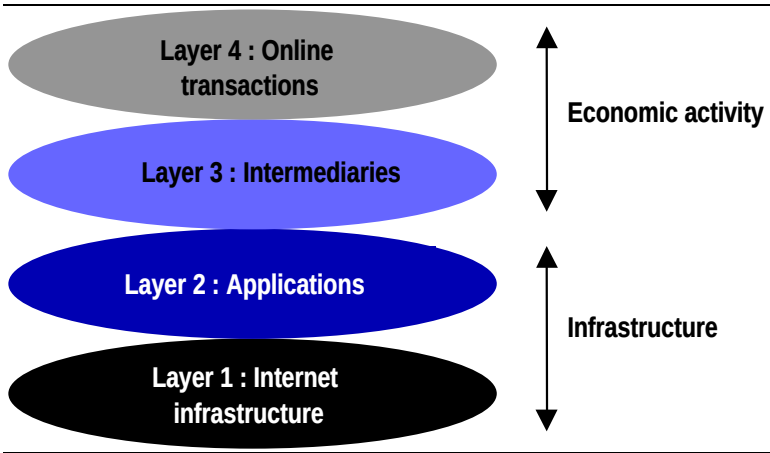
A two-tier economy: infrastructure and activity

On this basis, we believe the internet economy can be broadly split into two tiers, infrastructure and activity.

In turn we then split the infrastructure and activity tiers into four distinct but interacting layers:

- **The physical infrastructure of e-commerce.**
- **Internet applications that make e-commence work.**
- **Intermediaries. These range from market makers, providers of expertise or certification (offering choice and security to buyers), and search and retrieval services which reduce transaction costs in an electronic market.**
- **Transactions, ie, direct trade between buyers and sellers such as manufacturers and e-tailers.**

The internet economy



Source: WDR – University of Texas

We recognise that there are grounds to argue that e-tailers should be placed in the intermediary layer, as they sit between consumers and manufacturers. However, we believe a distinction should be made between e-tailers, like Amazon.com, and electronic intermediaries (eg, eBay, Yahoo!) in the purest sense of the term. A typical intermediary would, for example, enable users to widely source books or CDs according to categories such as "lowest price" or "quickest delivery". By contrast, Amazon.com displays only its own catalogue, prices, availability and lead-time.

Layer 1: internet infrastructure

The physical economy critically depends on an efficient infrastructure in which transportation, energy, raw materials and a skilled workforce are interwoven. Likewise the growth of the digital economy depends on the ubiquitous presence of high speed and intelligent electronic networks, and the ability to share any type of content between all agents in the economy.

Accordingly, the internet infrastructure layer includes companies that manufacture or supply network products and services, telecommunications and fibre backbones and access and the end-user networking equipment necessary for the proliferation of e-commerce. We list below the key layer one players:

- **Fibre optics makers: Corning, Pirelli;**
- **Networking hardware/software companies: Cisco, Lucent, 3Com;**
- **Internet backbone providers: Qwest, MCI Worldcom;**
- **PC & Server manufacturers: Dell, Compaq, Hewlett Packard;**
- **Security vendors: Verisign, Entrust Technologies, Checkpoint Software Technologies;**
- **Internet service providers: Mindspring, AOL, Earthlink.**

Layer 2: internet applications

The products and services found in this layer constitute the tools needed to conduct business on-line. In addition to software applications, this layer includes the human capital involved in the design, deployment and maintenance of sites, be they portals or full e-commerce sites. The key players at this level are:

- **Web development software: Adobe, NetObjects, Allaire, Vignette;**
- **Web-enabled databases: Oracle, IBM DB2, MS SQL Server;**
- **Search engine software: Inktomi, Verity;**
- **Internet commerce applications; Netscape, Microsoft, Sun, IBM;**
- **Multimedia applications: RealNetworks, Macromedia;**
- **Internet consultants: USWeb/CKS, Scient;**
- **Web hosting and support services: Exodus, Globix, Verio;**
- **Transaction processing companies: First Data, ADP;**
- **On-line training: Sylan Prometric, Assymetrix;**

Layer 3: intermediaries

Intermediaries bring e-buyers and e-sellers together and act as catalysts between layers

Internet intermediaries increase the efficiency of electronic markets by bringing together buyers and sellers over the internet and facilitating interaction between them. Intermediaries also act as catalysts in the process through which investment in the infrastructure and applications layers is transformed into business transactions.

We believe the internet needs a new breed of intermediary

While much has been written about the risk of large-scale disintermediation in the transformation from the physical to the digital economy, we believe the internet necessitates a new breed of intermediary whose role is naturally information and knowledge intensive.

Location is key in the 3D world…

In the physical world, intermediaries are distributors and dealers whose primary role is to increase the efficiency of distribution and to lower buyer transaction costs by locating close to customer population.

… but is not an issue on the net

In sharp contrast, physical proximity is not an issue on the internet:

- **On-line search, evaluation, communication, co-ordination, and the assurance of vendor and product/service quality are the most important aspects of the internet economy;**
- **In this context, internet intermediaries play a critical role in filling information and knowledge gaps which would otherwise impair the functioning of the internet as a business channel.**

Such intermediaries do not directly generate revenues from transactions, but their web-based businesses do earn revenues by carrying advertising and collecting subscription fees and commissions. As is apparent in the following list, many of the

layer three companies are purely web content providers, while others are market makers or market intermediaries:

- **Vertical market makers: VerticalNet, PCOrder;**
- **On-line travel agents; TravelWeb, 1Travel;**
- **On-line brokerage: E*Trade, Schwab.com, DLJDirect;**
- **On-line auction: eBay, QXL;**
- **Content aggregators: Cnet, Zdnet, Broadcast.com;**
- **Portals: Yahoo!, Excite;**
- **Internet ad brokers: Doubleclick, 24/7 Media;**

Layer 4: on-line transactions

Layer four consists of only those companies that actually conduct web-based trade. As this layer includes all companies that generate product and service sales to consumers or businesses over the internet, we have not included intermediary-type players such as VerticalNet (trade communities) or eBay (on-line auctions) at this level, but placed them in layer three.

- **E-tailers: Amazon.com, eToys;**
- **Manufacturers selling on-line: Cisco, Dell, IBM;**
- **On-line ticketing; American Airlines, United Airlines;**
- **On-line entertainment: Disney.com, ElectronicArt.com;**
- **Subscription-based companies: TheStreet.com, Wired.com;**
- **Shipping services; UPS, Federal Express.**

Many companies straddle several layers

As our lists illustrate, many internet players operate at multiple layers. For instance, Microsoft and IBM are important players in the applications and e-commerce layers, while AOL is a key player in the infrastructure, applications, intermediary and e-commerce layers. Despite this overlap, we feel the layering approach provides a more realistic and insightful view of the internet economy than a monolithic conceptualisation that does not distinguish between different types of activities, especially for the valuation exercise.

Further, the multi-layered approach enables analysis of why companies choose to enter the market at one internet layer, and later extend their activities to other layers.

The big picture

According to the Center for Research in Electronic Commerce (CREC), the internet economy generated an estimated US$579bn in revenue worldwide in 1999, and was responsible for 2.82 million jobs. We believe this figure is largely a reflection of US supply-side momentum.

As we have explained, the internet economy can be divided into four layers. We believe CREC's headline figure should be adjusted for overlap between the commerce layer and the other three layers. We estimate this overlap at US$72bn, implying US$507bn in "clean" revenues and 2.5 million jobs.

Internet economy indicators

Layer	Estimated internet revenues (US$ bn)	YoY Growth (%)	Estimated internet jobs ('000)
Infrastructure	172	50	660
Application	90	61	570
Intermediary	88	52	450
E-commerce	229	127	1,140
The internet economy (excl. overlap)	507	68	2,504

Source: WDR – Center for Research in Electronic Commerce (University of Texas)

- As the infrastructure and application layers are a function of combined investment in the internet, intranets (internal corporate systems) and extranets (inter-corporate systems), they represent revenues associated with internet protocol (IP) infrastructure and applications.
- The intermediary and e-commerce layers capture internet-based activities only.
- Given that less than 10% of corporates worldwide were believed to have their own intranets in 1999, we deduce that extranet volumes were negligible. However, extranet-based business-to-business (B2B) transactions are likely to become more significant in the near future as more electronic data interchange (EDI) based transactions migrate to extranets.

Layer 1: internet infrastructure

Internet infrastructure revenues grew by an estimated 50% to US$172bn in 1999. While strong, this layer lagged the other three layers in terms of momentum. On the other hand, revenue per employee reached US$260,000, the highest of all four layers, and total infrastructure employment rose 39% to an estimated 660,000 jobs.

Many industries saw significant consolidation in 1999, most notably in telecommunication. However, CREC's study showed that consolidation was milder among internet infrastructure companies. The top ten companies represented 44% of total "layer one" revenues in 1999, down from 50% in 1998. Note that eight of the top ten are computer hardware providers and two are internet service providers (ISPs).

Layer 2: applications

The internet applications layer generated over US$90bn in revenue in 1999. At +61%, this was the second fastest growing layer. Internet consulting and web application houses outperformed on the back of demand from companies pursuing aggressive e-business strategies.

CERC's findings for this layer are consistent with the fact that the biggest increases in worldwide corporate IT budgets were on the services line.

Layer two employment grew by an estimated 38% to 570,000 in 1999. However, at US$158,000, revenue per employee is the lowest of all four layers. This is hardly surprising as the business models of internet solution and service companies are generally much more "people-intensive" than those of any other layer.

The applications top ten is made up exclusively of America's largest software and consulting companies. The top ten represented 43% of the total layer two revenues in 1999.

Layer 3: intermediaries

In 1999, intermediary revenues increased 52% to US$88bn in 1999. Growth was strongest in electronic brokerage, on-line travel, portals and on-line auctions, while other intermediaries grew at slower rates. Employment climbed 25% to 450,000 and revenue per employee reached US$195,000.

The top ten intermediaries accounted for just 23% of layer three revenues, albeit up from 20% in 1998. Unlike the other layers, layer three is not (yet) dominated by a few category heavyweights. This reflects the broad range of players at this level, which encompasses resellers, conglomerates, media, brokerages and portals.

Layer 4: e-commerce

Layer four revenues exploded in 1999, rising by 127% yoy to an estimated US$230bn. In by far the fastest growing layer of the internet economy, the pace was set by the US-based companies according to CERC. E-tailers and new entrants such as banks and financial services firms grew strongly. However, long-established PC makers still account for the biggest share of layer four revenues.

