

10 years on ●●●

The State of the Internet a Decade After Mosaic

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	Network of Networks	p 04
	They Said ... What happened	p 06
01	Economy	p 12
02	Globalisation	p 14
03	People	p 16
04	Information	p 18
05	Society	p 20
06	Marketing	p 22
07	Usability	p 24
08	Freedom	p 26
09	Content	p 28
10	Profit	p 30
	Revolution or Evolution?	p 32

"In the pages that follow, you will find no predictions about the future, since I think we barely understand the present."

– Manuel Castells, *Professor of Sociology and Planning, Berkeley University*

Network of Networks

This report began as an exercise in nostalgia. Reflecting on a decade in what can loosely be described as the Internet industry, prompted by the 10th anniversary of the first graphical Web browser Mosaic, I wondered how much had really happened to the world since a 21 year old NCSA¹ student posted a bit of code on the net on January 23, 1993 with the words: "By the power vested in me by nobody in particular . . . X Mosaic is hereby released. Cheers, Marc."

Even for the biggest technology boosters, the Web probably wasn't, as *Wired Magazine* once claimed, bigger than the invention of fire. But it's blindingly obvious that, despite the stock market crash in 2000 and associated media criticism, the Internet didn't fail either. What's less clear is where it sits exactly between these two extremes.

For one thing, it's important not to confuse temporary share valuations with the underlying significance of new technologies. From railways to electricity, such innovations have always been over-hyped, creating massive disillusionment and an inevitable backlash when they don't deliver on everybody's wildest promises. Their true, longer range potential then tends to be vastly underestimated. The fact that another unrealistically inflated stockmarket bubble burst, doesn't mean that the Internet won't still change everything. The questions are: how, when and why?

Perhaps the parallel with the extraordinary railway mania that swept through Europe in the 1800s is most direct. Here was a supposed technological revolution that promised similar things, like abolishing time and distance. As far as shareholders were concerned, railways were sold as a goldmine investment that would bring in millions. And naturally the vast majority of people lost their shirts.

But the railways are also a great example of something that did prove to be genuinely revolutionary and qualitatively transformed the entire economy. In the course of building these new systems there were several manias in which people lost fortunes, but the infrastructure for high-speed transportation remained (you wouldn't think so looking at the current British rail system, but that's another story).

As the accompanying chart shows, the global network has been flourishing before, during and after the crash, and has embraced a mainstream business and consumer audience. Perhaps a deeper economic indicator, given that the operations of all modern businesses depend upon application software programs, is the degree to which the net has infiltrated the \$76 billion² global software industry. In 1993 just 0.5 percent of such software was Web-enabled; today that figure is 99 percent³.

In fact, to really understand the impact of the Internet we need to dig much deeper than surface layer interactions such as e-mail and eBay and submitting expense reports via a company intranet (how most people would probably characterize the online world). These are just the visible tip of a much larger, submerged mass of technologies that lie hidden below the waterline of the Web.

We should think of the modern Internet as what's called a general purpose technology—something like electricity which affects the entire economy. It is the nexus of a century's worth of convergent innovations in computing and communications: microprocessors, software and information processing systems, compression, storage and digitisation technologies, and voice and data telecommunications networks.

By this wider definition, the Internet is a toolset of related, networked technologies operating behind the scenes in most daily interactions in the industrialised world — the estimated 4.8 million cash machine (ATM) transactions every hour⁴, for instance; or, for that matter, the \$1.5 trillion traded on the global currency markets each day⁵; the computerised networks behind public transportation and traffic control in most major cities; the inventory management retail systems in every high street; the Web of CCTV cameras that capture an image of the average British city dweller up to 2000 times a week⁶, even the touch-screen trivia machines in British pubs, connected by broadband lines to enable remote diagnostics, financial reporting, and automatically refreshed gaming content⁷.

Yes, some of these technologies had already existed for almost a quarter of a century, but it was Web-based computing in the 1990s that massively accelerated their adoption. And while every system isn't necessarily connected using Internet Protocol, they are all part of some kind of computer network which is, ultimately, a tributary flowing into the "network of networks," the Internet.

And where does the World Wide Web and, more specifically, Mosaic fit into all this? Consider that although the Internet was around over 30 years before the Web⁸, just 313,000 computers were linked to the net in 1990, whereas today there are well over 170 million⁹. Mosaic's point-and-click graphical Web democratised the Internet and unlocked its potential for a mass global audience.

And whether, as this collection of essays sets out to explore, events over the last ten years tell us if the Internet will prove to be truly revolutionary, or a more gradual, evolutionary development, the release of Marc Andreessen's small piece of code should be seen as a great milestone in the history of technology, society and the global economy.

Network of Networks

10 Years On

In 1993, the fax machine was a critical tool for business communications, e-mail was a toy for silicon valley executives, and the quickest way to see a picture of your Australian relative's new baby was to wait around a week for an airmail letter or fork out for an international courier.

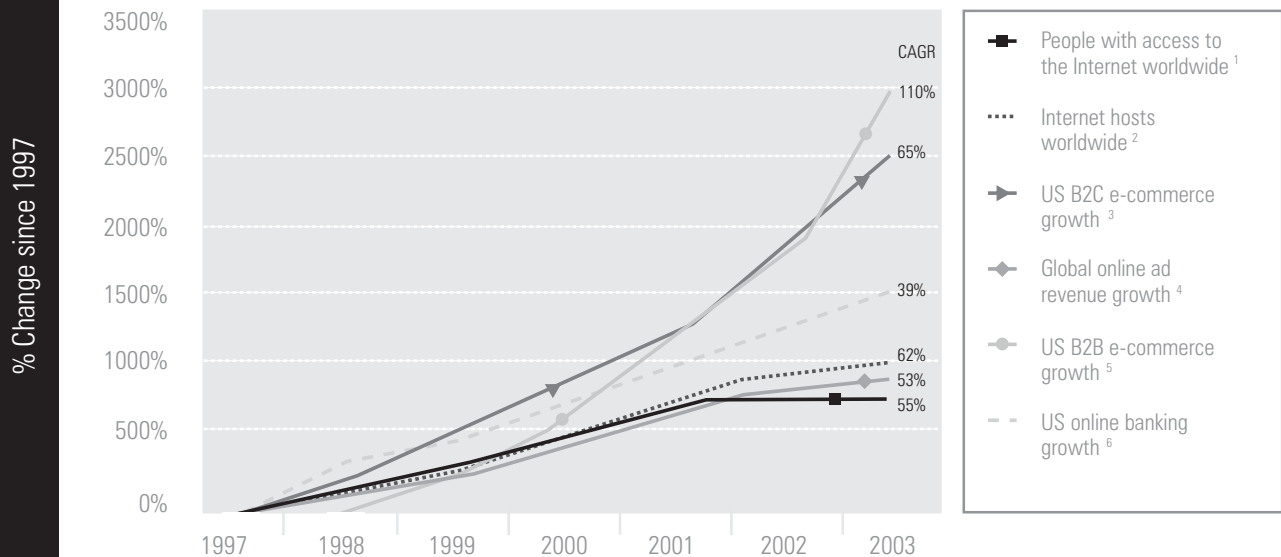
Today, 50 percent fewer faxes are being sent¹⁰ and over 655 million people in 224 countries¹¹ are sending 1.3 billion e-mails every hour¹². Many professions from media and academia to international finance — in fact, almost any industry that involves servicing customers at a distance — would now be unthinkable without access to e-mail and the Web (80 percent of U.S. business people recently voted e-mail more essential than the telephone for business communications¹³ and 51 percent of global executives said the Web was their most important business information resource¹⁴). And, of course, the transmission of any digitised information, photographs or otherwise, anywhere in the world is virtually instantaneous.

The Internet is now the primary communication tool for U.S. teenagers¹⁵ and almost a third of Europeans admit to e-shopping in their pyjamas¹⁶. 181 million online Americans¹⁷ are as likely to consult the Web for health information as a medical professional, and the net is their first port of call to find information on anything from government agencies to news and shopping¹⁸.

“... 10 years ago, anyone claiming that ordinary people would flock to expensive computers to take time from watching TV in order to create 3 billion or more Web pages ... would have been laughed out of the room as idealistic, utopian.”

—Kevin Kelly, co-founder and Editor-At-Large, *Wired Magazine*

Growth of the Internet Before, During and After the 2000 Dot-Com Crash



Sources: 1. CyberAtlas, 2003; 2. iSociety, 2003; 3. Gartner G2, 2003; 4. Jupiter Research, 2002; 5. Forrester Research, 2003; 6. NUA Internet Surveys, 2002.

The story of the Web has been largely characterised by fantastic predictions and promises that nothing would ever be quite the same again (billions of this, trillions of that ... just add zeros). But as this collection of ten statements shows, while some forecasts turned out to be wildly optimistic or just plain wrong, others were remarkably prescient and even underestimated the speed and depth of the Net's impact.

01

They said:

"The Net will have a billion users by the turn of the century." —*Nicholas Negroponte, founding chairman of the Massachusetts Institute of Technology Media Laboratory, 1994*

What happened:

According to the man himself, people either laughed in his face or rolled their eyes at what seemed like vintage Negroponte hyperbole when he suggested this nine years ago. Well, he was wrong, but given the audaciousness of his prediction, he didn't do too badly: the U.N. calculated that 655 million people were online globally at the end of 2002.

Although, that still leaves 5.5 billion who are not¹. In spite of Electronic Frontier Foundation co-founder John Perry Barlow's vision of "a world that all may enter without privilege or prejudice accorded by race, economic power, military force, or station of birth," 88 percent of Internet users are in industrialised countries, and half the world's population has yet to make a phone call or use electricity². For many developing countries, healthcare and clean water are more immediate priorities than Internet Service Providers.

However, some argue that developing economically without the Internet would be like trying to industrialise without electricity. Cut off from the global networks, there's much less opportunity for developing nations to generate the critical resources necessary to meet their development needs³.

02

"It's not even a question of years, but of months. Interactive will be a prevalent form of advertising by the beginning of 1995." —*Marc Andreessen, co-inventor of Mosaic Web browser, 1994*

Online advertising revenue in 1995 was just \$0.1 billion⁴. Today, online advertising spending is worth \$6.2 billion⁵, representing 2.3 percent of the global total.

Global online marketing expenditure is estimated to have grown by 19.1 percent from 2001 to 2003, compared with 7.4 percent for direct mail and only 1.6 percent for media advertising⁶.

Traditional advertisers' share of impressions went from 15 to 30 percent between 2000 and 2002⁷. In fact, half of the top 20 online advertisers in 2002 were Fortune 500 companies — compared with only two in 2000⁸.

03

They said:

“Technology today is the campfire around which we tell our stories.” –Laurie Anderson, performance artist and musician, 1994

What happened:

The online world can be divided into two camps: those who think blogs (contraction of “Web Log” – an online diary) are revolutionising journalism, promoting freedom of self-expression and giving the Internet much needed colour and personality, and those who see people with too much free time on their hands cluttering up the Web with their Freudian and Warholian journal-keeping — neurotic and narcissistic self-analysis confessing itself to the world in the hope of getting those 15 minutes of celebrity.

The truth, as usual, is somewhere in between. Mass amateur publishing is an interesting phenomenon, though hardly a new technology (software tools like Blogger – “Push-button publishing for the people” – just made it more convenient). Extraordinarily mundane and intimate Web pages of interest only to someone’s immediate family (50 percent of U.S. bloggers are teenagers writing for exactly this audience⁹) have been around as long as the Web. And there’s definitely a part of blogging which is a sign of our times: everyone feels the moral obligation to express themselves, no matter how trivial, uninteresting or irrelevant their thoughts might be.

When Walter Benjamin wrote his seminal essay, *“The Work of Art in the Age of Technological Reproducibility”* – arguing that the mass media has the potential to be democratizing because the public can take control of the means of production and turn from readers into authors – he may not have had 2 million¹⁰ world-wide bloggers in mind, but he recognised the trend of human behaviour.

04

“The Internet is now big enough that it qualifies as a mass market.” –Vinton Cerf, co-“founding father” of the Internet, 1995

If “mass market” is defined as a global audience of 50 million or more, then the Web reached this milestone in a little over three years, by the end of 1996, compared with 15 years for TV and 37 for radio. But if the measure is a household penetration of greater than 50 percent, then it has taken the net the same amount of time as TV (eight to nine years) to be in approximately 60 percent of U.S. homes¹¹ (although in the UK it’s still hovering around 50 percent¹²).

Given the current levelling off in household penetration in the U.S. and Europe¹³, the Internet seems to be following the same pattern of adoption as other new communications technologies: fast growth, plateau, and then steady climb to saturation.

On the other hand, Net access at work is rising rapidly (in the U.S. the number increased by almost a quarter in the last year¹⁴ and U.K. users now spend more time online at work than they spend watching TV¹⁵) and developments like broadband, 3G mobile connectivity and short-range wireless (WiFi) networking will all increase the number of people online¹⁶.

So the Internet may yet reach full saturation far faster than TV, which took roughly 30 years in the U.S. to climb from 63 percent of households to the current 98 percent.

05

They said:

"I predict the Internet ... will soon go spectacularly supernova and in 1996 catastrophically collapse¹⁷."

—Robert Metcalfe, inventor of Ethernet networking and founder of 3Com, 1995

What happened:

As it turned out, the dot-com stock market mania created enough extra investment in the Internet's infrastructure to take the strain of its booming popularity. And, of course, it was the financial boom that ended up going "spectacularly supernova" and catastrophically collapsing.

The very first signs of this can be traced back to an article that appeared in the March 20, 2000 issue of Barrons. Titled: "Burning Up. Warning: Internet companies are running out of cash - fast," the piece questioned the very high cash burn rates of publicly-traded Internet companies. The market began an accelerating retrenchment thereafter.

The bubble finally burst on Friday April 14th, 2000 when \$1,000 billion was wiped from the value of America's leading companies. The Nasdaq index was hit hardest, seeing its value fall by 10 percent, wiping more than \$500 billion from the value of Technology companies¹⁸. Over the next week, Nasdaq fell by a further 25 percent. By the end of April, the exchange had lost \$2,250 billion. Since March, 2000, an estimated \$5 trillion in stock market wealth has vanished¹⁹. (Although, to put this in some kind of perspective, this amount is traded every 80 hours in global electronic currency transactions²⁰; the value of Internet stocks may have crashed but "Cyberspace" is still literally, as Benjamin Woolley defined in his 1999 essay, "where the money is").

06

"Governments of the Industrial World, you weary giants of flesh and steel, I come from Cyberspace, the new home of Mind. On behalf of the future, I ask you of the past to leave us alone. You are not welcome among us. You have no sovereignty where we gather."

—John Perry Barlow, Grateful Dead lyricist, cattle rancher and cyber-rights pioneer, "Declaration of the Independence of Cyberspace," 1996

As might be expected, governments around the world were much keener on extending rather than relinquishing their control and authority in cyberspace. For example, the British parliament introduced the Regulation of Investigatory Powers Act (RIPA) in 2000 to give state agencies the right to access the names and addresses of Internet and telephone subscribers, and details of the calls they make, the sites they visit, and the emails they send and receive.

And according to Amnesty International, China – the 3rd largest and fastest growing online nation in the world²¹ – has introduced more than 60 rules and regulations covering the use of the Internet since 1995 and 30,000 state security personnel are monitoring Web sites, chat rooms and private e-mail messages.

07

They said:

“This idea that somehow or other Microsoft says, ‘Thank you, boys, for thinking this up. Now we’ll come take it over,’ is way premature.” —*Jim Barksdale, CEO of Netscape Communications, 1996*

What happened:

In September 1996, 83 percent of Internet users used Netscape as their primary Web browser, compared to just eight percent for Microsoft’s Internet Explorer²². Just one year later, Netscape was still the market leader but its market share had fallen to 50.5 percent, while Microsoft accounted for 22.8 percent of browsers. AOL’s proprietary browser came in third with 16 percent²³. By September 2002, Microsoft completely dominated the Web browser market, with 95.3 percent of market share. Netscape’s share of the market fell from 18 percent in 2001 to just three percent a year later²⁴.

Netscape famously missed the opportunity to fight off Microsoft’s dominance by releasing its ‘Navigator’ browser source-code freely over the Web too late. It was an attempt to copy the tremendous success of the Linux ‘open-source’ operating system, which is collaboratively created and maintained by thousands of online software programmers all over the world.

Today, Linux can be found in nearly four out of ten large U.S. corporations²⁵ (a 13.7 percent total share of a \$50.9 billion market²⁶) and 72 percent of corporations with revenues of more than \$1 billion are planning to increase their usage of it over the next two years (about one third of those will be replacing Microsoft Windows)²⁷.

This year, however, the trailblazing Netscape browser is finally being laid to rest once and for all. Owner AOL has laid off most of the development team and will support existing software but won’t release new versions.

08

“Marketing on the Web is going to be a lot more humane than marketing in traditional mass media because it’s possible to treat people individually.” —*Tim Berners-Lee, Inventor of the World Wide Web, 1997*

While more and more sites are using personalisation software to provide an individual user experience, indiscriminate, bulk ‘spam’ marketing now accounts for between 40-50 percent²⁸ of total e-mail traffic. And it’s on the rise: e-mail security firm MessageLabs found that spam accounted for as much as 55 percent of the 134 million sample e-mails it scanned in May.

The Economist estimates that the 350 billion²⁹ offers of free debt consolidation (17 percent of unsolicited e-mails are financial³⁰) and herbal formulas for genital enlargement (20 percent are porn) this year in the U.S. alone will cost businesses more than \$10 billion in lost productivity and extra investment in anti-spam measures³¹. Palo Alto-based research firm the Radicati Group, thinks the global volume is much higher and estimates that worldwide corporations are receiving 26.8 billion spam messages each day in 2003³².

Although, interestingly, the latest academic research by The Pew Internet & American Life Project paints a different picture. 71 percent of their U.S. respondents said that only a little of the work e-mail they receive is junk. The survey concluded that mass-market personal e-mail providers (AOL, Yahoo, MSN, Hotmail) are much easier spam targets than businesses: “It’s like shooting fish in a barrel instead of a lake.”

09

They said:

“There isn’t an Internet company in the world that’s going to fail because of mistakes — Internet companies make thousands of mistakes every week.” —*Candice Carpenter, former CEO and co-founder of iVillage, 1998*

10

“U.S. e-commerce trade between businesses (b-to-b) will be worth \$1.3 trillion, and consumer e-commerce (b-to-c) will reach \$108 billion by 2003.” —*Forrester Research, 1999*

What happened:

In January 2000, it is estimated that between 7,000 and 10,000 Net-related companies received formal funding from venture capitalists. In the following three years, 4,854 of those companies closed or were acquired. Companies spent \$200 billion acquiring troubled Web properties between March 2000 and March 2003. In the same period, 962 substantial net companies declared bankruptcy³³.

More recently, Business Week reported that 40 percent of the 208 publicly-held Internet companies that survived the shakeout had become profitable by the fourth quarter of last year and this should reach 50 percent by the end of 2003.

According to Forrester’s most recent predictions, “U.S. b-to-b e-commerce will almost double their earlier estimates and hit \$2.4 trillion³⁴, while b-to-c will come close and be worth \$95 billion by the end of 2003³⁵.”

"[The Internet] is not displacing 'the old economy' but instead manifesting its potential for 'renewal'."

– Paul A. David, Professor of Economics and Economic History, Oxford

01 Economy

Now that the dot-com sound and fury has abated and the famous "irrational exuberance" has been deflated, two fundamental questions remain. Are we operating in a 'new' kind of economy that produces and distributes value in different ways? Or are we back to business as usual, albeit boosted by new technology innovations (the equivalent of replacing the fax machine, for example) and new channels to market (like, say, mail order catalogues)?

For one thing, 'old' and 'new' were always figures of speech. There were never two separate economies in competition — as the media portrayed it¹ — so much as a constant interaction and mutual dependency between established and emerging technologies. And this applies to any economy at any given stage in history.

What's unarguably 'new' about today's economy are the trillions of terabytes of information flowing through ubiquitous computer networks, and the ability to turn this information into profit. This can be traced back to the dawn of the 'Information Age': the computer boom years in the late 70's and early 80's when the likes of Toyota and Benetton revolutionised 'just-in-time' production and distribution with decentralised, network-based operations.

The financial value placed on intellectual capital created by so-called 'knowledge workers' exploded. Between 1980 and the mid-1990's the salary rewards for a university degree in America doubled, with post-graduates earning 90 percent more than the high school educated workforce².

And naturally employment opportunities in information and communications industries themselves skyrocketed: jobs in IT increased almost 600 percent from 1980 to the end of the 1990s³. Another powerful illustration of this growing income inequality as the value of information capital rose is the fact that average real wages in Silicon Valley actually fell during the 1990's, even though the earnings of technology industry workers (the top third of the population) went through the roof with approximately 65 new 'paper millionaires' created every day in 1999⁴.

Businesses are, to some extent, becoming more invisible as bandwidth, chips and bits replace megatons of railway steel and motorway concrete; future growth won't have to be restricted by the same kind of immense capital spending and heavy-duty industrial infrastructure and hardware.

But the old/new debate was never a question of less physical things being made. Despite talk of a "post-industrial society," more manufactured real-life goods, from cars to food, are being produced than ever before. Modern technology means that it is simply taking far fewer people to make them.

And these people can be working in different locations all over the globe. Once it took 80 percent of the population to produce the UK's food⁵, now this can be done with just two to three percent of people, plus imports from other parts of the world⁶. This is far smaller in relative terms, even though the output has increased.

In this sense, the definition of a new economy is one which produces the same sorts of things as an old economy, but in radically different ways and at vastly different speeds. New technology suddenly opens up previously unimagined new horizons, but it doesn't necessarily alter the underlying drivers of the economy. Human wants, luxuries, tastes and necessities don't change; how these needs are supplied, in what quantities, where and how rapidly, does.

For example, just because people never dreamed of radio, movies and TV 200 years ago, doesn't mean that there wasn't a media industry. From actors to fairground folk to newspapers, people still wanted to be entertained and informed, but on a relatively much smaller scale. Modern media with a 24-hour global public has massively altered the scale and composition of that industry, but the fundamental market demands being met have remained largely the same.

During the bubble, there was a tendency to assume that new tricks would transform the economy. But the dot-coms that have worked — from bookselling, betting and dating services to sales force management tools — filled the need of the existing economy and took advantage of the Internet to radically improve how customer needs were filled. For instance, the idea of haggling at flea markets has been around since, well fleas presumably, but e-Bay brilliantly harnessed the efficiencies of a global network to breathe new life into the old idea.

Notable economist Paul David (of Oxford and Stanford Universities) supports this view. He believes that the Internet has transformed the economy by combining with and re-energising the "productivity and profitability of other pre-existing technologies and organisational modes." Again, in an economy increasingly based on the value of knowledge, one of the ways David believes the net qualitatively affects material progress is by connecting together more powerfully the many databases all over the globe packed with digital information goods⁷.

To lay the argument to rest once and for all, perhaps we can agree that today the economy in which we live is neither old nor new but digitally 'renewed.'

Plain Sailing

“The ‘new economy’ appears less like a new economy than like an old economy that has access to a new technology.” –Harvard Business School guru, Professor Michael Porter

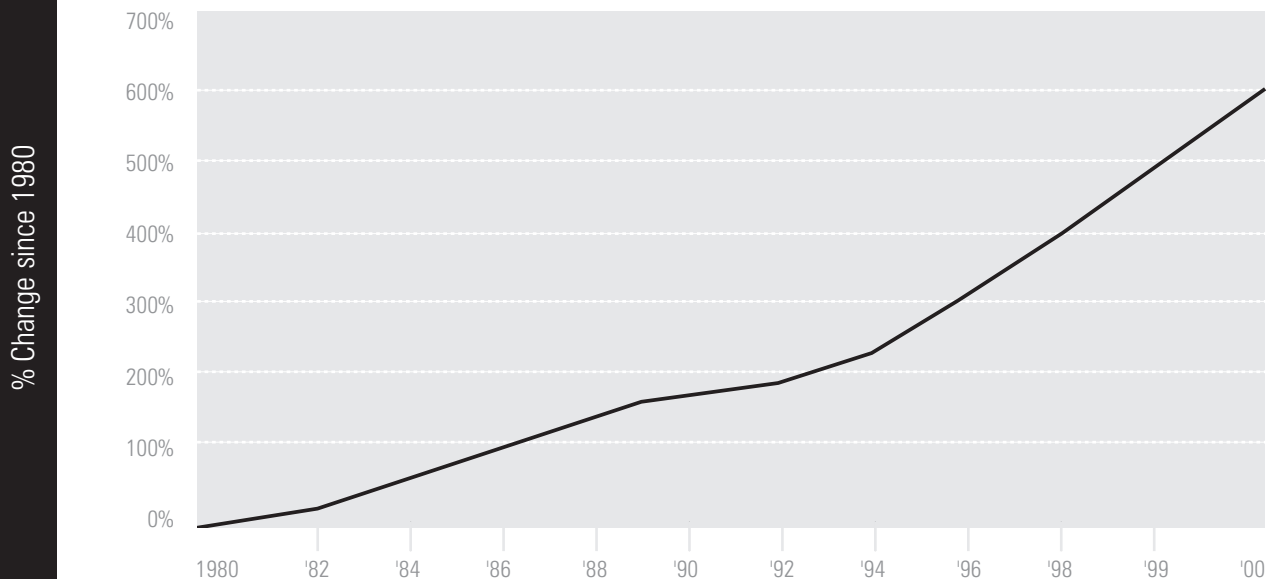
Of course, today’s new-technology-powered economy makes it possible to do some radically new things (medical and scientific breakthroughs such as IVF or space travel, for example), but it also makes it possible to do countless old things much more efficiently. Take, for instance, the number one manifestation of superfluous consumption for any self-respecting high-tech billionaire: the luxury yacht (total sales of 100ft plus ‘pleasure crafts’ did in fact more than double in the tech boom years between 1988 and 1998)⁹.

Sailing is essentially the same activity as it was 100 years ago, even though modern technology has transformed virtually every part of the design and production process and every piece of material used to make and operate these boats (in

ways not conceived of even 50 years earlier). Yet Joshua Slocum, the late 19th century seaman, and the first man in recorded history to sail around the world single-handedly, would recognise most essential parts of the yacht “Kingfisher” that Ellen MacCarthur used to do the same thing in February, 2001.

Although he would undoubtedly marvel at advances like electronic navigation and the satellite communications systems that kept the craft in pretty much constant contact with the rest of the planet, he’d feel reasonably familiar with the way the boat itself looked and worked (in marked contrast, say, to a traumatised and helpless Wright brother were he to find himself in the cockpit of a 747).

U.S. labour Market Growth in Computer and Data Processing Services (SIC: 737)



Includes: Computer Integrated Systems Design; Computer Maintenance and Repair; Computer Programming Services; Data Processing and Preparation; Information Retrieval; Pre-packaged Software. Source: US Department of Labor, Bureau of Labor Statistics, 2003.

"The new electronic interdependence recreates the world in the image of a global village."