This layer accounted for the biggest share of investment in human capital in 1999, with employee numbers rising by no less than 78% to 1.14 million. Although impressive, employment growth still lagged revenue growth. This rise in efficiency reflects the fact that an increasing number of e-commerce systems have moved beyond the start-up phase. Revenue per employee reached US$200,000 in 1999.

The top ten firms in e-commerce represent 32% of the total layer up from 27%. It is interesting that no pure-play internet companies are in the top ten revenue producers in this layer.

Despite sky high valuations, US investors are still keen to invest in internet-related companies

The internet economy now surpasses century-old traditional industries

Internet is now ahead of airlines and catching up with publishing and healthcare

At an estimated US$507bn in 1999, the Internet economy has zoomed past century-old industries such as airlines (US$355bn) in size and is fast approaching the publishing (US$750bn) and healthcare industries (US$1trn). If the internet economy were to grow over the next three years at just half WDR's estimated current rate of 68%, annual revenues would reach US$1.2 trillion in 2002.

The average market cap. of the 300 most active US internet companies is 33 times higher than the NASDAQ average

While the Wall Street mania over dot-com companies has reached epic proportions, a look at 1999 performances show that investors still strongly favour internet-related companies and reward them with their investment dollars. The 300 companies doing the most business on the internet have a current average market capitalisation of US$20bn. That is 33 times the US$600m average market cap for the 5,100 NASDAQ listed companies.

In terms of market capitalisation, WDR's US analysts believe the internet industry is following a pattern similar to that of the PC industry in the early 1980s.

- **In 1994, internet infrastructure valuations ramped with the IPO of UUNet, and the reincarnation of Cisco as the provider of internet plumbing.**
- **In 1995, internet application plays ramped with the IPO of Netscape, and the reincarnation of Microsoft as an internet company.**
- **In 1996, internet intermediaries ramped with the IPO of Yahoo!, and the reincarnation of America On-line as an internet company.**
- **In 1997, B2C ramped with the IPO of Amazon.com.**
- **In 1998, C2C ramped with the IPO of eBay.**
- **In 1999, B2B ramped with the IPO of Healtheon.**

Europe: a different story?

Europe today = US minus three years?

In our view, Europe today is at the same stage as the US was three years ago. Internet penetration remains low this side of the Atlantic, but passed the critical 10% of the population in 1999. We believe this should be sufficient to trigger a sharp increase in corporate investment and to attract even greater investor interest from now on.

We think not

However, we do not subscribe to the view that what is happening in the internet in Europe is more or less a rerun of the US experience minus three years. Why? Because there are a huge number of variables at play in Europe, especially when compared to the US:

- **Internet penetration is unequal.** Greece had the lowest web penetration rate at end 1999, with only 2.6% of the population connected compared to 31% in the leading country, Finland.

- **Usage varies greatly.** Home usage is more common in early-adopter countries such as Finland, Sweden and the Netherlands. In countries with low web penetration, such as Spain and Portugal, access is predominantly from work and school.
- **Web access device preferences vary.** We are currently witnessing the development of inexpensive new web access devices, which look set to democratise access. However, our studies show that while consumers in the Nordic countries are likely to take to mobile phone access once third generation technology comes along, it appears that Benelux users would prefer digital TV or cable access.
- **Language differences:** To reach 70% of the audience in Europe, content needs to be translated into at least five languages.
- **Legislation and regulation are not harmonised.** To give just one example, VAT rates vary between 15% to 25% in Europe. Telco interconnection charges also vary greatly from one country to another.

What does this mean in terms of internet investment opportunities in Europe?

Fresh momentum for internet infrastructure and application companies

The growth dividends should flow to telecos geared for data growth, the big software houses and local consultants

We conclude that internet infrastructure and application players are likely to be the biggest money makers simply because usage is growing in Europe. European telecommunication-related players that are geared up for data growth should excel. European IT companies with large client bases, and emerging local internet consultants could present compelling opportunities. The drivers? We expect 15% of subscribers to traditional European telecom services to migrate to internet service providers (ISPs) by 2003. On top of this, 70% of traffic growth on the same horizon should be driven by internet applications. Our models show that, by 2002, internet/intranet spending should represent close to 30% of total annual European IT investment, implying a CAGR of 67% for service companies and 29% for software houses.

We see upheaval among portals

Too many portals chasing too few users

We believe that there are too many portals competing for what remains a small on-line consumer base dispersed across 15 countries. In our view, the economics –modest on-line ad revenues, low transaction fees, and high cost structures– are likely to drive a large number of portals out of business. While portals have long been the darlings of internet strategists in the US (rewarding their faith with hard dollars), 43 firms are competing for portal business on this side of the Atlantic. Combined they operate 95 broad portal sites. We see room for only five big players in Europe going forward.

Traditional retailers set to capture the lion's share of European e-tailing

Rather than being brushed aside by e-tailers, we expect traditional retailers to go on-line themselves

European retailers have been relatively slow to enter the internet race, and are thus unlikely to gain a competitive edge in the long term over US operators. One of the great advantages of the internet is that it ignores frontiers. So far, European retailer valuations have barely been affected by the internet, but we believe it is only a matter of time before on-line shopping has a significant impact. Nonetheless, we do

not believe that e-tailers will condemn traditional retailers to extinction. Indeed, traditional retailers are at the forefront of e-tailing in Europe.

Business-to-business: a greenfield in Europe

As the B2B model loses its mystique, expect the competition floodgates to open

The B2B market can still be considered a greenfield in Europe. However, we believe that on-line trade will thrive going forward as the advantages of B2B become clear to the rest of the economy. On the other hand, as the B2B operating model loses its mystique, market-makers are likely to face increasing competition. In our view, to survive, these marketplaces must link with other sites (eg, with the sites of related trade journals). The real winners at this level, in our view, are likely to be the e-marketplace hosting companies that can turn transaction flows into valuable, marketable data.

European portals risk a harsh economic awakening

In Europe, we believe that too many portals are competing for what remains a small on-line consumer base dispersed across 15 countries. In our view, the economics –modest on-line ad revenues, low transaction fees, and high cost structures– are likely to drive a large number of players out of business.

Portals have long been the darlings of internet distribution strategists in the US. As company reports show, the nine leading American portals collect millions from e-commerce players like eBay and BankOne by providing access to their huge on-line audiences.

Across the Atlantic, 43 firms –ranging from US invaders like Netcenter to national pioneers such as Ilse– compete for the attention of wired Europeans. Combined, they operate more than 95 broad consumer portal sites vying for a small pool of on-line users scattered across 15 countries.

Forrester's European competitive landscape

The players	Strengths	Weakness
US invaders:	Sector innovators	Differing levels of service in each country
International brands with rich content and commerce partners	Considerable financial resources	
AOL, Excite, Lycos, Yahoo!	Lessons learned from the US	
	Proven technology and tools	
Telco giants:	Massive financial resources	Mimic services rather than innovate
Former PTT's established ISP services	Net access dominance	
SOL, T-On-line, TIN, Wanadoo, TerraNetworks	Business units deliver multi-appliance reach	
	Monopoly of on-line directories and phone guides	
National pioneers:	First-mover advantage	Limited resources
Early entrants with deep understanding of local consumers	Strong brand name recognition with early adopters	Limited traffic and ad revenue from a single national market
Jubii, Nomade, UK Plus, Virgilio		
Free ISP upstarts:	Guaranteed customer base by packaging with net access	Lack content management skills
New players delivering free Web access	PR "darlings"	Focused on Web access business model
Freeserve, HMV, LibertySurf, TiscaliNet		
Technology players:	Knowledge of reformatting on-line commerce and content	Lack content management skills
New players focused on bandwith and net appliances	Early industry movers	Small subscriber base
Chello, EnAvant, Mediaset, Orange		

Source: WDR - Forrester

In Europe, portals often begin life as, or rapidly develop into, broad consumer sites –roping in search capabilities, commercial partners, community links, and news feeds from services like Reuters and AFP. Some compete in multiple countries, while others focus on a single market. Roughly speaking, these can be broken down into two groups, multinationals and nationals:

Multinationals are blanketing the region with localised sites

US invaders like Yahoo! are capitalising on their lofty stock valuations, well-known brands, and proven tools to deploy localised teams and sites into multiple European markets. At the same time, a few telco giants, such as Deutsche Telekom and France Telecom, have begun to move their portals across borders. These big players are localising content from around the world in a bid to entice users back to their sites time and time again.

National players bank on local know-how

So far, the majority of free ISPs, national pioneers, and most telco giants have concentrated on developing portals for one market. In short, they back the view that highly localised content and e-commerce is the key to winning the custom of on-line users in a single country.

Meeting the on-line challenges of Europeans

As portal firms strive to establish operations and build brands, they must confront their greatest challenge: pulling together a mass audience from today's scattering of Net-izens. Europe's on-line population remains small, elusive, and diverse.

Europe lacks critical mass on-line

Net penetration remains low in large markets like France (60 million population) and Italy (53m), while internet penetration is highest in countries like Finland and Sweden that have populations of less than 10 million.

US portals snare European users

Many wired Europeans favour US-based portals. According to Media Metrix's recent survey of Swedish net traffic, MSN.com is the second most-visited site, far ahead of homegrown Passagen at No. 8 –and even the localised MSN.se at No. 31.

Consumers scattered across new devices and sites

Mobile phones, interactive TV, set-top boxes and even traditional appliances are opening new consumer contact points with the net across Europe. Additionally, the proliferation of free ISPs beyond the UK should enable consumer brands like Tesco (supermarkets) and Castorama (home improvement stores) to guide new users on-line before they connect with, say, Sonera Plaza (portal) or Nomade (search engine).

Economic realities set to thin the ranks

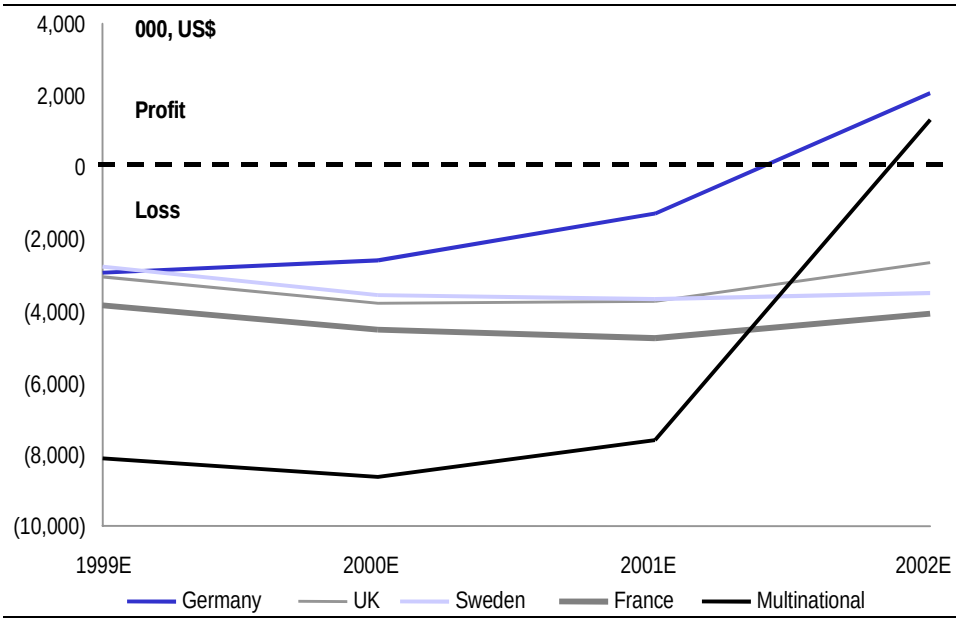
In a market characterised by too many portals serving too few on-line users, some players have moved aggressively to stand out from the crowd: witness Excite's US$5m off-line advertising campaign in the UK. But will this pay off? We think that despite their best efforts, most portals will fail to convert eyeballs into profits. Heavy financial losses should force most contenders to recast their roles on-line –or fold.

European portal economics do not add up for most players

E-conomics do not add up to near-term profits for European portals

Several factors look likely to limit portal revenue streams and keep costs high –which we expect to result in financial losses for years to come. To gauge the impact, we use Forrester's model of average revenues and operating costs for five different portals between 1999 and 2002. The model combines information from 54 e-commerce interviewees with insight and data gathered from in-depth conversations with 30 of Europe's largest portals. Forrester found that the economic outlook for portals is harsh:

Portals face harsh economic realities



Source: WDR estimates, Forrester; Multinational = Portal site serving all four national markets

Costs start steep and grow due to marketing and staff expansion

The cost of staying in the portal game is high…

Forrester estimates that annual operating costs are set to exceed US$3m in 1999 for national portal players and top US$10.6 million for multinationals active in Europe. Marketing typically consumes nearly 50% of both budgets, with staffing –including business development, ad sales, content, and technical personnel– adding another 40%. By 2002, Forrester expects the need for increased marketing, staffing, and content (to grow offerings and stay competitive) to have driven annual costs to over US$5m for a national player and US$17.3m for a multinational contender.

Income remains modest

…but income remains paltry, as do prospects

We estimate that Europe's on-line advertising is set to grow from US$286m in 1999E to US$3.6bn in 2003E –just one-third of the US level on the same horizon even though Europe must support ten times as many portals. The result: national players are, in our view, likely to scramble to earn between US$280,000 and US$1.6m in 1999. Limited by an on-line retail market still in its infancy, we do not expect transaction fees to account for more than US$24,000 of income on average. Ad revenues usually increase as the number and "depth" of site visits grow, but portals in small markets like Sweden are unlikely to earn more than US$1.7m in 2002, on our estimates, which would not even cover estimated costs.

The bottom line bleeds red

Four years of losses ahead in France, Sweden, and UK…

We expect European portal losses in 1999 to range from US$2.8m for players in small markets to US$8.1m for multinationals. In our view, all these portals are set to eat through millions more in cash before their fortunes improve. National French, Swedish, and UK portals look likely to see four straight years of losses, totalling more than US$13m (1999-02). In contrast, the multinationals and the German portals should begin to benefit from greater scale and record their first profits –but not before 2002, in our view.

…and no profits for German and multinational portals before 2002E

Only a few can survive

We expect heavy financial losses and fierce competition to drive most players to abandon their current broad portal strategies. By 2002, Forrester sees 17 winners emerging from today's 43 contenders –two U.S. invaders and 15 European firms.

Yahoo! to leave other US invaders behind

Yahoo! looks likely to be one of the two multinational giants to thrive in Europe…

We believe the multinational giant Yahoo Inc.(US$443) has what it takes to prevail in Europe: market momentum, money, brand clout, and device commitment. Other players, we think, are likely to increasingly refocus on their core strengths, with Lycos (US$78.38) building a network of European community sites, and Excite (US$133) targeting on-line shopping.

…with Lycos and Excite in the running for the second spot

We do not expect AOL (US$77.25) to gain traction in Europe as it diverts portal resources to fight off the assault of free ISPs attacking on core business. The wild card is Microsoft (US$112.63), which shares Yahoo!'s advantages but, in our view, must first aggressively fund and launch a richer MSN offering.

Microsoft's MSN gets our wild card

Telcos should share the spotlight

France Telecom sets a good example for European Telco's targeting a large slice of the portal market…

The major telecom operators have, we believe, what it takes to remain among Europe's portal leaders: substantial cash resources, ISP customer base, and mobile telephony and TV activities. However, survival should not be taken for granted. We believe France Telecom (Eur124) is the example would-be winners should follow. France Telecom's strategy is to rebrand its portals to make them distinct from its ISPs, and thus to attract the broadest user base possible.

…while DT's T-On-line could find fertile ground in Austria but perhaps not further afield

On another front, we expect multinational expansion to produce mixed results. Deutsche Telecom's (Eur67.2) T-On-line should find receptive users in markets like Austria (shared language and background) but may well get the cold shoulder in the Netherlands, where it lacks the cultural ties, access business, and has no telephony heritage to build on.

We expect the rest of the pack to bow out of the broad portal race

Rapid deployment of new tools and services is set to send costs spiralling upward, threatening to push national pioneers out of the portal race

We think that Europe's national pioneers cannot afford to keep up with their bigger portal rivals. The rapid deployment of new tools and services looks set to send costs spiralling upward and push them out of business. In our scenario, some fall prey to telcos shopping for credible brands –along the lines of Telefónica's investment in ¡Olé!– while others transform into community sites. Technology players like Orange, unable to mount credible content plays, could recruit portal winners to provide cobranded services. Free ISPs are likely to follow suit as they step back to focus on competition in their access businesses.

Winners to reshape Europe's portal business

In the drive for critical mass among Europe's growing, but still scattered, on-line population, we expect the winning consumer portals to take advantage of lean years to expand their business model. This is likely to entail a shift of focus away from a single web presence, ie, evolving into distributed portals that bridge devices and complementary sites with their services.

Offerings to extend across devices

Life beyond the PC…

The rise of new net devices such as wireless application protocol (WAP) cellular phones, in our view, should compel European portals to reconfigure their content, commerce, and communities. The trick? To dynamically deliver a mix of services based on each device's capacity and "personality". Moreover, to boost revenues from the new interfaces, we believe portals are likely to increasingly look to networks like DoubleClick to create efficient advertising and sponsorship packages across device offerings.

We expect portals to syndicate services to other net businesses

…and beyond the simple portal concept

To further boost income, we expect portals to leverage one of their most valuable assets, namely the on-line credibility of their brands. To do this, they could provide a range of co-branded net services for use on everything from home pages provided by free ISPs to corporate intranet sites, thereby leveraging their community-building and search expertise.

What does all this imply?

Users to look increasingly to portals for function, not content

Content likely to be superseded by functionality as the key selling point

As portals broaden to serve multiple devices, we expect their core value for users to shift from the aggregation of content to the delivery of functionality. Our central view is that users will invest time and effort to customising functions for optimal performance, whatever the device they choose, and their lifestyle needs. Ultimately, this relationship should enable portal winners to lock in users (increased loyalty) and to collect richer customer profiles. Yahoo! plans to offer such data back to partners like HMV (the record label and multimedia store chain) as proof that portal deals can meet their needs for better targeting –at a premium price.

We cannot see US-style mega-deals materialising in Europe.

Rather than greater concentration through mega-deals, we expect a complex structure of deals

Although we expect a few newcomers like BOL to initially invest heavily on huge portal deals in a bid for visibility, the mainstream is more likely to sift through opportunities created by ISPs and new content providers rather than bet on any single site. The emergence of portal winners in the longer term could splinter commitments even further –as the likes of Unilever, Merita Bank, and Nestlé create a spider's web of deals and payments to suit each national market, device, and cobranding opportunity. In such a scenario, we would expect MSN to learn to earn its money from the breadth, and not just depth, of its key deals.

Europe's portal winners set to conquer emerging net economies.

The ability to reach a scattered on-line consumer base through multiple devices would, in our view, provide European portal winners with an advantage over their American rivals as both expand globally. Young internet markets where mobile phone use far outstrips PC ownership (eg, Eastern Europe and Latin America) should provide fertile ground for expansion. We expect the combination of Téléfonica and ¡Olé! to best US-based competitor StarMedia in vying for Latin American portal business.

E-tailing and retailing in Europe

Although European e-sales remain low in absolute terms, a simple extraction of US trends makes it clear to us that on-line shopping will become a force to be reckoned with in Europe. The Old World is lagging the New by three to five years but is now entering the stage where the internet cannot be ignored.

European retailers have been relatively slow to enter the internet race, and are thus unlikely to gain a competitive edge in the long term over US operators. So far, European retailer valuations have barely been affected by the internet but we believe it is only a matter of time before on-line shopping has a significant impact. Nonetheless, we do not believe that e-tailers will condemn traditional retailers to extinction. Indeed, traditional retailers are at the forefront of e-tailing in Europe.

Lessons from America

Already in the picture

As far more homes are already hooked-up to the web in the US than in Europe, we can get a good idea of the potential impact of the internet on European retailing simply by looking at the US experience.

On-line retailing really took off in 1998

On-line retailing really took off in the US in 1998. Although reliable data is scarce, on-line retail sales reached US$5.8bn in 1998, compared to US$2.6bn in 1997 (note that these figures exclude car and real estate e-sales). Even so, US$5.8bn is still modest, at a bare 0.5% of total annual US retail sales. Nevertheless, this 223% surge indicates the increasing penetration of the internet at the household level.

E-tailing in the US

(US$ m)	1996	1997	1998	1999E	2000E	2001E	2002E
Sales	700	2,600	5,800	9,900	15,600	24,500	37,500
% growth	N/A	+371	+223	+171	+58	+57	+53

Source: Jupiter Communication, excludes cars and real estate

e-tailing is here to stay

It is obvious that e-tailing will continue to grow in the US but it is almost impossible to figure out at what level it will stabilise. Recent studies indicate a target of US$37.5bn in 2002 (or 3.2% of total retail sales), but the outcome could be a tad lower … or much higher.