– Marshall McLuhan, *celebrated media and cultural theorist*

02 Globalisation

The Net's heritage as a world-wide, electronic communications system can be traced back to the first instance of modern globalisation in 1871 when news of the Derby winner was telegraphed from London to Calcutta in under five minutes. New technology has always been central to the process of globalisation: namely, abolishing the constraints of time and distance and allowing us to regard the world as a single unit of economic activity. In this sense, globalisation is definitely a work in progress — it's a safe bet that time and space will continue to shrink throughout this century (although future communications advances are likely to be in carrying capacity rather than speed, which — unlike sub-sonic mass transportation — has virtually ceased to be a constraint).

130 years after Jules Verne first defined the globalising times with *Around The World In 80 Days*, we rely on the communication and transportation innovations — from the electric telegraph and information processing systems to steamships, railroads and air travel — which, in effect, made globalisation possible (or at least without them, it would operate on a timescale of years rather than hours and seconds).

The explosive growth of the world's economy in the last century (global gross product nearly quadrupled in the 19th century, but multiplied by a factor of 12.5 during the last 100 years¹) has been driven by these modern technologies which created international trade on a mass, modern scale. For instance, there simply aren't any big businesses today whose operations don't depend on essential, global activities, like international fund transfers.

Ironically, globalising technologies like e-mail and cell phones (or at least cheap long-distance calls) have also proved powerful tools for forging international networks and synchronising world-wide mobilisations against globalisation. "Our Resistance is as Trans-national as Capital," proclaimed the organisers of the Carnival Against Capitalism demonstrations which took place simultaneously in 43 countries on June 18th, 1999.

But while many activists agree that it's pointless to resist the historical tide of globalisation, it's clear that we all need to do something about the enormous social problems this process of economic and technological development creates — for instance, an inequality in the global concentration of intellectual as well as financial capital.

Since electronic systems first enabled the large-scale flow of virtual currency around the globe, the relationship between wealth and the actual output of goods and services has long since lost all meaning. But paradoxically, in spite of the net's promise to re-create the library

of Alexandria and freely distribute its riches across the globe, knowledge also left the 20th century as concentrated as wealth.

Virtual networks and communities can add to the enormous accumulation of online information, but to make real use of it you still need a cutting-edge environment with a critical mass of facilities, infrastructure and talent. Anyone not living close to the world's major research centres (Californian and Massachusetts Bay Areas, or Cambridge in the U.K.) will be increasingly disadvantaged. This growing gap between the size and richness of what world-renowned sociologist Manuel Castells describes as nodes of power on the modern information networks, is why Google or Mosaic was always more likely to have been written in Berkeley than Bangalore. Intellectual capital, especially technological, will continue to reside in a small number of countries. Sadly, we'll be a long way into the 21st century before it pays to move from San Jose to Delhi to make it in the computer business².

The Internet has also magnified an inherent contradiction in globalisation. It's clearly much more efficient for trans-national businesses to operate as if the world was a single, uniform, easily accessible market. But it's equally apparent (thank goodness) that the complex and varied world refuses to act like a homogenous trading block. There's an obvious requirement to operate quite differently in diverse environments and since corporations need to speak to their markets in local languages, there will always be commercial pressure to localise communications to fit particular cultures. In fact, this is particularly important on the Web where studies have proved that customers are much more likely to purchase on a localised site and service costs fall dramatically when instructions are displayed in the user's native language³.

So the Web is also helping to promote and celebrate cultural diversity by nurturing independent, local languages and cultures and encouraging much smaller communities to thrive within a new, global economy.

And unlike Hollywood — probably the single, biggest influence in spreading generalised cultural habits and values across the globe — the Net reaches it's audiences as individuals and relatively small communities, rather than national or global audience blocks. You still need movies to make blue jeans a part of worldwide youth culture.

In fact, as the other big language blocks, like Hindi and Mandarin Chinese, gather momentum online (63.5 percent of current Internet users are not native English speakers and their number is growing rapidly⁴), the Internet could become highly fragmented as a global media — in some senses rebelling against the standardised approach of globalisation it is also helping to perpetuate.

Interconnectedness

“The infrastructure of our everyday life, from energy to transportation to water supply, has become so complex, so intertwined, that it’s vulnerability has increased exponentially.” –Manuel Castells, Professor of Sociology and Planning, Berkeley University

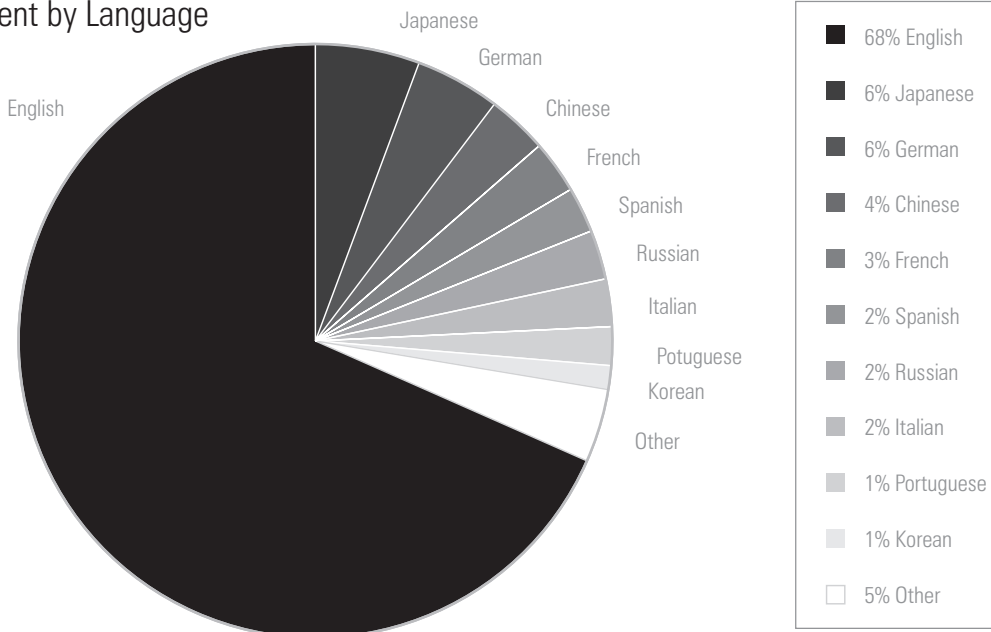
Modern infrastructure is fragile as well as vulnerable. The operation of today’s deeply interconnected global economy is based on the steady, unbroken flow of information, supplies, traffic and transport. It relies heavily on technology and, as a result, is very sensitive to slight disruptions at any point in the chain. Think of how a cancelled flight on a modern international trip impacts every other part of the journey: connecting flights, hotel bookings, business meetings and cars waiting at the airport.

Similarly, when the U.K. ground to a halt in the 2000 petrol strike, all aspects of the economy were affected. When the retail supply chains ran out of this non-renewable energy source,

all the just-in-time ordering technology on which the whole trade now depends (otherwise too much capital would be tied up in stockpiling inventory and raw materials) also failed. And for consumers, those fabulous, 18 hours-old, vine-ripened tomatoes, grown in December under huge third-world irrigation systems didn’t get air-freighted to anyone’s local, first world Sainsbury’s (or, of course, delivered to their door if they ordered online).

Web Content by Language

Percentages



Source: Global Reach, 2003.

"The conventional definition describing it as a global network of computer networks contains an elementary schoolboy mistake. It makes no mention of people. And it's the people who make it really interesting." — John Naughton, *academic and Internet journalist*

03 People

E-commerce in all forms is booming (U.S. consumers are now spending more than \$20 billion per quarter online¹ while the Web already accounts for nearly 6 percent of all U.K. retail sales²), but the Internet still remains a more natural medium for communication than commerce. Most people go online to talk, learn and explore, rather than buy.

Because of its direct simplicity, speed, convenience and reach, e-mail has always remained the most popular online activity³: straightforward, person-to-person interaction is still the main reason new users get connected and the first thing they do when they go online. Five billion instant messages⁴ are now exchanged every day by 320 million people⁵. And SMS usage in Europe has been increasing by 30 or more percent a year with over 11 billion text messages now sent every month⁶.

In many different studies of what consumers do online, communicating and seeking information always top the list by a wide margin. In the U.S. for example (which still accounts for around 30 percent of total Internet users — although this is changing fast), e-commerce doesn't even make it into the top ten list of activities that Americans have either ever done, or do daily, online⁸. Researching information about potential purchases far outstrips the actual transactions made online; in fact, a recent survey concluded that offline sales influenced by the Internet added up to 50 percent more than the value of goods and services sold directly over the Web⁹.

The most successful consumer e-commerce models have always understood that communication is the prime currency in trading online and actively encouraged customers to exchange information and services directly with each other. On eBay alone, approximately 30 million people will trade more than \$20 billion worth of goods between themselves this year (more than the gross domestic product of 122 of the world's countries)¹⁰. Another example is the fastest growing area of e-commerce: paid online content (the definition of which includes services — i.e. content as the co-ordination of assets and functionality); excluding porn, the sector's brightest rising stars are Personal/Dating (196 percent annual increase) and Greetings (438 percent increase)¹¹.

Business-to-business firms like SAP and Deutsche Bank are getting in on the act too, adopting successful techniques used by the likes of Amazon and eBay for years, such as the net's system of peer review where customers rate the quality of interactions, information or products¹². And a report looking at the effects of business-to-business e-commerce in developing nations concluded that significant trade can't be created where personal, trusted business relationships aren't already present, and that the main impact of the Internet had

been to strengthen connections between existing trading partners and reduce the cost of communications with e-mail¹³.

As John Naughton points out, the true creators of technology are never the geeks in their garages but always the end users who decide whether or not to adopt it. He quotes Ilkka Tuomi, Nokia's Principal Scientist, who observed that: "Innovation happens when social practice changes. If new technology is not used by anyone it may be a promising idea but, strictly speaking, it is not technology".

Quite. Which is why local black-markets and their taxless economies will always hamper the mainstream adoption of digital currency. Unless electronic cash systems are anonymous (which is unlikely as criminals would have a field day), the government could, theoretically, track everyone's personal financial transactions. Cash still accounts for nearly three out of every four personal payments in the U.K.¹⁴, including all those unofficial, direct transactions for services. After money is withdrawn from a cashpoint, it disappears from sight and that's how people like it.

In fact, successful digital technology trends in general — such as peer-to-peer file sharing applications which enable networked communities to organise themselves and exchange any kind of digital content (music, video, documents, software, etc) more easily¹⁵ — illustrate how technology is finally catching up with the way people naturally behave. Online, we're now sharing everything from camcorder holiday footage and family photo albums to poetry or love-songs while chatting with friends, partners and colleagues — just as we do face-to-face in the physical world¹⁶.

The Internet has always been about connecting people and helping them find information, entertainment and community. That's what made it exciting and interesting to begin with. In spite of what many businesses thought (and in some cases still think), the Web was never a new kind of television with infinite channels of centralised programming to passively watch, or a giant e-commerce warehouse millions of consumers were waiting to order from. It's always been something created by individuals¹⁷. Businesses should never forget how the net was used in the first place (e-mail, forums, using free Web space to post baby scans for friends and relatives). There's only ever been one magic ingredient for truly compelling Net interactions: people.

Brave New World

There's a lot of utopianism about technology today – and for good reason. For more than a century people in the west have lived longer, fuller and more varied lives largely because of the technology behind the economy. Our fear of science, which once threatened a global thermonuclear apocalypse, used to make us suspicious of all the technology it fathered. This started with Hiroshima and ended with the cold war. Now there's a sense of tremendous confidence in our high-tech future and how all our problems can be solved by computers.

On the other hand, technology has always been a great place to project current anxieties about the political and social agenda of the times. Martians, for instance, were a useful symbolic representation of our cold war anxieties in 60's science fiction. But the Internet today is as real as the cars people drive – it's no longer a metaphor but a social reality. The Web played a huge part in helping change mass perceptions of information technology and has become part of our lives in an amazingly short period of time.

"It's okay if computers land our planes safely, but we get all emotional when they beat us at chess." –*Professor Peter Cochrane, futurist and former BT Chief Technologist*

For the next decade our anxieties will continue to turn towards advances in bioengineering: genetically modified "frankenfoods" and unlocking the secrets of human life with the key of DNA. (In fact, our current fears of technology are expressed in biological metaphors: worms and viruses, artificial intelligence, etc). Mind you, in the age of genetic engineering at least we won't have to worry about teenage geeks trying to write computer viruses online — they'll be too busy hacking the family dog.

Top 10	Activities Americans have ever done online	% of those with Net access	Daily Internet activities	% of those with Net access
1.	Send e-mail	92%	Go online	49%
2.	Use a search engine to find information	88%	Send e-mail	31%
3.	Do an Internet search to answer a specific question	83%	Use a search engine to find information	26%
4.	Research a product or service before buying it	83%	Get news	23%
5.	Search for a map or driving directions	79%	Surf the Web for fun	19%
6.	Look for info on a hobby or interest	76%	Look for info on a hobby or interest	21%
7.	Check the weather	73%	Check the weather	20%
8.	Look for info about movies, books or other leisure activities	69%	Do an Internet search to answer a specific question	19%
9.	Get news	75%	Do any type of research for their job	20%
10.	Surf the Web for fun	67%	Research a product or service before buying it	19%

Source: Pew Internet and American Life Project, 2003.

“...a wealth of information creates a poverty of attention and a need to allocate that attention efficiently among the overabundance of information sources that might consume it.” — *Herbert Simon, Nobel laureate economist and behavioural scientist*

04 Information

The operation of multi-national corporations and entire economies now depend increasingly on the rapidity and free flow of the currency of modern business: digital information.

Financial market data is the most obvious example. This is also how Dell’s now legendary just-in-time ordering systems so efficiently match demand with supply that the company only needs to stock two hours worth of computer parts inventory at its plants at any one time¹.

As more and more physical business assets go online, for instance by tagging material goods with data-collecting wireless sensors so they can be measured and managed virtually, the sheer volume of this type of information will expand even faster.