Internet brands have made a breakthrough in the US

What is also striking is the high level of consumer awareness of internet companies in the US. According to a survey by US-based Opinion Research, seven internet-related brands were recognised by more than 50 million American adult consumers in 1998, namely Yahoo!, AOL, Amazon.com, Netscape, Priceline.com, Infoseek and Excite. Considering that the oldest of these companies, AOL, was founded in 1985, this demonstrates the strength of the internet. All the more so given that most of the companies spend relatively little (in absolute terms) on offline marketing. Note that Amazon.com is the only on-line retailer among these companies.

Convenience and unrivalled access to information

Apart from PC ownership, the key drivers of e-tailing are convenience and access to information. However, mail order is also convenient but has never exceeded 5% of the retail market in any developed country. Significantly, though, the 5% mark has been reached in Germany, the least consumer-friendly country in Europe.

Convenience is not enough – service must be added to the mix

Convenience is more than just home delivery, with factors such as avoiding crowds at peak periods (eg, Christmas) also at play. In this context, note that AOL reported that its subscribers spent over US$1bn on-line in December 1998, and some US sites reported severe difficulties with meeting demand over Christmas 1999.

Consumers will expect service

While we agree that convenience is important, there is far more at play than this factor (otherwise mail-order would already be the major retail channel). In our view, a high level of service is vital if an e-offer is to work.

- **Service could entail offering a far broader choice than is available in 3D stores, which is typically the case for book e-tailers.**
- **Service could also mean offering browsing tools to help customers make choices. Both CDnow and Amazon.com allow shoppers to listen to excerpts of CDs (assuming their PCs are sound-equipped), read the critics' views of records and books, and suggest books and CDs related to the topics customers may be interested in.**

In a nutshell, in e-tailing, service is all about providing shoppers with far more information (and therefore choice) than is available from traditional retailers. However, these factors alone do not guarantee success.

E-tailing will not work without the right pricing and virtual location

Attractive pricing …

More than convenience and information is needed to establish a successful e-tail site. As in 3D retailing, pricing is also key. Customers like service and convenience as long as they do not feel they are paying too much for it. While pricing is not a real issue for intangible products (eg, travel), it is a different story when goods have to be delivered to front doors. Shipment implies significant costs. All things being equal, e-tailers may not necessarily be able to offer better prices to shoppers.

… and a good virtual location are key

It could be argued that low fixed asset bases give e-tailers a real advantage. Growth for traditional retailers usually means opening new stores, whereas an e-tailer simply has to add relatively inexpensive server capacity. However, there is a major flaw in this argument in that an e-tailers' fixed assets are mainly related to advertising. An e-shopper will not drop in on a site if he is not told about it. This is why a good virtual location is probably as important for an e-tailer as a good catchment area is for a traditional retailer.

Today, a good location is a link-ad on a leading portal's front page

So what is a good location on the web? A good location is one that customers have to use, the equivalent of being close to a motorway exit, next to a large city. A link-ad (click and you go straight to the e-shop) on a leading portal or internet service provider (ISP) is a good location. Being the retail partner of AOL in the US or Freeserve in the UK means your retail product will be accessible to their huge customer bases – the equivalent of a prime high street or mall location.

However, this comes at a cost for e-tailers, which we expect to rise in the future as the internet audience grows. For example, in 1997 Amazon.com paid US$19m to be AOL's leading book-link for three years. Very recently, First USA, the largest credit card issuer in the US, struck a US$500m five-year privileged link deal with AOL. Going forward, we expect the rules of the e-ad game to be similar to those of traditional advertising. Tariffs are likely to be increasingly set in direct relation to each portal/ISP's audience, and they are unlikely to be cheap. Again, this raises questions about the potential returns of e-tailing.

Tomorrow, a good locations may be a link on a retail hub

In the longer term, we believe that awareness of the leading e-tailers will reach a sufficient level to enable them to attract shoppers without recourse to middlemen. If, as we expect, a handful of big retail hubs emerge on the internet, they are likely to be far less dependent on portals than e-tailers are today. We get the impression that Amazon.com is pursuing a hub strategy by investing heavily in publicity (not only on the internet but also through the leading classic media) and by gradually adding to its product range (from books to CDs and videos, to e-auctions and a stake in e-tailer Drugstore.com).

Breaking the trade-off between 'richness' and reach

The retailing equation: price *or* service

Off-line retailers usually have two choices: either sell to a maximum number of customers but provide a minimum service (eg, a book section at a hypermarket) or serve a small number of customers with a high level of service and choice (eg, a good specialist bookstore).

The e-tailing equation: price *and* service

The internet allows retailers to serve many customers simultaneously while providing a potentially enriching shopping experience. For example, Amazon.com can provide a huge number of shoppers with advice and the chance to read extracts from a wide selection of books or listen to a few bars from most of the CDs in its catalogue. Thus, Amazon offers all the advantages of proximity while its pricing is among the lowest in the market.

E-tailers know their clients

Another big plus of e-tailing is that it facilitates data-mining, giving e-tailers the chance to learn much more about their clients' tastes and frequency of purchasing compared to most traditional retailers. As a result, it will be relatively easy for e-tailers to use direct marketing techniques (e-mail) whenever they spot an opportunity to attract a client back into their virtual store. e-tailing makes it possible to tailor messages to suit individual shoppers (if a customer has bought jazz books, chances are he/she would like to hear about the latest jazz CDs) and so generate traffic at a marginal cost.

On the road to customised virtual stores

Sooner or later, we believe e-tailers will be able to create personalised stores, tailored to each shopper's tastes. Amazon.com has already said it is planning to move in this direction in the coming months/years.

E-tailing versus retailing: what will work and what will not?

Despite the obvious appeal, we believe it would be foolish to expect on-line shopping to become the norm rather than the exception. After all, mail order has never amounted to more than 5% of retail sales in Europe. Nevertheless, e-tail seems bound to make a difference in some product categories and will find its place in the retail scene.

Human beings are still social animals

We should not lose sight of the fact that traditional retailing has plenty of advantages that are unlikely to disappear. First, human beings are still social animals, preferring, for example, to have dinner in a fashionable but crowded restaurant rather than to eat alone in an empty restaurant. Moreover, most shoppers like to see, handle, try on and discuss products before they buy. Therefore, just as home-delivery did not kill off the restaurant, people are unlikely to do all their shopping from home.

E-shoppers are like you and me, they are not a special breed

While it is fairly safe to say that there is no significant difference between the typical e-shopper and the typical traditional shopper in the US, at present the typical European e-shopper is predominantly male, aged 15-35, well-educated and mostly urban. However, we expect this skew to disappear in Europe as the home PC becomes increasingly ubiquitous.

It would be unwise to base projections of what will e-sell on mail-order patterns

Products that sell well through mail order catalogues will not necessarily sell well on-line, or vice-versa. For example, books and CDs are among the most internet-friendly categories but have never been successfully traded via mail order (except through book clubs). On the other hand, clothing sells well through catalogues but it is still far from clear whether apparel will sell in sufficient quantities over the internet.

Big sellers on the Net promise negligible delivery cost/gross margin ratios

Beyond volume, success on the Net is a question of getting both the economics and the convenience factor right. Economics because delivery costs should be low enough to make on-line shopping a viable option for both customers and retailers. In this context, the appeal to e-tailers of goods that yield high gross margins but cost relatively little to ship is obvious.

E-tailing versus retailing

	Gross margin	Additional e-delivery costs	Convenience versus traditional retailer	Comment
Food	20-25%	High	Neutral	May work for specific categories or targets: upmarket goods, affluent shoppers. Pricing would probably be a problem for mass market goods
DIY	30-35%	High	Low	May work in some areas (gardening)
Books/videos/CDs	25-40%	Low	High	Bigger assortment, more service, especially technology
PCs/electronics	10-30%	Neutral	Neutral to high	Good fit with internet users
Furniture	40%	Neutral	Low	
Apparel	50%	High	Low to neutral	
Drugs	>50%	Low	Varies	Very convenient for long-term treatments, otherwise not so
Opticals	70%	Low	Low for frames, high for lenses	

Source: WDR estimates

E-commerce looks set to become the key for selling 'intangibles'

A story of gross margin per cubic centimetre

To sum up, the products with the highest absolute gross margin per cubic centimetre are most likely to succeed on the internet. In our view, four types of goods or services fit the bill:

1. Intangibles such as travel and insurance

Intangibles, such as travel, insurance and stocks, are likely to be economically viable on the web because there is no physical contact involved. In the US, there is no longer anything unusual about using the internet to buy stocks (Charles Schwab, E*Trade) or to book a holiday or flight (Biztravel.com, etc).

2. Small products such as CDs and books

Products that are relatively small (ie, not costly to ship) and suitable for an information/value-added marketing approach are likely to be economically viable on the web. Books, videos, CDs and drugs fit this bill, not least because of the plethora of choice.

3. Bulky, big-ticket items, including household appliances and even cars

Bulky big-ticket items that include home delivery as part of the price are likely to be economically viable on the web. This category includes white and brown goods, furniture, electronics and even automobiles. However, e-tailers may have to use bricks-and-mortar showrooms as part of their strategy to market a lot of these goods.

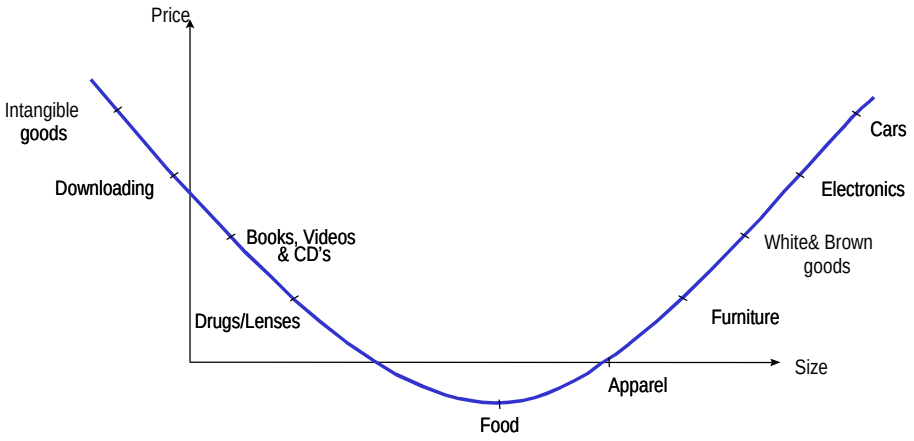
4. E-delivery

Last but not least, goods that are easier to provide through the internet than through other sources are likely to be economically viable on the web. Software today, music and videos tomorrow. Going forward, downloading looks set to trigger a sea change in the music and film industries. For example, it is already possible to download entire CDs using MP3 compression technology, which shrinks digital audio-files to one tenth their normal size.

Food is an unlikely candidate for mass e-tailing

In contrast, food (20-25% gross margin) is an unlikely candidate for mass e-tailing, not least because of weight issues and the complex supply chain (imagine trying to manage simultaneous delivery of frozen foods and dry goods in a crowded city). Clothing does not look a good bet either and it is hard to imagine the Net outperforming mail order. After all, it will not allow shoppers to try on the clothes either.

Spectrum of e-tailing suitability



Source: WDR

We already see these trends at work in the breakdown of internet sales in the US, where travel and PC/electronics account 30% of internet sales each (although the internet does not command a truly significant share of either market yet). The internet has also become an important channel for marketing automobiles.

The most striking success is books, with the internet already representing 5% of the US market. We expect products such as CDs and videos to follow suit. Amazon.com's book sales already amount to 17% of Barnes & Noble's, the leading traditional US retailer, and we expect this figure to rise to 30% in 1999.

Breakdown of US internet sales (1998)

Category	Total sales (US$ m)	% of total internet sales	internet as a % of total category sales
Travel	1,800	31	0.8
PC/electronics	1,800	31	3.1
Books	700	12	5.0
CDs	100	2	0.6
Videos	100	2	na
Software	200	4	1.3
Apparel	300	6	0.2
Grocery	300	6	0.1

Source: Jupiter Communication, Warburg Dillon Read

E-conomics of e-tailing: cash and losses

Pure e-tailers versus multi-channel retailers

Can retailers become e-tailers?

Which of the traditional retailers could become major e-tailer players? The question is worth asking, as many of the traditional players have the financial resources to sustain the early losses typical of e-tailing and the sector know-how to make a go of it in the long term.

On-line retailing is often viewed as an alternative to traditional retailing, rather than a complementary channel. However, the US experience shows that multi-channel retailers achieve 62% of on-line sales. Multi-channel retailers are those who started off as traditional stores, cataloguers or call-centre retailers and now sell through both physical and virtual channels.

Multi-channel versus pure-play retailers (1998 revenues)

Category	Multi-channel	Pure play
Event tickets	100%	0%
Financial brokerages	90%	10%
Consumer Electronics	87%	13%
Apparel/Sporting	85%	15%
Flowers/Cards/Gifts	80%	20%
Home/Garden	79%	21%
Computer hardware & software	77%	23%
Toys	63%	37%
Department stores	47%	53%
Travel	45%	55%
Food/Wine	44%	56%
Music/Video	31%	69%
Books	13%	87%
Automotive [1]	1%	99%
Collectibles	0%	100%
Total	**62%**	**38%**

Source : WDR – BCG [1] Automotive's referral fees only

Where each channel spends

Data supplied by retailers reveals that pure-plays are investing more heavily in marketing and advertising than are multi-channel retailers. In 1998, marketing and advertising spending accounted for 76% of pure-play revenues compared to only 13% of multi-channel revenues. This reflects the fact that multi-channel retailers are able to leverage existing marketing efforts by simply adding their URL to advertisements and promotional material at little or no incremental cost.

As long as the cost of gaining a customer is lower than the lifetime value of that customer, retailers should continue to grow their customer bases

In our view, some multi-channel retailers may be under-spending. Many of them do not appear to be adequately valuing first mover advantage and the lifetime value of the customer when they budget for marketing investments. As long as the marginal customer acquisition cost is less than the discounted lifetime value of the customer acquired, retailers should continue to rapidly grow their customer bases over the longer term, despite losses in the short term.

Spending most on customer acquisition

Most of the leading on-line retailers actively manage the allocation of their advertising and marketing spend across three fundamental areas: customer acquisition, brand awareness and customer retention.

Customer acquisition dominates internet advertising

Advertising expenditure (%)	Multi-channel	Pure-play
Customer acquisition	51%	58%
Brand awareness	33%	39%
Customer retention	16%	3%

Source: WDR – Shop. org

Pure e-tailers might be wise to follow the example of multi-channel retailers and focus more on retaining customers and less on acquisition

This divergence signals that multi-channel retailers, conscious of the significant customer acquisition costs inherent in on-line retailing, are carefully guarding their investment. In contrast, pure-plays appear to be overlooking retention and focusing disproportionately on customer acquisition. Given the high cost of acquiring customers, pure-play retailers should, in our view, be focusing more on retention to realise a return on their customer acquisition investments.

Customer acquisition costs remain high

Customer acquisition costs can range from US$108 for newcomers to US$29 for established players

Multi-channel retailers who participated in a 1999 survey carried out by shop.org reported an average per customer acquisition cost of US$22, while the figure given by pure-play retailers was US$42. For nascent retailers —less than US$1 million in annual revenues or less than one year operation– the average cost per customer acquired was US$108 compared to US$29 for established retailers.

The survey highlighted how mutli-channel retailers are leveraging their existing customer base and encouraging them to migrate on-line in an effort to capture an even larger share of their spending. The associated cost to these multi-channel retailers is significantly lower than the cost of acquiring completely new customers.

The case for outsourcing

Traditional retailers often lack the site skills of pure plays, while pure plays often lack the back office expertise of B&M retailers

To remain competitive, on-line retailers often find it necessary to outsource all or part of their operations, either because they do not have the in-house resources needed to get to market quickly, or they lack expertise. For traditional retailers with strong back office and fulfilment functions, this often means outsourcing web site functions. However, for pure-play companies whose expertise lies in web site development and maintenance, this often means outsourcing back office functions.

For most functions, the cost of outsourcing operations is currently greater than the cost of in-house operations. One reason for this is that outside suppliers are operating in an environment of short supply, causing a short-term increase in prices.

Though outsourcing may cost more, traditional retailers (and even pure e-tailers) may well prefer to focus on core operations and leave speciality functions to speciality suppliers. Web site development and maintenance are outsourced more often than any other function, for good reason: it is difficult and expensive to attract and retain top talent. Often companies lack the range and diversity of in-house skills to deal with graphic design, security, back-end integration with IT systems, etc.

On-line retailers: outsourcing functions

		% total	
		Multi-channel	Pure-play
Back Office functions	Inventory/Warehousing	20	57
	Picking/Packing	51	25
	Customer services	13	8
	Product returns	38	11
Website functions	Site development	26	52
	Site maintenance	14	32

Source : WDR – Shop.org

The ability to fulfil orders is key

Fulfilment: cataloguers and pure-plays doing best

Fulfilment – the ability to get the right order to the right customer on time- is the nuts and bolts of serving the customer. To date, catalogue retailers have performed best in the area of on-line order fulfilment by leveraging their direct-to-consumer infrastructure and expertise. As cataloguers' fulfilment systems are already at scale, on-line orders can generally be handled efficiently.

In contrast, bricks and mortar retailers appear to be struggling in this area. Early attempts to layer direct-to-consumer fulfilment onto assets designed for shipping truckloads to stores have yielded poor results. On-line and in-store operations are so different for most products that the two cannot economically be accommodated by the same systems and processes.

One result has been an average back order rate of 11% (ie, returned orders), which is higher than the rate for pure-play retailers (9%) and almost twice as high as catalogue retailers' on-line operations (6%). Many bricks and mortar retailers have responded by reconfiguring existing facilities or, in many cases, building an entirely new facility for their on-line channel.

Pure-play retailers appear to perform almost as well as catalogue retailers. From the outset, their infrastructure is designed for direct-to-consumer fulfilment. But they are still learning the ropes, and over 200% growth in orders is testing the scalability of their fulfilment operations.

Whatever the losses, e-tailing generates cash (today)

E-tailers tend to lose serious money …

While the appeal of the web for customers is fairly obvious, it is harder to gauge the economic viability of internet retailers. To have any hope of creating value, internet retailers must strive to build a significant client base, but this entails huge outlays on marketing relative to their (initial) size. The most successful internet retailer, Amazon.com, made a US$124m loss in 1998 on sales of US$610m, and we do not expect it to show a profit before 2002. Other players, such as CDnow, are racking up losses amounting to c50% of sales, due essentially to high marketing costs.

… as they invest heavily to build their brand

The trick with e-tailing is to offer competitive prices, and compensate for this by gaining critical mass and thus squeeze better purchasing terms from suppliers. The drawback is that the internet is also an extremely efficient 'price equaliser'. A decent search engine is all a customer needs to find the best price on the net almost instantaneously. Hence, our view that no more than two or three players will survive long term per product category.

They also tend to have a lot of cash at hand

On the other hand, in spite of inevitable losses in the early stages, e-tailers are all cash generators and thus unlikely to become insolvent. Typically, e-tailing requires negligible fixed assets and generates a sizeable negative working capital flow, thanks to low inventory requirements. In Amazon.com's case, US$30m was all that was needed to build a US$600m business while a traditional bookstore chain would have needed to spend some US$300m to achieve a similar level of sales. As a result, the company had a negative capital employed position until it made acquisitions recently. Moreover, in the US at least, venture capital companies and the financial markets are often willing to fund the initial losses of e-tailers.

Therefore, given the cash generative and cash raising powers of the internet, e-tailers should survive huge losses. Capital is allocated to advertising (thus creating an intangible fixed asset, ie, a brand) rather than to fixed assets.

This mix of losses and cash gives e-tailers space to establish their concept

Overall, rather than concentrating on straight profits, a look at e-tailers' cash cycles may provide a better understanding of the underlying strategy. Nevertheless, at the end of the day, these companies will have to generate earnings when growth slows and the NWC trick no longer yields enough cash to cover operating losses. At the outset, however, e-tailers have time to build trade (or to disappear) and disrupt traditional retailers.

At this stage, the only conclusions we can draw from this are: (1) the internet works well for cultural products; (2) we have no idea when e-tailers will make money (or how much); and (3) the expansion of e-tailing in itself poses a problem for traditional retailers.

A serious headache for traditional retailers

Why is e-tailing a problem for traditional retailers? Because this new competition may force them to launch their own internet services, especially as this new retail channel may absorb all the growth in some markets.

True, what retailers lose in sales at their stores, they could get back through the net, but this is unlikely to be an even sum at the earnings level (a classic case of 1+1 being less than 2). Barnes & Noble launched its barnesandnoble.com service in a defensive move, losing around US$56m on sales of US$85m in 1998 through this channel. However, these losses are likely to be covered by Berstelmann (which took a 50% stake for US$200m) and the stock market as an IPO looks likely in the near future.

What is happening in e-tailing in Europe?