Radio Frequency Identification (RFID) technology is already helping to track library books², sort passenger bags at airports, collect electronic tolls on American highways and automate manufacturing processes³. And now the world’s largest retailer Wal-Mart has directed its top 100 suppliers to embed these chips in shipments within two years to automate more sophisticated inventory tracking through the supply chain⁴. Most merchants will soon follow (many, such as Tesco already have trials running).

But there’s an ever-growing amount of information that simply isn’t necessary. For example, very few people actually need constant, 24-hour access to news. And a good proportion of the seven-plus million new Web pages⁵ or 31 billion e-mails created each day⁶ might be most kindly described as ‘non-essential’.

Keying in the word “information” on Google returns around 800 million search results in 0.13 seconds. For practical purposes, there’s been nothing like this in global history. But while this overwhelming amount of information — which can be located anywhere in the world — is now always available instantaneously online, acquiring the skills and confidence to harness it effectively is less straightforward.

It will be our education system that will have to help tomorrow’s workforce navigate through the flood of digital content — teaching the creative response, intuition and speculation required to turn information into knowledge and understanding⁷. Simply providing different ways to communicate and access this new world of information is not fundamentally different from letting someone look things up at a library; or worse, treating students as passive consumers of an existing body of knowledge — little pitchers waiting to be filled with, in the words of Dickens’ Gradgrind, “facts, facts, facts”.

However, there is also real value for the average consumer, citizen or worker from this superfluity of freely-available online information. For example, the post-war sellers market was summed up by economist J.K. Galbraith as: “A world in which people increasingly served the convenience of organisations which were meant to serve them.” To some extent the Web has helped shift power from producers back to consumers by handing customers more choice and control.

There’s no question that in many industries, such as health and finance, knowledge monopolies have been undermined by democratic access to legitimate information sources and professional databases previously only available to specialists.

Researching health information is now one of the most popular online activities (pursued by around 93 million Americans), or 80 percent of U.S. adult Internet users⁸). An orthopaedic surgeon complained to the New York Times recently: “I have people coming to the office who have downloaded 50 pages of stuff from the Internet on minimally invasive surgery⁹.”

But an unparalleled freedom of choice and access to so much information is becoming as much of a curse as a blessing. According to a UCLA report, skepticism in the credibility of content on the net is steadily increasing year on year. While the Internet is considered to be a more important source of information than books, television, radio, newspapers, or magazines by almost 75 percent of users, only half trust that this information is accurate and reliable¹⁰.

Consumers are now even more likely to depend on major brands when they simply haven’t got the time or energy to read all the small print and separate truth from half-truths or a fair deal from a rip off. In theory at least, if you trust the American Express brand, you won’t need to read the privacy policy on their Web site¹¹.

Trying to make sense of a world already overloaded with news, opinions and ideas is hard enough already. The Web’s random deluge of data and disinformation — anonymous rumours, gossip, hoaxes, hype and lies (including health and medical issues) — obscures the facts and distorts our trust in what’s worth believing. Free speech online has its price.

After Kennedy’s assassination, many believe the FBI covered its tracks by producing an 11,000 page report, literally drowning the truth in an ocean of indiscriminate information (and it’s never surfaced to this day¹²). If knowledge is power, then total freedom and the universal accessibility of all information could eventually dilute its meaning and value, leaving us powerless to know anything.

21st Century Alchemy

To prosper in an information-economy, businesses will have to master the three-step process of 21st century alchemy: changing base data into information, information into knowledge and finally knowledge into profit (gold or otherwise).

If data are symbols without inherent meaning (a set of observations made either by people or mechanical instruments), then information is data that has been made meaningful. For example, statistics of which supermarket products are in stock are data; a report tracking what's selling and what isn't is information. The first is a bunch of unrelated facts; the second describes the relationship between them.

Using this information to decide which products to discount or discontinue requires knowledge or know-how: knowing how a system works or how to make it work the way you want.

"An ounce of information is worth a pound of data. An ounce of knowledge is worth a pound of information." –Russell Ackoff, *systems theorist and Professor of Organisational Change*

'Knowledge workers' accounted for almost 30 percent of the net rise in employment in OECD countries during the 1990s¹³, and in the U.S. they now outnumber factory workers by two to one¹⁴. Between 1985 and 1998, not only was the percentage growth in wages for this knowledge-intensive work more than three times higher than for average U.S. employment, but the salaries of "goods-producing" jobs fell by nearly 2.5 percent during the same period¹³.

Information Overload

Number of static Web pages:	4 billion ¹
Total amount of Web information (incl. dynamic database content):	600 billion pages or 7.5 petabytes of information ¹
Daily production of online information:	7.3 million web pages per day ² , 5 billion instant messages and 31 billion e-mails ⁵
Number of books, magazines and newspapers published annually:	950,000 new books; 80,000 magazines; 25,276 newspapers ⁵
Amount of information in the average Sunday edition of the New York Times:	More than all the written material available to a western reader in the 15th century ³
Volume of global data that will be created between 2003-2005:	As much as the previous 40,000 years combined ⁴
World's annual production of information (print, film, magnetic, and optical storage media):	5 exabytes - equivalent to all the words ever spoken by human beings (growing at 30% per year between 1999 - 2002) ⁵

Sources: 1. Forrester Research, 2002; 2. Lyman & Varian, University of California at Berkley study, 2000; 3. "Attention Economy - Understanding the New Currency of Business", Davenport & Beck, 2002; 4. University of California study, reported in Financial Director, 2002; 5. "How Much Information? 2003", School of Information Management and Systems, University of California at Berkley, 2003.

05 Society

Electoral turnout, the most visible indicator of a democracy's health, has been dropping in the U.S. throughout the 20th century and in established European democracies since 1945¹ (more votes were cast in Pop Idol than in the 2001 U.K. general election²). It's understandable that governments are enthusiastically embracing what's loosely termed "e-democracy" in an attempt to encourage more active citizenship³.

Some see the Internet as a return to the more effective political system of direct democracy, where citizens gathered in the marketplace to discuss and vote on issues. (Although surely representative democracy was invented precisely because constant, collective decision-making doesn't scale effectively beyond small community town halls). Others, more reasonably, think the process of deliberation before voting is a key missing ingredient in modern democracy which can be re-invigorated through online debate.

But as a new medium for communication, the Internet is also a new means of social and political organisation. Connecting people to an instantaneous, global data network has enabled different kinds of electronic advocacy groups and grassroots political involvement. MoveOn, an influential U.S. outfit dedicated to using the Internet as the ultimate tool for democracy, regards activism like any other commodity: if you reduce the cost, people will buy more. The success of such digital campaigning by activist minorities — MoveOn recently mobilized a million e-mails and phone calls to Congress protesting against the war on Iraq and initiated thousands of worldwide candlelight vigils — makes this one of the Net's few true 'Killer Applications'⁴.

The BBC's iCan initiative is attempting to harness the energy and momentum of online activism to create new social networks, self-organised around neighbourhood (including consumer) issues, thereby promoting greater civic involvement. This is part of a larger movement which believes in replenishing our dwindling supply of relationships within society by using 'Social Software' — unique Internet applications for many-to-many group communications (see accompanying diagram).

The idea that the future of democracy might look very different if virtual populations spontaneously cooperate as a collective force, independent of governments, instead of simply existing as an assembly of individuals is an interesting one. But we should also be concerned that technology could lower the cost of participation too far and cheapen or trivialise the politics we're trying to revitalise.

People too disillusioned to traipse down to their local polling station and, if only symbolically, do something tangible to prove their

citizenship, might prefer to have voting re-packaged as an electronic coupon or a game show, but it's a depressing and dangerous idea. In reality, our crisis of political faith is based on a lack of confidence in politicians — this is not a technical problem and therefore unlikely to be solved by technology.

It's clear, however, that there is a trend in Western societies towards excessive individualism where, in effect, people only look out for themselves and those around them or like them. This is the result of fracturing trust in relationships with the state and employers (three quarters of U.S. and U.K. firms routinely monitor workplace communications⁵), coupled with a decline in traditional societal conventions like marriage (U.K. divorce rates have risen five-fold in the last 40 years⁶). To some extent this also goes together with the rise of a consumer society offering unlimited options from which everyone is supposed to pick only what suits them best⁷.

It's less obvious to what extent all this is actually 'de-socialising' society, but the Internet certainly mirrors (if not encourages) this trend and makes it easier to express individualism by finding and building alternative identity networks (e.g. computer gaming communities), which exclude the broader societal interest.

The Internet is actually becoming even more individualistic and mobile technology is making it more portable. Private communities can already organise themselves around tightly defined and self-selecting interests, values, friends and affinities. Take instant messaging software alone, which an estimated 320 million individuals⁸ are now using for private, real-time online dialogue with select people on their Buddy Lists⁹.

These digital shortcuts to the groups of people they interact with most are becoming the backbone of social networks which communicate and share information, content and resources among themselves (helped by open-source, peer-to-peer file sharing software like Gnutella and Kazaa). Perhaps reflecting society at large, these increasingly mobile communities are drawing users off the mainstream Internet onto smaller, more personal sub-Webs where people are more likely to be able to express their individuality and get hold of the information and services they really want because everything is tailored to their particular lifestyles and passions.

While it's perhaps too soon to say we're living in a Network Society, there's little doubt that the Internet will have a profound impact on the social systems that shape our lives. As *The Economist* perfectly summed up: "new electronic technologies deal with the very essence of human society: communication between people."

And Access For All

Shortly before Roosevelt's landslide victory in the 1936 U.S. presidential election, a public opinion poll confidently predicted his overwhelming defeat. Too many respondents had been picked out of the telephone directories and, as it turned out, people who had phones didn't make up a representative sample of the average American citizen.

Most people with computers in their homes have Internet connections, but PC penetration, and thus household Internet access, has levelled off in most developed nations (Sweden: 70 percent¹⁰; US: 60 percent¹¹; UK: 50 percent¹²). Even allowing for connectivity at work, school, university or via public access centres, and the limited Net capabilities of non-PC devices like the average mobile phone, this still leaves many millions of citizens who aren't online. (In fact, 56 percent of unconnected Americans, for a variety of reasons, say they don't ever want to use the Internet¹³).

A few years ago, the U.K. government shelved plans to transfer all social security payments directly into bank accounts when it was pointed out that around three and a half million people in Britain still don't have one. The Roosevelt lesson is worth remembering: if society is going to rely on technology, we need to be sure that everyone has equal access.

Types of Social Software and Modes of Use

Collaboration	Communication	Publishing
Wiki spaces (Wikipedia)	E-mail and text messaging (Hotmail, Outlook, Upoc, Axis Mobile)	Weblog diaries? (Blogger, Movable Type)
Multi-player games (Ultima Online, EverQuest)	Social networking sites (Rize, Friendster, LinkedIn, Tribe.net)	Group diaries (Livejournal)
Document Editing Systems? (Groove, Hydra, Lotus Notes)	Chat rooms and group discussion systems (SmartGroups, BBS, Usenet, IRC)	Personal Web space? (Geocities, AOL, MSN)
Open source annotation systems (Annotation Engine)	Instant messaging? (ICQ, MSN, Trillian)	Really Simple Syndication feeds (NewsGator, NewsIsFree, NewzCrawler)

Social software increases the value of social capital in proportion to the number of networked groups, users, links and subscribers. Sources: iSociety, "You Don't Know Me, but... Social Capital & Social Software," 2003; Ross Mayfield, "Social Capital of Blogspace" and "Ecosystem of Networks," 2003.

06 Marketing

The explosive growth of the Web since the mid 1990s was largely driven by business investment, so it's hardly surprising that it became much more commercial as a result. But in order to prosper, companies also had to adapt to the open values and communal social cultures of the Internet.

In the Net's anti-commercial, academic early years, intellectual property was theft; so everything that could be, was shared freely with no strings attached. Indeed, this open system of collaboration and peer review was how much of the net's software and content was originally created.

So when the e-commerce land-grab began, it's understandable that merchants were expected to offer something more than the customary exchange of goods for money. Many firms were forced to compete with cut-price or loss-leader sales models as more than half of shoppers expected a 20 to 30 percent discount online¹ and the 'something for nothing' Web culture turned most unique content into a free commodity.

But a handful of smart marketers turned all this to their advantage with some startling successes. Most famously, the Web revolution itself was kicked into top gear in 1994 when Netscape – the company co-founded by Mosaic inventor Andreessen – achieved market leadership by giving their browser away to as many consumers as possible².

But the challenge that seems to confound and confuse many traditional marketers to this day, is understanding how a medium based on interactive communications really functions (and thereby how to successfully market within it). About half the users regularly surveyed find banner advertising on Web sites "very annoying" and 80 percent of them say the same about pop-up advertisements³. Add to this the fact that 50 percent of e-mail is unsolicited junk⁴ and you'd be forgiven for concluding that marketing on the Internet simply doesn't work.

The truth is that a lot of companies market online rather poorly. What doesn't work tends to be based on the traditional model of interrupting the passive consumption of broadcast entertainment on radio and television or turning up on your doormat uninvited like direct mail. But online, consumers are far more actively engaged and often focused on achieving specific goals. The marketing that works in this context is what most people don't even consider to be marketing because it offers genuinely helpful information that adds to, rather than diverts them from, the task in hand.

Ironically, traditional marketing rules apply: reaching the right person at the right time, in the right place with the right message —

Amazon's much-imitated "if you bought X, you might also like Y" personalised recommendations, for example. And Google has become one of the world's largest and fastest growing online media properties⁵ by only allowing informative advertising text that specifically relates to a user's search — so you'll never see a sponsored link for beer when you're looking for information on sport.