Few serious e-tailing initiatives so far

Potential European e-players have proved to be less proactive than their US counterparts. This probably reflects both a lack of enthusiasm (and resources) among the European venture-capital community and a lack of interest by traditional retailers (why bother when e-tailing is less than US$500m per annum in Europe?). So far, so good for European retailers: if nobody moves, then why bother?

If European players stand on the sideline, US players are likely to rush in

However, as the internet brings down national barriers, it could create outstanding opportunities for US e-tailers to storm European markets, especially as they would face no real mass-market competition. Given that their business model is likely to be five years ahead of any local rivals, US e-tailers would have a real competitive edge (not least long experience and lower R&D costs). Obviously, they will have to establish a logistics infrastructure in Europe but the front office will need very little additional know-how and capital expenditure. For example, Amazon.com is already seriously expanding in the UK and Germany.

So far, European e-tailing initiatives fall neatly into three categories: (1) ISP launches; (2) e-tailing knowledge building; and (3) setting up e-tail sites.

1. ISP launches

A relatively safe way to enter the internet

In the current context, launching an ISP looks like the safest e-tail strategy for Europe. Little investment is required (we estimate no more than US$15m) and returns are relatively rapid. The trick is to create an internet access portal to attract 'surfers' (either paid, like AOL, or free).

Dixons opted for the free access path

In the UK, Dixons is having outstanding success with its Freeserve ISP

Dixons took this path in the UK with its resoundingly successful Freeserve site. The site signed 1m subscribers in less than six months, simply by offering free access, making it one of the most popular ISPs in the UK alongside AOL. As a result, Tesco was forced to offer free access to its own site, which predates Freeserve. Freeserve is economically viable because it collects fees from telecos on the telecommunications traffic generated by its subscribers and it also makes money by selling e-advertising space.

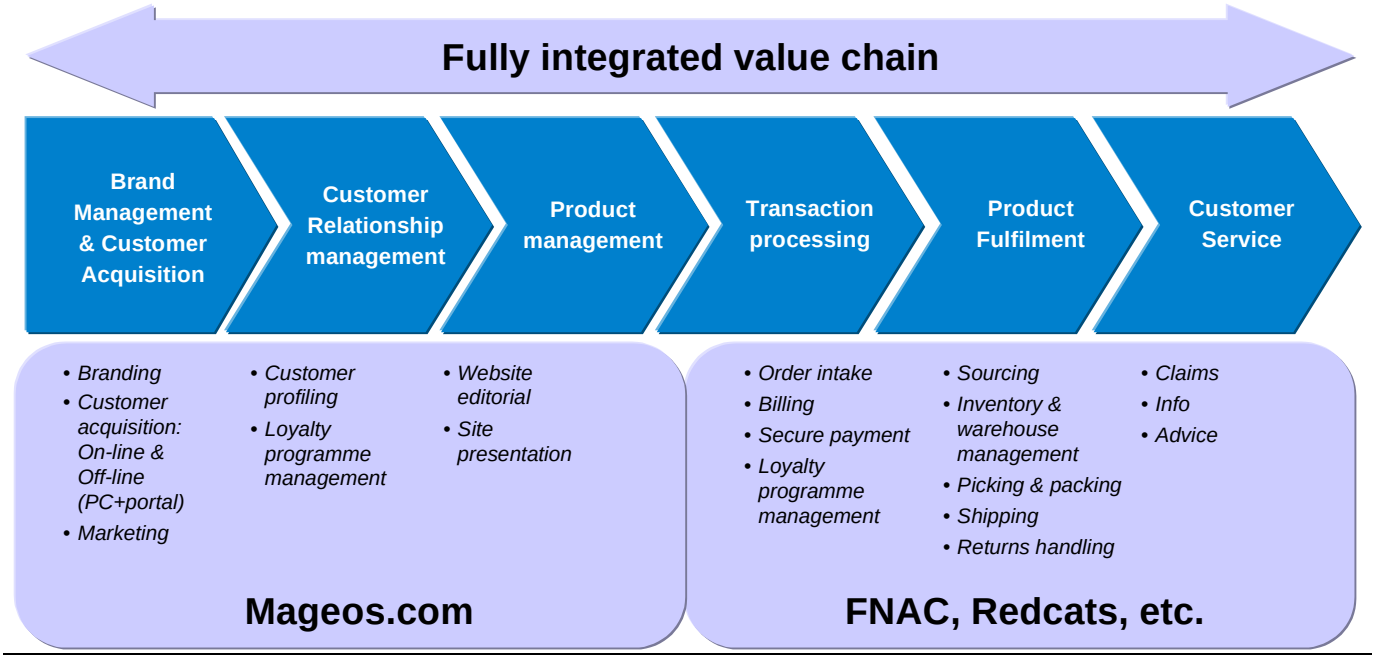
However, there are now 70 free ISPs in the UK and some will never make a return. Hence Dixons' strategic decision to pump any profits from Freeserve back into the site (more spending on e-ads, content and server capacity), and our view that the ISP may do no better than breakeven in 2002.

PPR: covering the entire value chain

PPR is aiming to cover the entire value chain

France's PPR has opted to go further than Dixons by aiming to position itself right along the e-commerce value chain, which translates as: (1) PC sales (incorporating the portal) through the group's high-street brands; (2) building a subscription base through the Mageos.com portal/free site; (3) using the free site to direct traffic to the group's on-line shopping sites; (4) using the group's existing logistics infrastructure to support the site, thus keeping costs down.

PPR Interactive



Source: WDR

- PPR controls approximately 25% of the French PC market through FNAC and Conforama (FFr3.5bn sales at FNAC, FFr0.5bn at Conforama in 1998, with a CAGR of c30% pa). As every customer that buys hardware at these stores will now be offered free internet access, Mageos.com's running costs are unlikely to be inflated by abundant advertising.
- The Mageos.com portal/free site was launched in November 1999, initially serving 170,000 subscribers of FNAC.net, which will migrate to the Mageos portal. Beyond free access, the site will offer classic portal services such as search engines, e-mail addresses and on-line shopping links. True, PPR is a latecomer. Nevertheless, we believe it should have little difficulty establishing Mageos.com given the extensive network of retail salesmen that will be directing traffic its way, not to mention the attractions of an already rich content.
- Not only will Mageos.com work in partnership with the group's existing internet sites, it also plans to recruit external partners to complete the offer (the wine merchant Chateauonline.com for example). At the same time, PPR intends to refresh its existing on-line businesses, notably the FNAC and Redcats sites. The FNAC site was re-launched on the new portal in November with much improved content (stronger editorial input and more attractive marketing tools such as complete product descriptions rather than the current scant summaries). At the same time, Redcats will endeavour to migrate more of its catalogue business away from the mails and onto the Web (it already has 25 sites up and running).
- By leveraging its existing infrastructure and mail-order know-how, the group should be able to trade on the net at little extra logistical cost. Thus the start-up costs should be relatively modest in comparison with pure internet start-ups. Moreover, PPR may well provide logistical support for independent on-line retailers, and thus further reduce the break-even point for its internet business.

2. E-tail knowledge building

Little cost but not value enhancing

The 'knowledge' way into e-tailing is probably the least costly solution but also the least value-enhancing strategy in the short term. France's Galeries Lafayette fits into this category, thanks to its 90%-owned subsidiary, Laser.

Galeries Lafeyette's Laser is a prime knowledge builder

Galeries Lafayette: one of the most knowledgeable companies as regards the internet

Laser has three subsidiaries: (1) the very profitable consumer-credit company, Cofinoga; (2) Mag-Info, which offers data-processing services to retailers; and (3) e-Laser.

E-Laser is not only exploring the opportunities of e-tailing and working to establish Galeries Lafayette on the Net, it is already e-tailing through its Telemarket subsidiary. Unfortunately, the latter mostly trades in food products – a category we believe is unlikely to make a worthwhile breakthrough on the internet. (Note that Telemarket was, and still is, designed for France Telecom's proprietary Minitel system, a simplified version of the internet, launched in the early 1980s and restricted to France). However, e-Laser's c-link unit is working on schemes to improve customer loyalty by using interactive media.

3. Becoming an e-tailer

Many European retailers have launched virtual stores although none of them, in our view, has got very far. Most initiatives have been in the cultural products and apparel sectors.

Cultural products

A number of initiatives in Europe appear to have been inspired by Amazon.com's success in the US. For example, PPR's FNAC (CDs-to-electronics retailing) has established a site but sales are still lacklustre (less than e10m but 40% of the market) and its content is weak, in our view. There are also some start-ups in France, such as Alibabook (recently acquired by France Telecom). In Italy, media group L'Espresso (newspapers, radio) has created a joint venture with unlisted book retailer Feltrinelli, to sell books over the internet. In Scandinavia, pure e-tailers Bokus, Boxman and MTG have had some commercial success. In our view, most of those companies will eventually face competition from Amazon.com.

Apparel

The most advanced clothing sites in Europe so far are those developed by H&M in Scandinavia and Karstadt in Germany. H&M's site looks the most ambitious as it goes beyond proposing products by offering fashion advice. However, so far this site only serves Swedish customers. Its 'traffic' remains modest at just 45,000 visitors a month on average versus 170,000 for the leading book e-tailers in Sweden. Karstadt was a fairly early arrival with its 'my world' website, launched as long ago as 1996. However, we do not find this site very customer-friendly.

Other initiatives

Several European food retailers are known to have looked at the web, but apparently have decided it does not have much to offer them – rightly in our view. Nevertheless, Casino in France, Alcampo in Spain and Jeronimo Martins in Portugal have set up e-services. However, as discussed earlier, high delivery costs look likely to deter most consumers. For example, Jeronimo Martins charges e9 per delivery, which probably means customers will only use the service on special occasions.

As regards big ticket items, Sweden-based furniture retailer Ikea is now selling some products on the internet. To help customers choose, its site allows them to create virtual models of their homes and then place items in their 'own' rooms. Ikea has yet to release detailed results.