Since the crash in 2000, online marketing has actually been growing much faster than its traditional counterparts (by 19.1 percent compared to 1.6 percent for offline media advertising between 2001 and 2003⁶) for two main reasons: First, because marketers have woken up to the fact that millions of consumers spend a significant part of their lives online. The Web plays a major role in making almost all important life decisions (jobs, healthcare, education, investments⁷) for nearly one third of the 181 million wired Americans⁸. And as 'virtual space' becomes ever-present — multimedia mobile phones, wireless laptops and PDA's, WiFi networks in homes, offices and high streets — the Internet is an increasingly part of how customers interact with the world and brands around them.

The second reason is that the old media maxim, "I know half my advertising dollars are wasted — I just don't know which half!", no longer holds true online. Digital marketing growth has been fuelled by increased demand from established brands (traditional advertisers doubled their use of the Internet between 2000 and 2002⁹) who recognise that in sluggish economic times, the Web gives them the means to measure precisely what works and what doesn't. British Airways, for example, rigorously tracks the net income from ticket sales (stripping out all marketing and carriage costs) generated by online campaigns. Their analysis shows that for every pound (the equivalent of \$1.67) they spend on Web campaigns in the U.K., they get £49.14 (\$82.02) back¹⁰.

Ultimately, though, the aim of any multi-national campaign should be to widen the reach of their brand and break into new markets. A few years ago, the number of consumers who could be directly accessed in Asian markets, for instance, was very small. Today China has the world's third largest Internet audience (around 46 million), Japan the second (56 million)¹¹ and South Korea has about the same number of broadband households (10 million) as the whole of Europe¹².

But, according to some estimates, although only one quarter of the global net population will reside in North America by 2005, just one-third of U.S. businesses online are focusing on world-wide opportunities¹³. In spite of all the recent doom and gloom, the global economy is actually growing by two to three percent a year¹⁴. The market as a whole is still expanding, so for one firm to win, somebody else doesn't necessarily have to lose.

Daytime Primetime

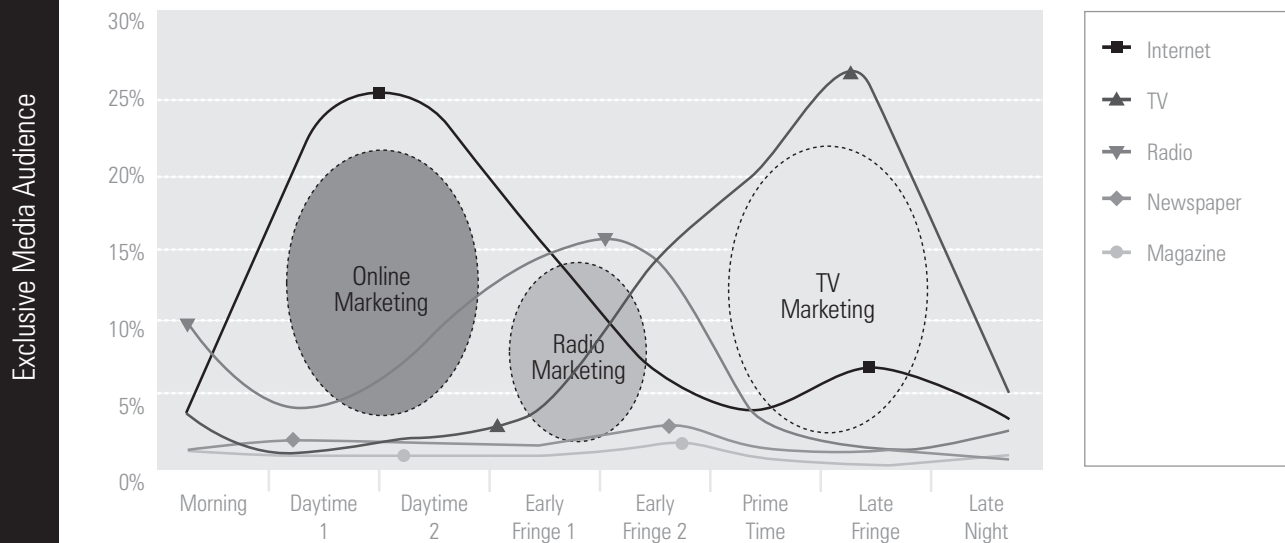
With a greater part of the economy shifting to knowledge-based activities, there's less separation between private and commercial life; people work when they're at home but send personal e-mails and book holidays online at the office. This all makes statistical calculation of commercial productivity in the information age highly unreliable. So much of the economy is based on mental output that it's impossible to measure when, where and for what purpose this brain power is being produced¹⁵.

As a result, "Daytime" has become "Primetime" for Internet marketing. At work, U.S. Web audiences now spend more time online (34 percent of total media minutes, not including e-mail) on a typical Monday through Friday than they spend watching TV (30 percent¹⁶). Indeed 60 percent of the \$45 billion¹⁷ spent online by American consumers in 2002 occurred in the workplace, compared to 36 percent from home¹⁸. And for a quarter of the six in 10 U.S. workers who now have office Net access¹⁹, the Web is the only media consumed during the day²⁰.

This had led to the rise of "Daypart" advertising where specific times are purchased during the work day to reach a target audience online when they are making their purchase decisions (although not necessarily purchasing). And as the accompanying chart shows, this has also led to more time-based, integrated media planning. For example, online marketing during the day, radio commercials during the early evening and TV advertising at night.

"Computer technology is ... dissolving the boundaries of space and time that confined work to particular offices and factories and to monitored hours of the day." —*Diana Coyle, columnist and broadcaster, formerly Economics Editor of The Independent*

Time-Based, Integrated Media Planning



Source: Millward Brown IntelliQuest, 2001.

"Witness the modern automobile, ever more simple to use, ever more complex inside. Contrast this with the modern computer: ever more complex inside, ever more difficult to use." – Professor Donald A. Norman, co-founder of the Nielsen Norman Group

07 Usability

"If automotive technology had kept pace with the computer industry," said Bill Gates, "we'd all be driving \$25 cars that did 1000 miles to the gallon." General Motors replied, "Yes," "but would you want your car to crash twice a day?" This fictional exchange, part of the Net's growing apocrypha, illustrates the love-hate relationship between man and machines: they promise the world but let us down on a whim¹.

The need to deliberately think through how humans interact with new technology started when machines became both more complicated and less traditional than ever before. In the industrial revolution, for example, craftsmen could fall back on a long line of tradition to make a better horse-drawn coach, but no such guidance from the past existed for locomotive design. Rapid mechanization forced designers and engineers to think things out from scratch and take into account people's physical and psychological characteristics in order to make the innovations as practical and usable as possible.

As a result, creating efficient interfaces between the biological human computer and the silicon systems that are meant to make our lives easier has always been central to the development of communications technology. And, as the browser became our universal means of access to a global network of information systems, the science of interface and information design became increasingly important to the development of the Web.

Today, it is universally acknowledged that on the Internet, bad usability is bad for business. Forrester Research estimates that one million e-banking customers were lost in the U.K. alone in 2002 because of poor online service design².

This applies equally to non-commercial transactions. A comprehensive international study at the end of 2002 concluded that the most successful e-government initiatives focused on user-centred design rather than just making state services available online³. For instance in Canada (the number one ranked e-government⁴ with 90 percent of services on the Web, used regularly by three quarters of businesses and nearly half its citizens), the front-end interface and back-end processes were specifically architected around the needs of mainstream civilian users.

Usability evangelists Jacob Nielsen and Donald Norman preach that: "The Internet obeys a kind of Sheer Design Darwinism: survival of the easiest." The point is well made although somewhat reductionist. Progress in an emerging medium based on creativity and innovation relies on lots of people constantly trying new things. Lowest common denominator interface principles are important, but so is

the trial and error that helped make the Internet the fastest-growing network in recorded history.

And of course the usability of any system can only be properly judged against the requirements of its intended users, who may not necessarily be the general public. How easy an airplane instrument panel is to read depends on whether you're a pilot or a passenger.

On the other hand, it has usually been just a question of time before a current generation adapts to new technologies. People selling telephones were once condemned in the press as charlatans attempting "to extort funds from ignorant and superstitious people" by claiming to send human voices down wires⁵.

Even if a technology interface is easy to understand, it's equally important to simplify the business organisation behind new products and services, to make them straightforward to use. Mobile phones, for instance, only became truly mass market in the U.K. (between 1998 and 2001, ownership of mobile phones almost tripled from 27 percent to 73 percent⁶) with the introduction of prepaid phone cards and the concept of pay-as-you-go services.

Come to that, the success of Napster and its file-sharing progeny (Kazaa, Morpheus, et al) was probably less to do with the technological sophistication of kids than its compellingly straightforward business proposition of downloading free stuff.

Making every Web site conform to Darwinian accessibility standards may not be the answer, but just because there will always be progressive, "early adopting" niche markets, we shouldn't assume that eventually everyone will reach the same level of technical sophistication. Cars were originally built for mechanics and specialist professionals, but had to be completely re-thought when the drivers became ordinary members of the public.

Successful mass market online products and services (Yahoo, Google, Amazon, eBay) have always been designed, like automobiles, for people who don't understand technology. "The problem with most computer companies," as Nicholas Negroponte once said, is that they still involve "one geek making computer programs for another geek. There is nothing for the man on the street." The Internet's remarkable success up to this point has been achieved against the odds. By any consumer criteria, today's Web is a horribly complicated and user-unfriendly environment, demanding far too much hi-tech know-how (not to mention time). Just think for a moment what could happen if computers and the Internet actually became easy to use. The potential is unimaginable.

Child's Play

The younger kids are, the faster they adopt new technology⁷. For the 97 percent of U.S. 12-18 year-olds who were online last year⁸, and the 60 percent who access the Web daily⁹, the Internet is simply the way the world works. The next generation of hyper-wired consumers are growing up using the latest, high-tech communications devices to talk to friends, play games, check out music, do their homework and search for jobs.

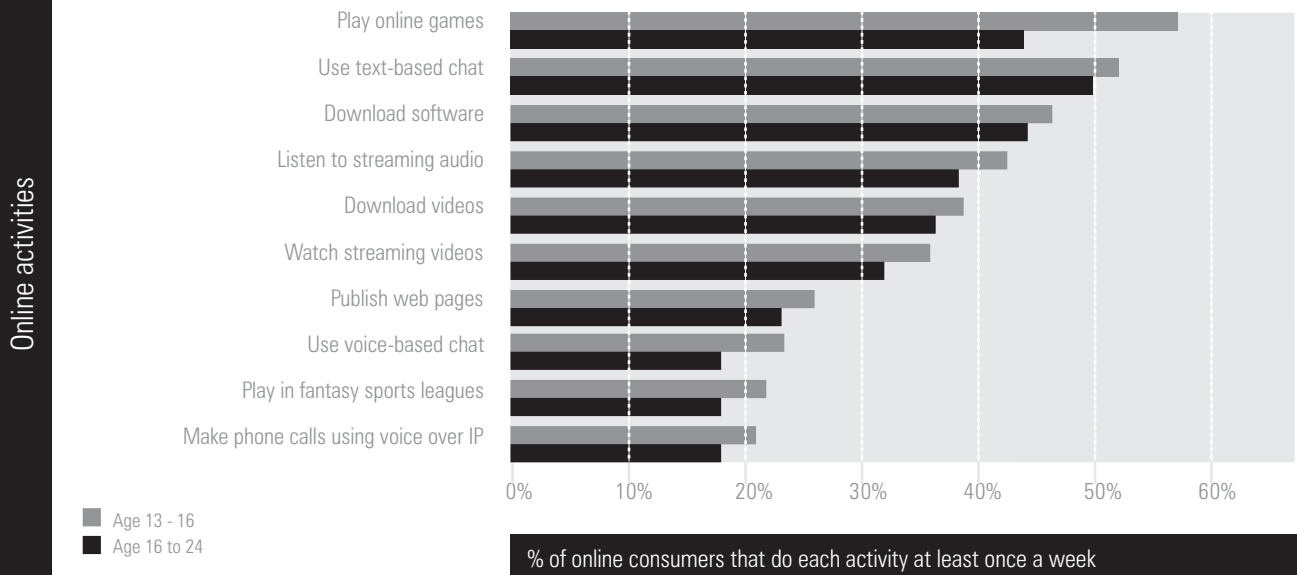
"Technology is only technology for people who were born before it was invented." —Alan Kay, co-founder Xerox Palo Alto Research Centre

As the Online Publishers Association recently summed up: "What lies ahead is a generation of consumers that grew up with [the Web] as part of their media landscape. By the time they're college age and entering the workforce they'll have been online for 10 years¹⁰."

To some extent, 86 million tech-literate Americans between the ages of two and 23¹¹ are bound to encourage the development of more advanced online products and services in the future¹². But good usability will still be a requirement; a study found that young children are as likely as adults to get frustrated and give up when using poorly designed sites¹³.

Meanwhile, programming video recorders will still be second nature to children, while remaining far beyond the reach of most of their parents. PCs won't need manuals in the future; they'll just come with a free five year old¹⁴.

Within the Youth Market, the Youngest Adopt Technology the Fastest



Source: Forrester Research Inc., "Young Consumers Data Overview," March 2001.

"The net interprets censorship as damage and routes around it."

– John Gilmore, online activist

08 Freedom

The Internet was a cold war baby conceived by military scientists suffering from 60's nuclear neurosis. Their strike-proof system was designed to automatically re-direct messages along the fastest alternative route when pieces of a communication network were destroyed. Activist John Gilmore famously observed that this made censorship impossible as information flows could always find other ways to reach their destination.

But while the original architecture of the Net encouraged freedom (the physical infrastructure was made up of individually owned and controlled wires, but most of the code and ideas that gave it life were freely created and exchanged), there was never anything to stop that architecture being manipulated to suit more controlling commercial, political or ideological agendas.

Pressure on individual privacy started with the commercialisation of the Web when collecting, storing and using customer data for more targeted marketing became an essential part of successful e-commerce. (Today almost nine out of 10 Americans online don't believe firms' assurances that they will not share or sell their personal data¹, while a privacy policy is the single most important factor for Europeans choosing where to shop online²).

And it was only a matter of time before governments tried to monitor as much as they possibly could (regardless of civil rights). After all, state power has always rested, to some extent, on controlling the open flow of communications. Internet technology gave authorities the ability to do this on a much greater scale and keep their eyes and ears on virtually all domestic and international traffic.

The so-called Snoopers' Charter, for instance, (otherwise known as the Regulation of Investigatory Powers Act), introduced by the British parliament in 2000, gave state agencies the blanket right to access records of all calls made, sites visited, and e-mails sent and received.

And there's now a booming trade in selling the high-tech surveillance and filtering technology used by Western governments to authoritarian regimes in the east³. In China, for instance, Amnesty International reports that more than 30,000 state security personnel are involved in monitoring and censoring Websites, chat rooms and e-mails. 'The Great Firewall of China' has blocked access to around 500,000 banned foreign news and politically-sensitive sites, and restricted keywords on search engines⁴.

But although Internet technology may now be a powerful tool for censorship, the real dilemma for developing nations, hungry for economic prosperity but under authoritarian state control, is that democracy and free speech are proving essential for e-commerce. Thriving trade demands a fast, open exchange of information.

The problem this poses for censoring bodies is that messages from political dissidents can easily be disguised as commercial reports⁵. Should Chinese officials risk the blood oranges developing into a new revolutionary movement, or delay all genuine, time-sensitive, data about crates of fruit?

And given that online expansion is a major part of many developing nations' economic plans⁶, it seems certain that Internet populations will grow fast in technological sophistication as well as size and become much harder to monitor and control⁷ (current Chinese security systems are already far from foolproof⁸). The Internet may not have overthrown the world's dictatorships overnight, but that doesn't mean that this battle isn't still being fought or that the net won't continue to be a major force pushing towards more open and democratic societies.

As for personal privacy – arguably under threat since the invention of relatives and nosy neighbours – it will always be in the interests of governments and business to keep this complex issue fluid and flexible. And there's unlikely to be much opposition in the West since only a few hardcore politicians and geeks seem to understand or care about its full implications. (It's a lot easier to mobilise popular opinion to "save the whale" than "protect my personalisation data" – especially when something affects people one-by-one rather than as a mass public).

Our only hope is that a combination of cross-departmental government inefficiency, ever-increasing errors and inconsistencies in the data itself, and the unwillingness of corporations to share information that could provide a competitive advantage, may hold back the creation of the ultimate, centralised, all-knowing database of every citizen and consumer.

But whichever way you look at it, modern communications and civilization make it impossible for people to live private lives. It's another nasty by-product of our process of economic and technological development. Access to confidential databases is so widespread there's no use saying "this shouldn't happen." – It's here and it's happening. We may never find full answers to the civil rights questions of the 21st century: who has the authority to hold what kind of data about us, and what power do we have to see or edit our "confidential information" and understand how it is being used?

The best we can hope for is to make those trading in our personal details accountable for its fair use. No one (apart from some governments) planned it this way, but the genie is now so far out of the bottle its medical records are being auctioned on eBay. As Sun Microsystems' CEO, Scott McNealy, famously summarised: "You have zero privacy anyway. Get over it".

Identity Crisis

There's a paradoxical desire for both anonymity and celebrity on the Web: we demand greater individual privacy but also our "15 minutes" of fame, publishing personal blogs and Web pages to the world at large.

Either way, the growing scale of ID fraud highlights how much of our identities are now bound up in the data that's held about us online. We increasingly represent ourselves virtually with usernames, passwords, sims, pins and digital addresses, and it's a lot easier to pretend to be an account number than a physical human being.

"On the Internet, nobody knows you're a dog."

— Peter Steiner cartoon in *The New Yorker*, 1993

It's just as simple to counterfeit major brands online. Impersonating a high street bank in the physical world takes a lot more than a night's work with Photoshop. But bogus e-mails now direct consumers to replica Websites which easily trick them into handing over confidential account details¹⁰.

There's nothing new about stealing someone's identity to commit fraud in their name, but you'd have to trawl through a lot of rubbish bins for discarded credit card receipts to match the 40,000 card numbers that can be hacked from a single e-commerce system¹¹.

ID theft is reckoned to be one of the fastest-growing white-collar crimes¹²: 37 percent of the previous five years worth of U.S. identity fraud took place in 2002, costing businesses and financial institutions nearly \$48 billion and consumer victims \$5 billion in out-of-pocket expenses¹³. (Not every victim knows how to report it or even that it's happened at all, so the true extent could be far greater).

So far the net has been notorious for making it as easy for a kid in Kamchatka to perpetrate major fraud as a highly skilled accountant on Wall St. But given the sheer scale of modern criminal activities — money laundering alone accounts for up to 5 percent of global GDP — we're only just starting to see the full effects of professional villains getting serious about cybercrime.

Censorship of Messages Posted on Chinese Online Forums

Date & Time GMT	Message Content	Web site	Appeared Yes / No	Time it Remained
3 March at 12.00	Call for free elections	Sina.com.cn	Yes	14 minutes
4 March at 14.00	Lack of debate in China on war in Iraq	Iraq forum of Sina.com.cn	Yes	1 hr 40 minutes
10 March at 14.00	Concern about Liu Di	Xinhuanet.com	No	
11 March at 11.00	Free Huang Qi	Sina.com.cn	Yes	40 minutes
11 March at 15.00	Criticism of judicial system	BJYD (Beijing Youth Daily)	Yes	Not removed
14 March at 13.00	Lift ban on a magazine	Sina.com.cn	Yes	Less than 2 minutes
14 March at 13.00	Interview with a reformist leader Li Rui	Sina.com.cn	No	

In 2003, the BBC World Service and Reporters Without Borders posted subversive messages to Chinese online forums: some were automatically blocked by filtering technology scanning for suspect keywords and phrases, others made it through but were removed within minutes or hours, but a few remained uncensored.

"He who receives an idea from me, receives instruction himself without lessening mine; as he who lights his taper at mine, receives light without darkening me." — *Thomas Jefferson, third president of the United States*

09 Content

The war for content in the 21st century is being fought in cyberspace between Silicon Valley, using content to open up new markets and fuel the adoption of their latest inventions¹, and Hollywood, scrambling to use a combination of new software and copyright laws to tightly protect their intellectual property until they have the right means to establish lasting, moneymaking control.

Two factors make this clash particularly explosive and help to explain the extreme, panicked reactions from copyright holders. Firstly, law always lags behind technological progress but there's usually been time to rethink the necessary copyright protections to accommodate advances like phonographs, photocopiers or VCRs. The Internet, however, was a double whammy — both the technological constraints and the legal protections preventing perfect copies of any content being made by anyone at anytime seemed to vanish simultaneously, and at lightning speed.

Secondly, and equally importantly, new technology can widen the market enormously and create new demand that might not otherwise exist. So the development of recording made it possible for a singer to earn immeasurably more than even the highest box-office income since audiences no longer had to be physically present to hear their voice. In this sense, copyright tends to increase in value with technological breakthroughs and, as the commercial stakes become much higher, the pressure becomes greater.

Part of the tension between these opposing forces of freedom and control can be explained by telecoms analyst David Isenberg's comment, "the milk of disruptive innovation doesn't flow from cash-cows²." In other words, the five largest corporations who control more than 84 percent of the U.S. music market³ are naturally scared that in embracing new ideas like MP3s distributed online they will cut into the enormously lucrative traditional sales of their products. (As so often with capitalism — especially the capitalism dominated by a handful of conglomerates — short-term profit gets in the way of longer term prospects).

As a result, these kinds of vested interests have created dangerous impulses to over-control the flow of ideas in cyberspace. For instance, influential Economist Paul David believes that modern global scientific collaboration (which has traded for years in information that most scholars thought were morally supposed to be free) is now under threat as "intellectual capitalism" encourages businesses to "press for the protection of private rights to exploit the contents of [academic] databases as legally owned intellectual property⁴."

This IPR land-grabbing, coupled with a seemingly endless series of extensions to existing copyrights⁵, could seriously undermine scientific and artistic (and ultimately commercial) progress. For this progress has always been part of a delicately balanced ecosystem where the public domain is constantly fertilised by decomposing intellectual property rights (IPR)⁶. As these old ideas (from the works of Shakespeare to Einstein's theory of relativity) become freely available for re-use, they act as nutrients to feed a fresh crop of creativity and innovation — after all, nothing is truly new anymore as all ideas stand on the shoulders of giants that have come before⁷.

The root of the conflict lies in the difference between the economies of atoms and bits. It's well-understood that in the analog world, I cannot share someone's property (house, car, clothes) without limiting their ability to use it. Ideas, on the other hand — and now anything at all stored as ones and zeros — can be enjoyed equally by 10 people or 10 million people without depleting their supply.

Furthermore, selling content in the physical world has always been a two-stage process. Buying a newspaper or DVD enables you to get hold of the information stored within it. Online, however, it's a single-stage process: there's no need to package and deliver ideas in a physical form — the information can be accessed directly. The future, as former BT chief technologist Peter Cochrane once predicted, is therefore going to be less about copyright than access right⁸.

The ultimate danger is that the era of perfect mechanical reproduction might be accompanied by an age of perfect copyright protection. Copyright was never meant to be about complete control. You don't need to ask permission to quote a John Lennon lyric on a friend's birthday card (even if technically you might be required to, effectively there's no way to enforce it). But increasingly these kinds of communications are happening online, in a medium where, with the right technology supported by the wrong laws, they can be surveyed, monitored, investigated and, ultimately, controlled.

As prominent Stanford cyberlawyer Professor Lawrence Lessig argues, the Internet was built on free, openly shared code — from Perl, Linux and Apache software to sendmail and the Web itself. Too much protection could limit the tremendous possibilities and future value of this extraordinary social, cultural and commercial phenomenon (and smother the very innovation and creativity copyright law was partly designed to encourage). The Internet's full potential has barely begun to be discovered; it makes sense to allow plenty of freedom for experimentation until the best uses are found.

Virtual Worlds

In terms of purely commercial content, the \$9.4 billion a year computer and video gaming industry is now bigger box office than Hollywood⁹. A third of all Internet users¹⁰ spend 11.1 billion minutes gaming online every month (more time than is spent on e-mail¹¹).

“From an economist’s standpoint what’s happening in these games is real ... those who claim to be living and working in Norrath, and not on Earth, may actually be doing just that.” – *Edward Castronova*

A massive part of this success is because audiences¹², in effect, create the content. The 500,000 people that pay Sony \$12.95 each month to spend up to seven hours a day¹³ immersed in their multiplayer online game EverQuest aren’t just interacting with the story, they are the story.

And these virtual environments have become important not just emotionally but also financially in their lives. As online

gaming artefacts are traded on auction sites for hard currency, elaborately constructed virtual game economies spill over into the physical world. Buyers and sellers exchange real dollars before the transaction is completed in game space, where the digital goods are handed over by one avatar to another.

Analysing the exchange of products and services for virtual currency within game worlds and real U.S. dollars in online auction sales of gaming avatars and booty, economist Edward Castronova¹⁴ calculated that the 410,000 residents of EverQuest world Norrath earn an average of \$3.42 every hour of play. This puts the game’s per capita GNP at around \$2,266 — larger than China and India and enough to make Norrath the world’s 77th wealthiest nation, just behind Russia.

Communication System Layers

	Speakers’ Corner	Madison Sqr Garden	Telephone System	Cable TV
Content (information transmitted)	Free	Free	Free	Controlled
Code (software, protocols)	Free	Free	Controlled	Controlled
Physical (hardware, infrastructure)	Free	Controlled	Controlled	Controlled

Table illustrates the different ways of organising communication systems. From Speakers’ Corner where everything is free: what people say (Content), the language they use to say it (Code), and the space they say it in (Physical), to Cable TV where everything is controlled: the wires that transmit the content, the decisions about what gets shown and the copyrighted TV programmes. Source: Lawrence Lessig, “The Future of Ideas - The Fate of The Commons In A Connected World,” 2001 (based on a concept developed by NYU law professor Yochai Benkler).

10 Profit

There are two ways of looking at the impact of the Internet on profits. From the point of view of individual businesses, it’s purely about bottom-line results. But in a wider sense, we also need to consider the cumulative gains to the economy in general from all these commercial activities. (Although, since Web technology has created highly inter-connected networks of trading partners, the financial health of anyone a firm has dealings with today is a much more relevant factor to their own profits¹).

In the mid to late 1990s, most people expected the Net to be a new, stand-alone enterprise, or at least a separate business unit. Many business leaders asked: “How can the Internet be profitable for me?” But this was the wrong way to frame the question. The Internet is not a new and discrete business entity, but part of the way an entire enterprise operates and goes to market. For example, ‘Vice President, Internet’ used to be a common U.S. job title a few years ago; today it would seem as redundant as ‘VP, Electricity’.

The trick for businesses wanting the Internet to drive greater profits is using it as a lower-cost, higher-quality channel for the activities to which it is best suited. The deepest, most immediate profit improvements have undoubtedly been on the supply side: speed and cost-efficiencies in how companies hire, pay, utilise and develop employees internally and how they coordinate and organise external production and distribution and partnerships².

Inevitably though, as companies squeeze out more and more inefficiencies, supply-side returns will diminish and any strategic competitive advantage will also decrease as this aspect of interactive technology becomes rapidly standardised and widely adopted. As a result, more attention has now started to shift to the demand-side of the business: using the Internet to drive top-line sales growth, increased market-share, and create satisfied, and ultimately more profitable, customers.