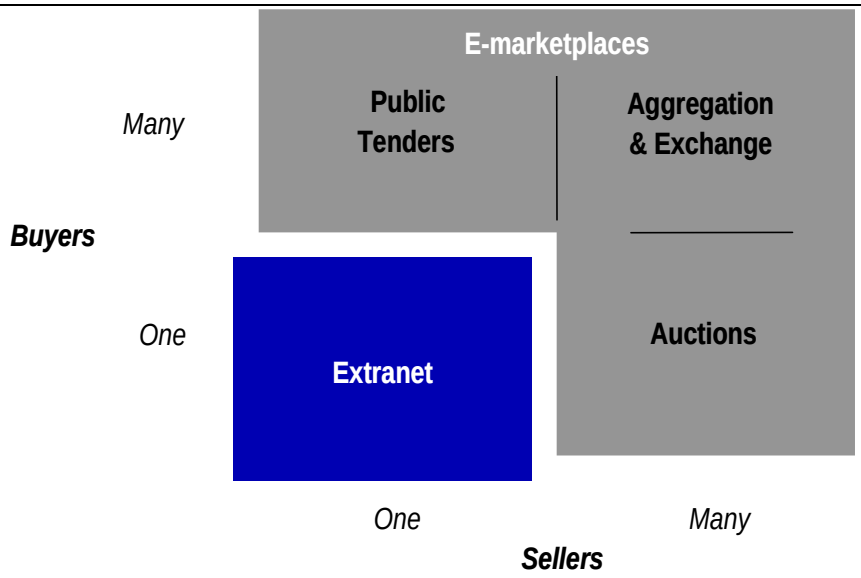
From our perspective, the most curious 'on-line' diversification is the Viaplus joint venture between Spain's Tabacalera (75%) and Cortefiel (25%), which launched a network of 'high street' interactive terminals at sites in small towns in 1999. These machines offer lines such as books and toys. Viaplus' long-term target is to carry one million items in its e-catalogue. The terminals are located close to tobacconists, supermarkets and banks. Viaplus sees room for more than 15,000 units going forward. Although the idea may be surprising, we believe that Viaplus is aiming to take advantage of the negligible penetration of mail order in Spain. Note also that the JV plans to offer its goods on the PC web in the future. At this stage, we are not that enthusiastic about the project.

B2B: electronic marketplaces

Externally hosted web sites look likely to become indispensable B2B go betweens

Over the next decade, we expect one of the main themes to be the electronic integration of business processes across the supplier- customer-trading chain. In this respect, the internet is set to break down the boundaries between individual enterprises. At present, inter-enterprise on-line transactions are growing on the back of externally-hosted electronic marketplaces. These allow participants to hook onto a standard transaction platform rather than having to establish a vast number of individual bilateral links to a vast array of buyers and sellers (as is the case currently with EDI).

B2B landscape



Source: WDR - Forrester

Virtual markets can lead to greater efficiency and lower costs

What are the benefits for participants in these virtual marketplaces? In a nutshell, greater purchasing efficiency and reduced operational costs through the streamlining of procurement procedures. By integrating its system with, say, a customers' back-offices, corporates can automatically direct data flows on on-line transactions to the relevant financial, logistics and manufacturing management modules.

Such data can include product, customer and payment details, order volumes and delivery dates, to name just a few examples. Once everything is in place, integrated marketplaces should allow businesses to reduce order cycle times by automating purchase authorisation, accounting and other contractual transactions.

A choice of marketplace

B2B e-marketplaces can be divided into three categories:

- **Company-centric marketplaces**
- **Vertical industry-centric marketplaces**
- **Horizontal cross-industry marketplaces**

At this early stage, it is fairly easy to identify relatively pure forms of each type of e-marketplace. Longer-term, we expect dividing lines to become increasingly blurred.

Company-centric marketplaces

These initially closed systems have the potential to evolve into open-tender environments

Typically, company-centric virtual markets are custom-built for a large original equipment manufacturer (OEM) manufacturer/assembler to hook its suppliers into its own IT system. Initially, company-specific or supply-chain-specific marketplaces are usually closed to the OEM's long-standing community of suppliers. Opening up to third-party suppliers (ie, a tender system open to all) becomes a real option once the virtual marketplace reaches maturity.

Oracle and Commerce One have recently announced deals to create such environments for Ford and General Motors respectively. We will take a closer look at these deals later.

Vertical industry-centric marketplaces

Ideal for B2B^{pu}

Vertical marketplaces provide trading platforms for a specific industry, and is ideal for B2B^{pu} trade. The chemicals, energy, steel, engineering and high technology industry all look well suited for this type of e-activity. While the number of participants is likely to be small, transactions are likely to frequent and complex, and thus highly valuable.

SAP is at the forefront of vertical…

Examples of industry-specific marketplaces are Chemdex Corp for the chemical industry, and SAP's planned chemicals and pharmaceuticals site, which has already signed up the likes of BASF, Bayer and Degussa-Hüls. Note that SAP's plans include some cross-industry links, which we will come back to.

Horizontal cross-industry marketplaces

…and horizontal cross-industry marketplaces

Cross-industry marketplaces provide a platform for horizontal procurement/sales transactions between participants from different sectors. Trade can range from office stationary and IT equipment to pure services. SAP is also active at this level, having signed a "mySAP.com" deal with Dell, Cisco and Grainger, effectively providing them with an additional web-based distribution channel.

A choice of earnings model

Marketplace providers can earn money in several ways. The most popular models are:

- **Membership fees**
- **Transaction-based pricing**
- **Volume-based pricing**
- **Marketing related services**

The membership fee model lacks refinement

While membership fees are the most obvious and straightforward method of collecting payment for marketplace services, such schemes are hard to link to frequency of use or the richness of the services provided.

Per transaction charges fail to capture service value

Transaction-based systems trigger a charge each time a business process is run (eg, tender, bid, purchase, sale), irrespective of the underlying value of the transaction.

Volume-based pricing is linked to service value

As volume-based pricing is based on a percentage of the underlying transaction value, this system can better capture the value of the service to the customer.

Networks can be used to sell other products and services

Finally, e-marketplace operators can leverage their networks to market and sell other/third-party products and services.

Recent project announcements

Plans for a number of B2B trading sites have been announced in recent months. At the same time, the valuations of quoted pure-play e-vendors have multiplied as the market begins to grasp the overall economic implications of these electronic commerce initiatives. Not surprisingly, the list of pending IPOs in this sector is also long.

Let’s take a look at some of the most important project announcements made over the past two months:

Commerce One and General Motors

Through an agreement signed on 2 November 1999, Commerce One and GM will create GM MarketSite, a "virtual marketplace" for a wide range of products, raw materials, parts and services. This will complement GM’s existing internet portal, GM SupplyPower, which links the assembler with 30,000 suppliers.

Overall, GM aims to facilitate three types of electronic business: on-line catalogues, bid-quote processes, and on-line auctions. Commerce One plans to establish a global trading web of business-to-business e-commerce portals, including existing partners such as British Telecom (UK) and NTT Communications (Japan).

Although no financial details of the GM deal have been disclosed, we believe there could be three basic revenue streams: a flat transaction fee, a small brokerage percentage on value, and fees on the provision of finance through GMAC.

Oracle and Ford

Also on 2 November 1999, Ford and Oracle announced the formation of a joint venture, AutoXchange. The plan is to have an integrated e-business supply chain system up and running for Ford sometime in the first quarter of 2000. According to Ford, it does some US$80bn worth of purchasing transactions annually with over 30,000 partner suppliers, and some US$300bn in its extended supply chain. Here again, benefits for participants should primarily come from cost savings through more efficient procurement and transaction processes.

Although a definitive agreement is still pending, Ford expects to eventually hold a majority stake in the operations. Ford and Oracle envisage a percentage-based fee structure on the underlying transaction values. Neither partner has ruled out an IPO of the venture at some point in the future.

Note that Oracle's internet procurement customers already include Boeing, Compaq, General Electric, Honeywell, and UPS.

SAP

In December 1999, SAP announced a number of projects for its mySAP.com marketplace services. These involve both individual enterprises and open industry communities.

Major deal with the German chemicals and pharma industries

One of the most significant deals is a project to create an e-marketplace for the chemicals and pharmaceuticals industries to handle trade in material repair and overhaul (MRO) supplies.

The initial (predominantly German) participants will include:

- **BASF AG, Bayer AG, Degussa-Hüls AG, Henkel KGaA and Wacker-Chemie GmbH on the buying side;**
- **KSB AG, Linde AG, Sartorius AG, Siemens AG and Heinz Wollschläger GmbH & Co. KG on the selling side.**

If all goes to plan, the marketplace should go live at the beginning of the second quarter of 2000.

Note that EDS is to provide technology and integration support, while KPMG is to contribute additional expertise in e-commerce selling and purchasing solutions, and support the design of business processes and security mechanisms.

B2B Blue Sky: US$5trn by 2003?

Market consensus of US$1trn worth of B2B transactions by 2002-03E…

Most recent market research puts the total value of goods and services transacted electronically between enterprises at more than US$1,000bn pa by 2002-03. On this basis, B2B represents a far move valuable market opportunity than pure retail-related B2C.

…could well prove to be highly conservative

In our view, the consensus could well turn out to be well on the conservative side. General Motors and Ford alone have stated that they expect the bulk of transactions in their extended supply chain constellation to migrate to electronic systems over the next two to three years. Using the companies' own estimates, such transactions generated revenues of US$800bn in 1999, ie, not far short of the 2002-03 consensus. On a standalone basis, combined GM and Ford generated 1999E supply-chain revenues of just over US$300bn.

Fortune 500: US$25trn supply-chain transactions by 2002-03E; if only 20% was transacted on-line, B2B would be worth US$5trn…

The Fortune 500 companies reported revenues net of tax of US$11trn in 1998. Applying a conservative supply-chain-to-net revenue ratio of 2:1, the extended supply chain value of the Fortune 500 community alone should amount to more than US$25trn by 2002-03E. If only 20% of these volumes were to be transacted electronically between corporations, the on-line B2B market potential would amount to US$5trn by 2003.

…implying US$50-100m worth of demand for hardware and software

If we then assume that just 1-2% of on-line B2B revenues are invested in technology and software, then this sector should generate US$50-100bn worth of demand for hardware and software licenses.

…and US$10-15bn in revenues for marketplace hosts

Depending on the pricing model adopted by the majority of e-marketplaces, we would expect a 0.2-0.3% levy on the underlying revenues to prove sustainable. This would imply global annual e-marketplace revenues of US$10-15bn by 2002-03.

Bear in mind that this scenario is based on the Fortune 500 companies alone, and assumes that 80% of their B2B transactions (in volume terms) will still be conducted offline in 2002-03.

Few European companies are positioned to meet e-marketplace demand

In Europe, the number of pure-play application vendors in the electronic B2B segment is still limited. The majority of listed companies provide security and other related infrastructure technology, rather than complete end-to-end solutions. The only company that appears to have covered all the e-marketplace bases so far is Germany's SAP.

SAP: poised to exploit its backoffice prowess in the e-marketplace

As part of its mySAP.com product and internet strategy, SAP is gearing up to host a range of electronic marketplaces. These could take the form of customer-specific development, vertical industry communities, and horizontal cross-industry marketplaces.