There are many situations where the Internet contributes to direct sales and customer service for existing businesses. But even though the net has proved hugely successful in helping consumers buy ‘high consideration’ goods such as property and cars³, it’s the firms selling virtual products and services who can interact most completely with customers online.

Because travel⁴, financial services, gambling and utilities companies (energy, fixed line and mobile telecommunications) are selling invisible and intangible goods to begin with, it’s actually easier for customers to consume information about these products and services in an interactive medium⁵. For example, travel customers couldn’t physically inspect a holiday before purchase even if they wanted to. And online comparison and research tools can be pretty sophisticated compared to the real retail ‘dumb terminals’ — poorly

trained, spotty 17 year old mobile phone shop assistants who can’t answer any of your questions!

It’s also easier for firms in these industries to service and cross-sell to their customers online. Airlines, for instance, are no different to financial services firms in the sense that it’s more convenient and cheaper to process and fulfil the actual transactions purely digitally (e-ticketing and online check-ins, loan applications and fund transfers, managing frequent flyer miles or bank statements, etc). And, wherever possible, to ‘channel shift’ lower-value, higher-volume customers (the infamous 80 percent that contribute just 20 percent of the profits) into servicing themselves online.

For BT, customers who manage their account online order 10 times as much as customers receiving paper bills, with a higher level of satisfaction: 98 percent are satisfied with the service and 97 percent would prefer to use only online billing in the future. BT’s call centre costs have also gone down as online customers prefer to make service enquiries via the Web⁶.

And in a recent productivity study of firms using online applications to automate business processes, 47 percent had improved customer satisfaction by responding to and resolving customer inquiries much faster (e.g. customer self-service on the Web). Networked manufacturing, retail and financial services businesses also averaged more than an 11 percent reduction in customer service operating costs over the last 12 months⁷.

Of course it’s more difficult to measure the true impact of the Internet on economy-wide profits because national productivity and other growth statistics are mainly based on the output of goods rather than services, which form an increasingly large part of the most modern, information-based economies. (It’s much harder to track the output of brain-power than assembly line widgets). Measurement is further complicated by the fact that globalisation means less and less production stays within national boundaries.

And as Harvard Business School professor Nancy Koehn points out, consider the ripple-effects of the railroads on American businesses. Once corporations could produce for markets thousands of miles away, the increased opportunities changed the scale and scope of modern enterprise. As a result firms organised themselves very differently and a wave of innovations, jobs and services were created to meet these new business needs: secretarial pools, middle managers, typewriters, elevators, and so on.

The true impact of the railroads 20 years old was breathtaking, and by the same measure, the longer-term economic (not to mention social, political and cultural) effects of the Internet are probably equally inconceivable today.

Information Networks

Networks are the oldest form of business organisations but proved less and less effective as their size and complexity grew. By the late 19th century relentless standardization, at the expense of consumer choice, was the most efficient way to manage sophisticated, mass-scale production and control costs for a highly price-sensitive market. To achieve this, companies had evolved into vertically-integrated hierarchies handling everything from manufacturing of component parts to marketing themselves.

But as post war consumers' disposable income grew, they demanded more choice to better reflect their diverse, individual tastes. For example, between 1960 and the mid-1970's in America, the market share of colourful, patterned sheets rose almost four fold, while sales of plain, white bedding fell by the same amount⁸.

Simultaneously, new communications innovations (from EDI and faxes to, eventually, the Web) were once again making networks the most profitable way to co-ordinate manufactur-

ing and distribution for a fast-changing market. Thus business moved from the vertically-organised, command and control, mass production of Ford ("Any customer can have a car painted any color that he wants so long as it is black.") to the more flexible, relationship-based, just-in-time production networks of Toyota.

Today, where Benetton once blazed a trail using information networks to reduce the retail cycle of design, production and distribution to six months, and which the Gap later cut to two months, Spanish-owned Zara now uses the Internet to do in two weeks. Shop staff constantly capture and profile data about customers' behaviour on handheld devices. This information is batched and sent daily to the design and logistics centre in La Coruña where a team of 200 designers modify existing patterns or create new ones based on real-time market intelligence. Designs are then transferred to computerised cutting facilities and assembled in factories via the company intranet. This flexible, network-based operation allows Zara to make and ship 12,000 new designs and over 90 million articles of clothing every year, and re-stock 593 stores in 44 countries twice a week.

Company	Activity	Savings
Philips Medical Systems ¹	Individual extranets created for 55 dealers in global supply chain.	70% reduction in document distribution costs saving \$3.5 million over one year.
Ford Europe ¹	'E-feasibility' project allows engineers and suppliers from around the world to collaborate over the Net.	\$27 million saved on Fiesta development: prototype costs cut by 15%, time to market by 2 months and warranty costs lowered via 35% reduction in defects.
FedEx ²	Automated customer package tracking process on the web.	Over \$35 million saved per week from nearly 3 million customers a day self-tracking packages on the web (\$0.04 per web transaction vs. \$2.40 for each telephone enquiry).
Samsung ³	Operations based on information networks drive internal efficiencies managing knowledge, customer relationships and a global supply chain.	Resulting profits estimated at \$6.2 billion vs. the \$1.5 billion invested. Reduced inventory level to \$2 billion from \$3.5 billion and non-performing accounts receivables from \$4 billion to \$2.2 billion.
All US firms ⁴	Sharper inventory and production management, forecasting and supplier communications.	Economy-wide productivity gains of \$450 billion per year by 2005 (the equivalent of raising the average U.S. household income by \$4,500).

¹ Cisco case study - 2002, ² The Economist - 2003, ³ The Korea Herald - 2003, ⁴ Business Week - 2003.

"The Internet and the things that will come out of it are around the level of the 1908 Hurley washing machine. The electric outlet hadn't been invented yet. Nor had the on-off switch." — Jeff Bezos, founder and CEO of Amazon.com

Revolution or Evolution?

The forward march of technology is nothing new, but there are moments in history when it has advanced in dramatic leaps and introduced the ability to do things which simply could not have been done before. By changing everything, these kinds of technological breakthroughs became central to society and the economy as a whole.

Innovations like the jet-engine can transform industries, but compared to truly revolutionary inventions such as the airplane itself or the discovery of oil and electricity as mass-scale energy sources, they are incremental improvements, not qualitatively new phases of development. The key question is: into which category does Internet technology fall?

Nowhere has this question of revolution versus evolution been more hotly debated than by economists looking at the effects of information processing on economic output¹. But last year's economic research by the U.S. Bureau of Labor Statistics delivered convincing proof that the technology-powered American productivity revival was in fact real. U.S. productivity continued to grow, despite the slump, by an average of 2.5 percent a year from 1995 to mid-2002 (almost one percent higher than the previous 22 years²).

Even so, short-term productivity is only part of the story. The significance of Web technology goes beyond simply providing a healthy return on investment. The case is very strong indeed for seeing the Internet as a step-change in how businesses produce and distribute goods and services.

Economists Diana Coyle and Danny Quah³ hold that the Internet now resembles other general purpose technologies such as steam power or electrification which eventually revolutionised the global economy. By now, online technology is everywhere in society and it's hard to think of any industry to which it is not relevant. It also fits perfectly with other emerging technologies (such as biotech and robotics) and shows the potential for continual improvement and innovation.

Perhaps the most accurate comparison to make between today's extraordinary advances in information processing and the history of the industrial revolution is the early 20th century invention of the internal combustion engine coupled with highly portable, new energy sources. These laid the foundations for Ford's modern system of mass-production and revolutionised transportation and communications technology, which meant an entirely different way of organising enterprise and living our lives.

So it's probably just too early to judge the full effects of the Internet revolution. As economist Paul David noted⁴, it took fifty years before electricity could generate economy-wide productivity improvements because there's always a time-lag before companies understand and reorganise themselves around new technology.

Since the commercial Web only really got going in 1995, it is natural that companies should still be trying to work out how to use the net most effectively and we'll see the biggest changes over the next 10 years and beyond. More than producing direct gains from faster processing, the Internet is likely to make its real impact by changing again how business operates, creating network-based organisations which work in radically more productive ways.

Critically, the engine that has powered the phenomenal progress so far is still going strong: Moore's Law, a formula for predicting exponential growth based on doubling the processing capacity of microchips every 12 to 24 months has been the cornerstone of technology advancement for half a century.

According to some calculations, computing power has increased a billion-fold every decade since the end of the 1950s⁵, while prices dropped 10,000-fold during the same period⁶. Not only is there evidence to suggest that Moore's Law will continue for another 50 years⁷, but the pace of change may be accelerating⁸.

Perhaps one reason it has proved hard to assess the Internet's true impact is the difficulty of pinning down exactly what it is. Unlike innovations such as electricity, the net doesn't just make possible new opportunities and experiences — it is itself a new medium in which things can be experienced differently. And whereas media appliances like the telephone or television are isolated to a single use or experience, the Internet augments how individuals choose to socialise, work, play, learn, consume, transact and communicate.

In sum, the Internet represents a monumental range of possibilities. And we've only just begun to glimpse the potential of recent developments like high speed, always available broadband connectivity as it becomes more widely adopted.

Meanwhile, we shouldn't underestimate the countless little revolutions over the last 10 years that have already brought about significant social, economic and cultural changes⁹. In many ways, since the introduction of Mosaic, the integration of online access into every aspect of daily life has been so complete that we don't even notice it's there anymore.

The conclusion can only be that we haven't even scratched the surface yet, and that the next decade(s) will bring us unimagined, fascinating and profound transformations. But don't expect a smooth ride. As Berkeley's influential sociologist Manuel Castells warns, extreme market turbulence and volatility is now part of the information age in which we live: don't think of the Internet economy as a bubble, "it's fizzy water."

Revolution or Evolution?

Productivity Paradox

For years massive technology spending did not demonstrate any measurable and specific returns. This was the so-called "productivity paradox." American firms bought, on average, 24 percent more computers and software every year from 1980 onwards¹⁰, culminating in \$2 trillion worth of purchases during the 90's¹¹. But the only thing economists all agreed on was the startling productivity improvements in technology itself and the companies that make it.

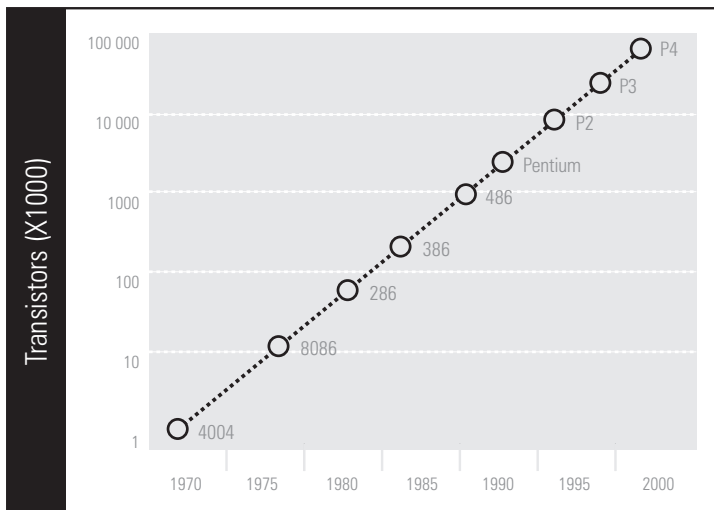
"You can see the computer age everywhere but in the productivity statistics" –Nobel economist Robert Solow

During the boom it was hard to disentangle technology-specific output from the overall increases you'd naturally expect to follow the longest economic expansion in U.S. history (even hair salons more than doubled productivity in the second half of the 90's). The learning curve effect, for example, says that labor productivity increases by up to 15 percent when output

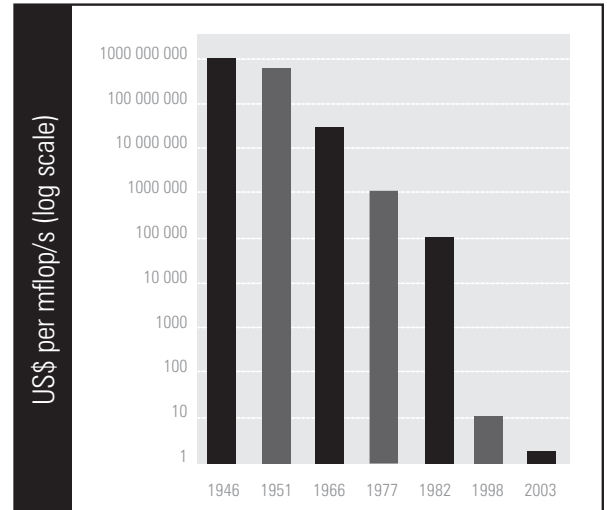
doubles as workers learn how to become more efficient. Plus firms tend to push staff harder to keep up with demand in prosperous times.

According to the most recent figures, however, three quarters of America's significant productivity gains during the last six and a half years can be attributed to constant increases in computing performance coupled with falling prices and the hi-tech industry manufacturing computers, semi-conductors and mobile phones¹².

This supports the case that the Internet — and the cluster of related digital technologies it links together and represents — should be considered as an emerging general purpose technology (GPT). High-growth of output and productivity in the innovating sector itself is the first stage of development of a new GPT. This is then followed by a phase of wider investment and improvements in economic output in other industries, and finally long-term gains across the whole economy¹³.



Moore's Law. Source: "Getting the measure of the new economy," iSociety, 2002.



Falling cost of computing power. Source: Intel, from Diana Coyle, "Hype and Reality in the New Economy," LSE, 2003.