- Through its mySAP.com division, SAP (Eur467) provides a marketplace server and delivers the technology which enables the transaction of business processes through the marketplace. In particular, this includes the business connectors and business document exchanges which ensure data communication between the parties involved.
- It also provides data mapping services, which enable participants to use their existing proprietary data structures (for objects such as customers, suppliers, raw materials, parts, finished goods, invoices, payment records, etc). SAP then takes care of mapping the transaction-related data to standardised XML records at the marketplace level.

We expect one of the key success factors in the B2B marketplace segment to be the ability to efficiently integrate web-based transaction systems with the backoffices of each of the participant companies.

Given that SAP already provides backoffice ERP systems to around 300 out of the Fortune 500 companies, its competitive starting point in this marketplace looks second to none. We are convinced that SAP is set to gain a significant foothold in the e-marketplace over the coming two to three years. Pure-play vendors, in contrast, face the challenge of delivering reliable back-end integration with third-party applications.

E-marketplace trends: from extranets to the WWW

From one-to-one deals to a marketplace open to all

The initial wave of electronic business-to-business commerce was dominated by extranets. Such systems automate off-line processes between partners, but are not the end game. The internet is now bringing in new entrants with the ability to create dynamic "many-to-many" environments capable of supplanting stagnant one-to-one extranet relationships.

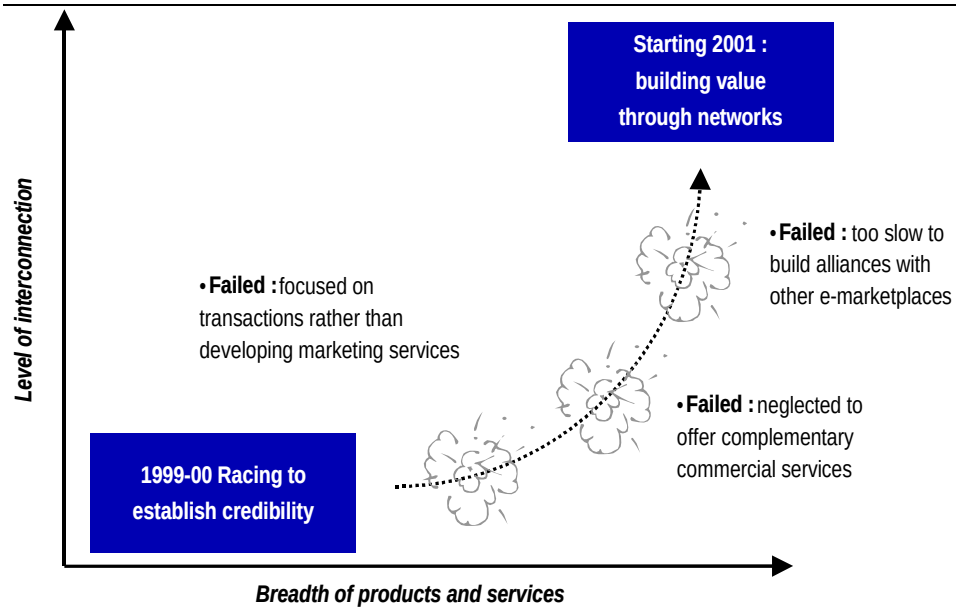
The gold rush is unlikely to last long and few are likely to strike it rich

However, while B2B trade looks bound to flow increasingly through e-marketplaces, not all the contenders appear to have what it takes to succeed. Over the next two yeas, we expect many of the burgeoning e-marketplaces to be forced to sell out or close down. Why? The market is already beginning to look crowded, unique opportunities are already scarce, and basic service offerings look likely to fail.

Competition is likely to result in both greater diversity and greater specialisation

As competition intensifies, we would expect successful e-marketplace players to diversify beyond simply collecting transaction fees, to expand through interconnections, and to configure their services for specific buyer segments.

The e-marketplace path



Source: WDR - Forrester

Most of today's e-marketplaces have been up and running for less than eight months. Over the next 12 months, we expect players to continue to focus on providing solutions that address narrow industry inefficiencies. However, from 2001, e-marketplaces should move beyond the pursuit of basic critical mass, and begin to seek more intense integration with other product and service providers.

Appendix

Pure Internet players on the European market (by market capitalisation)

Company	RIC	Market Cap (EURm) at close 4 January 2000	Country	Subsector
TerraNetwork	TRR.MC	15,890	Spain	Internet service provider
Broadvision	BVSN.F	13,060	Germany	eCommerce software
Freeserve	FRE.L	8,364	UK	Internet service provider
Tiscali	TIS.MI	6,143	Italy	Internet service provider
Intershop Comm	ISHG.DE	4,407	Germany	eCommerce software
Euraxfin (Consors France)	AXFI.PA	3,345	France	Online brokerage
Consors Disc Brk	CSOG.F	3,345	Germany	Online brokerage
Baltimore Tech	BLM.L	2,847	UK	Internet security vendor
Geo Interactive	GIM.L	2,703	UK	Multimedia software
QXL	QXL.L	2,519	UK	Online auctions
Business Objects	BOBJ.PA	2,512	France	Web-enabled databases
Framtidsfabriken	FTID.ST	2,261	Sweden	Internet consultant
Pixelpark	PXLG.DE	2,232	Germany	Internet consultant
Autonomy Corp	AUTN.DE	2,067	UK	Search engine software
Fantastic Corp	FANG.DE	1,947	Germany	eCommerce software
Freenet	FRNG.DE	1,838	Germany	Internet service provider
Brokat Infosys	BRJG.F	1,683	Germany	eCommerce software
Icon Medialab	ICON.ST	1,207	Sweden	Internet consultant
Scoot.Com	SCO.LN	1,137	UK	Portal / Content aggregator
The eXchange	EXC.L	1,136	UK	Market makers in vertical industrie
DAB	DRNG.DE	1,060	Germany	Online brokerage
Ce Consumer Elec	CEWG.DE	972	Germany	Market makers in vertical industrie
Ricardo.de	RIDG.DE	855	Germany	On-line auctions
Integra	INTA.LN	845	France	Web hosting & support services
Infomatec O.N.	IFOG.DE	785	Germany	eCommerce software
Fi System	FISY.LN	742	France	Internet consultant
GFT Technologies	GFTG.DE	660	Germany	Internet consultant
Teles	TLIG.DE	638	Germany	Networking equipment
Easynet Group	ESY.L	638	UK	Internet service provider
I-D Media	IDLG.F	574	Germany	Internet consultant
Affinity Internet	AIH.L	537	UK	Internet service provider
Tj Tieto	TJT1V.HE	492	Finland	Internet consultant
Tomorrow	TOQG.DE	485	Germany	Portal / Content aggregator
Uproar Ltd	EPUB.ES	478	Spain	On-line entertainment
1&1	EIEG.DE	469	Germany	Internet ad brokers
SinnerSchrader	SZZG.DE	456	Germany	Internet consultant
JSB Software Technologies	JSB.L	423	UK	Web development software
Valtech	VALT.LN	414	France	Internet consultant
Kabel New Media	KNWG.F	407	Germany	Internet consultant
Jet Multimedia	JTLG.PA	388	France	Internet service provider
Sports Internet	SRT.L	378	UK	Portal / Content aggregator
Effnet Group	EFFNHQFK.ST	358	Sweden	Internet security vendor
ebookers	EBKR.O	295	Germany	Online travel agent
Gameplay.Com	GAM.L	291	UK	On-line entertainment
Trintech	TTPAy.DE	281	Germany	eCommerce software
Boss Media B	BOSS.ST	274	Sweden	On-line entertainment
Infosource	INFO.BE	264	France	Internet service provider
InternetMediaHouse.com	IHUG.DE	258	Germany	Internet consultant
Articon Inf Sys	AAGG.F	252	Germany	Internet security vendor
Fortunecity	FCTY.F	251	Germany	Portal / Content aggregator

Company	RIC	Market Cap (EURm) at close 4 January 2000	Country	Subsector
Internet Technology Group	ITH.L	245	UK	Internet service provider
OneView.Net	OVN.L	238	UK	Internet service provider
I:FAO	FAOG.F	235	Germany	eCommerce software
WWL Internet	WWIG.DE	231	Germany	Internet consultant
Gigabell	GGBG.DE	222	Germany	Internet service provider
Dialog Corp Plc	DLG.L	221	UK	Web development software
fluxx.com	FXXG.DE	216	Germany	Internet consultant
Virtualinternet.net	VET.L	212	UK	Web hosting & support services
Buecher.de	BEHG.F	195	Germany	On-line e-tailer
Cybernet Intern	ZNET.F	191	Germany	Internet service provider
Net.IPO Ag	IPOG.F	174	Germany	Investment Services for IPO's
Freecom.net	FEE.L	172	UK	Web hosting & support services
Endemann Intrnet	ENMG.F	165	Germany	Portal / Content aggregator
Intelligent Env. Group	IEN.L	164	UK	Web development software
Linne Group (Cell Networks)	LINN.ST	163	Sweden	Internet consultant
Netbenefit Plc	NBT.L	154	UK	Web hosting & support services
Adera B	ADERb.ST	148	Sweden	Internet consultant
Access Commerce	ACSS.LN	142	France	eCommerce software
Netlife	NTFG.F	97	Germany	Internet security vendor
Bourse Direct	BDRP.LN	96	France	Online brokerage
Netcall Plc	NET.L	96	UK	Internet consultant
Nocom	NOCMb.ST	77	Sweden	Internet consultant
Buch.de	BUEG.DE	66	Germany	On-line e-tailer
Datadesign Ag	DTDG.F	48	Germany	eCommerce software
Artnet.com	AYDG.F	40	Germany	On-line auctions
Nedecon	NED1V.HE	28	Finland	Internet consultant
Voss Net Plc	VOS.L	12	UK	eCommerce software
Infinicom B	INFIb.FIFK	11	Sweden	eCommerce software
Artprice.com	Launch in Q1'00	N/A	France	Online auctions
GlobalNet Financial.com	GLF.L	N/A	UK	Online brokerage

Market capitalisation taken at close 4 January 2000

Warburg Dillon Read

This report was produced by:

Warburg Dillon Read (France) SA

Street address:
65 rue de Courcelles
F-75008 Paris
+33-1-48 88 30 30

Warburg Dillon Read
Head office
1 Finsbury Avenue
London
EC2M 2PP
+44-20-7567 8000

Warburg Dillon Read,1 Finsbury Avenue, London, EC2M 2PP Phone:+44-171-567 8000