Endnotes

Network of Networks

- 1 National Center for Supercomputing Applications at University of Illinois.
- 2 Gartner G2, 2003 (figure doesn't include revenue from software services).
- 3 Gartner G2, 2003.
- 4 U.S. consumers performed 14 billion ATM transactions in 2003 according to Dove Consulting reported on ATM Marketplace.com, 2003. In an e-mail correspondence with Tony Hayes, Managing Director of Dove Consulting's Financial Services Practise, he estimated an annual total of 42 million transactions worldwide.
- 5 ForexMarkets.com, 2003.
- 6 In 1999, the BBC reported that the U.K. had more surveillance cameras than any other country in the world and that the average citizen could expect to be captured on film every five minutes in metropolitan areas. Separately, also in 1999, the Financial Times reported that nationally, the average citizen was filmed by CCTV cameras 500 times a week.
- 7 Leisure Link is the U.K.'s largest provider of "pay to play" gaming machines, around 3000 of which are connected by broadband ADSL lines to the company's main servers; another 18,000 machines will be online with broadband connections over the next three years.
- 8 The World Wide Web was invented by Tim Berners Lee a few years before Mosaic.
- 9 Internet Software Consortium (www.isc.org), "Internet Domain Survey - Number of Internet Hosts," 2003. By the time Mosaic was first released in January 1993, the number of Net hosts had quadrupled to 1,313,000. The total number of connected host computers increased by one million from 1982 to 1992 (the 10 years before Mosaic) and grew by 170 million in the 10 years after Mosaic.
- 10 META Group, Inc., U.S. study, 2003.
- 11 International Telecommunication Union and CIA World Factbook, 2002, published in CyberAtlas.
- 12 IDG estimated that 31 billion e-mails are being sent every day, "Worldwide E-mail Usage Forecast, 2002-2006: Know What's Coming Your Way," 2002.
- 13 META Group, Inc., U.S. study, 2003.
- 14 Joint studies conducted by Survey.com for Forbes.com and Gartner G2 in 2003 interviewed more than 2,800 respondents, including 1,721 presidents, CEOs and board members, 236 vice presidents and 154 other C-level executives.
- 15 AOL Digital Market Services, 2002.
- 16 AOL/RoperASW study, 2003.
- 17 Cyberatlas, 2003.
- 18 Pew Internet Project, "Counting on the Internet," 2003. A separate Forrester Research report in 2001, "When Web Content Becomes Critical (Consumers' Channel Preference By Type Of Content," found that the Web was the primary source of information for U.S. consumers, preferred to every other channel from 'word of mouth' to TV, print and radio.
- 19 rate, a sharp analysis of how it has almost become an urban legend can be found at shirky.com/writings/half_the_world.html. According to Shirky, the phrase can be traced back to Thabo Mbeki's speech at the Information Society and Development Conference in 1996, but has since turned up in numerous speeches and reports – including this one! – in essentially the same form and usually without attribution. He goes on to prove that the updated statistic should be: "around two-thirds and still rising").
- 20 Manuel Castells, "The Internet Galaxy," 2001.
- 21 NUA, 2003.
- 22 Jupiter Research, 2003.
- 23 Havas and London Business School, "Marketing Expenditure Trends," 2003 (www.london.edu/marketing). Based on a survey of more than 700 companies in top five global markets: the U.K., U.S., Japan, Germany and France.
- 24 Nielsen/NetRatings, 2002.
- 25 CNET, 2003.
- 26 Spiked-Online conference, "Gone to the blogs: the blogging phenomenon in perspective," 2003.
- 27 The 2003 Spiked-Online conference, "Gone to the blogs: the blogging phenomenon in perspective," estimated between 500,000 and two million blogs worldwide (although some estimates go as high as three million).
- 28 Consumer Electronics Association (63 percent household penetration for TVs from 1947 to 1955) and Forrester Research (57 percent Internet household penetration).
- 29 Nielsen/NetRatings calculates that 29 million U.K. people have Internet access in 2003, while the CIA World Factbook reports 34.3 million; either way this represents around 50 percent of the 59.2 million people that, according to U.K. National Statistics, make up the total population.
- 30 European Commission, "eEurope Benchmarking Report", 2002.
- 31 Nielsen/NetRatings, 2003: more than 42 million U.S. office workers had access to the Internet from work in June 2002, a 23 percent increase over the previous year.
- 32 Online Publishers Association / Millward Brown IntelliQuest, "Media Consumption Study," 2001.
- 33 Short-range wireless (WiFi) networking is also making it cheaper and easier to access the Internet from any location. WiFi is expected to be in all new laptops within 12 months (Strategic News Service, 2002) and by 2008 it's predicted that there will be over 75 million users of over 167,000 public WiFi 'hotspot' locations (Gartner, 2003). Meanwhile, about three million U.S. households (about 6 percent of the total) have home networks, but researchers estimate that the market is growing at more than 40 percent a year (Financial Times, 2003).
- 34 Smart Computing magazine, 2001.
- 35 BBC News, 2000.
- 36 Business Week Online, 2001.
- 37 The average volume in foreign exchange exceeds \$1.5 trillion per day according to Forex Markets.com, 2003.
- 38 In their November 2002 report, "State Control of The Internet in China," Amnesty International state that the number of Chinese domestic Internet users is doubling every six months and that experts believe it is likely to become the largest Internet market in the world within four years. The CIA World Fact Book confirms that China is the world's third largest Internet audience with an estimated 45.8 million users (according to the U.N., some sources think it is already the second largest).

They said ... What happened

- 1 United Nations Conference on Trade and Development, annual E-Commerce report, 2002.
- 2 International Labour Organization's "World Employment Report," 2001. (While I believe that the global inequality this statistic highlights is accu-

- 22 Zona Research survey, 1996.
- 23 IDC, 1998.
- 24 OneStat, 2002.
- 25 Goldman, Sachs & Co. survey, reported in Business Week, 2003.
- 26 IDC, reported in Business Week, 2003.
- 27 Forrester Research, "The Linux Tipping Point," 2003.
- 28 BBC News, 2003.
- 29 Financial Times, 2003.
- 30 Brightmail Probe Network, 2003.
- 31 The Economist, quoting consulting company Ferris Research, 2003.
- 32 Reported in Business Week, 2003.
- 33 Webmergers, End of Year Report, 2002.
- 34 Forrester Research, "Global Online Trade Will Climb To 18 percent Of Sales," December 26, 2001.
- 35 Forrester Research, "The Internet Tax Man Cometh — Who cares?," February 7, 2003.

01 Economy

- 1 The words 'old' and 'new' are constantly used as part of an ongoing debate between progressive Modernity and past-its sell by-date Conservatism. A perfect example is the British Labour Party's triumphant re-invention as 'New Labour', simultaneously branding their Conservative opposition as being forever out of touch with the needs of modern society.
- 2 David Brookes, "Bobos in Paradise," 2001.
- 3 U.S. Department of Labor, Bureau of Labor Statistics, 2003.
- 4 Manuel Castells, "The Internet Galaxy," 2001.
- 5 Paul Bairoch, "Cities and Economic Development," University of Chicago Press, 1991.
- 6 Percentage of agriculturists in modern advanced societies: "The Economist Pocket World in Figures," 2002 edition (U.K. two percent, U.S. three percent).
- 7 "Does the New Economy Need All the Old IPR Institutions?" by Paul A. David, published in the World Institute for Development Economics Research (WIDER) newsletter "Angle," 2002.
- 8 Professor Robert H. Frank, "Luxury Fever: Why Money Fails to Satisfy in an Era of Excess," 1999.

02 Globalisation

- 1 OECD 2001, "The World Economy: A Millennial Perspective".
- 2 It's well known that the offshore call centre and technology services industry is booming in India; for example the International Herald Tribune recently quoted a Gartner research estimate that one out of every 10 U.S. computer services and software jobs could shift to lower-cost emerging markets such as India or Russia by the end of 2004. However the point I'm making refers to the concentration of intellectual capital relating to technology innovation.
- 3 Forrester, "Strategies for Global Sites," 2000.
- 4 Global Reach consulting, www.glreach.com/globstats (63.5 percent of current Internet users are not native English speakers and their number is growing rapidly).

03 People

- 1 IDC, "US Internet Demographic Forecast, 2003-2007: The Web's Future Is Still Bright - Use Sunscreen," 2003.
- 2 Colliers CRE Commercial Research, "Midsummer Retail Report," 2003.
- 3 In 2002, the Pew Internet Project and Jupiter Research separately reported that e-mail was the top online activity.

- 4 "How Much Information?" produced by the School of Information Management and Systems at the University of California at Berkeley, 2003.
- 5 Forrester Research, "This Is Not Your Teenager's Instant Messaging," February 2003.
- 6 Gartner estimates that 134.6 billion text messages will be sent in Western Europe this year with usage growing 34.8 percent in 2002 and 29.7 percent in 2003; SMS revenue grew 50.3 percent in 2002 and 34.2 percent in 2003. Forrester predicts that data will make up nearly half the average revenue per user (ARPU) for European mobile operators by 2005.
- 7 Pew Internet Project, 2002; Jupiter research, 2002.
- 8 Pew Internet Project, 2002; Jupiter research, 2002.
- 9 The Dieringer Research Group, "American Interactive Consumer Survey," 2003.
- 10 Business Week, 2003.
- 11 comScore/Online Publishers Association research, 2003
- 12 Forrester Research, 2001.
- 13 University of Sussex and The London School of Economics, "The Reality of E-commerce with Developing Countries," 2003.
- 14 Association for Payment Clearing Services (APACS), "Payments Markets Briefing," 2002.
- 15 E.g. Kazaa, Gnutella, Morpheus, Freenet; CyberAtlas reported that six of the leading file-sharing applications were used by 14 million North American consumers in September 2002.
- 16 ISPs say that music, movies and software files now make up as much as 60 percent of network data traffic, Reuters, 2003. The SETI@home project, linking hundreds and thousands of PCs across the net to harness any unused computing power in the search for extraterrestrial intelligence, is a foretaste of how computing resources such as hard disk space, bandwidth, memory and processing power will also be shared in the future (on more wireless devices).
- 17 The personal nature of the medium was brilliantly encapsulated in influential Net text, The Cluetrain Manifesto by Rick Levine, Christopher Locke, Doc Searls and David Weinberger, 2000. Although the following excerpt was a quote of a quote from the Web page "Taunt for Internet Advertisers" by @Man: "When you think of the Internet, don't think of Mack trucks full of widgets destined for distributorships, whizzing by countless billboards. Think of a table for two."

04 Information

- 1 Computer Business Review, 2003.
- 2 "Shrouds of Time – the History of RFID," The Association of Automatic Identification and Data Capture Technologies, 2001.
- 3 "RFID – a week-long survey on the technology and its potential," Interaction Design Institute Ivrea, 2002.
- 4 The Guardian, 2003; Analysts Sanford C. Bernstein & Co. estimate that by 2007 Wal-Mart could boost earnings by 38 percent using RFID; Business Week, 2003.
- 5 Lyman and Varian, University of California, Berkeley study, 2000.
- 6 IDG estimated that 31 billion e-mails are being sent every day in their report: "Worldwide E-mail Usage Forecast, 2002-2006: Know What's Coming Your Way," 2002.
- 7 In his paper "From Data to Wisdom," systems theorist Professor Russell Ackoff described a hierarchy of content in the human mind: data is followed by information, then knowledge, leading to understanding and ultimately wisdom.
- 8 Pew Internet and American Life, 2003.

04 Information

- From an address by Professor Leonard Waverman, Director of the Economic & Social Research Council's e-Society Programme, at the programme's launch in 2003. A study by Deloitte & Touche reported that 66 percent of U.S. patients did not receive any literature about their or their child's condition (and only one-third received information about their medication). This helps explain why people are turning to the Web for the medical information they simply can't get from traditional sources. Plunkett Research, Ltd., 2003.
- "The UCLA Internet Report - Surveying the Digital Future," written by the Center for Communication Policy at the University of California, Los Angeles in 2002, found that only 52.8 percent of Net users found most or all of the information online to be reliable and accurate in 2002, down from 58 percent in 2001 and 55 percent in 2000. And according to InternetNews.com, the study's authors expect this trend to continue.
- As Kevin Kelly, Wired Magazine's co-founder and Editor-At-Large, says: "A brand is an attention-management device in a world of exploding choices and opportunities."
- More recently, when asked to produce a weapons report by the U.N., Iraq did exactly the same thing by handing over an 11,807 page document, in English and Arabic, plus CD-ROMs (Source: ABC News, 2002).
- OECD briefing note, "Education at a Glance 2003," Organisation for Economic Co-operation and Development, 2003. (Data was not available for all OECD countries).
- Yankelovich research, 1982; Gallup research, 2002 – quoted in a testimony by Craig Barrett, CEO of Intel Corporation House to the House Committee on Financial Services in 2003.

05 Society

- Data from the Institute for Democracy and Electoral Assistance, www.idea.int/vt, 2003, shows that throughout the 20th century, voter turnout in the U.S. dropped fairly steadily to nearly 50 percent at the 2000 presidential elections and below 50 percent in the 2000 congressional elections. Calculating the number of votes divided by the voting age population (expressed as a percentage) we can see an average decrease of over 8 percent in U.K., France, Germany, Sweden, Italy, Canada and Japan between 1945 and 2001.
- The Economist, 2002. Less than six out of 10 eligible voters turned out in total (59.2 percent) and less than four out of ten 18 to 24 year olds.
- According to Sean O'Curneen, "Democratic Disaffection in the Future European Union," O'Curneen Cañas – Almadreams Ltd., 2002, data from Austria, Britain, Denmark, Finland, Germany, Iceland, Italy, Norway and Sweden shows a "stark picture" of decline in confidence in politicians (Putnam, Pharr, and Dalton, 2000). More recent data shows that political trust in Britain has halved since 1990 (Bromley, Curtice, and Seyd, 2001). The bi-annual Eurobarometer surveys show that the EU-15 average level of distrust in national government was 43 percent and 38 percent for national parliament in 1995. This increased by spring 1999 to 49 percent and 46 percent respectively, and again two years later to 51 percent and 46 percent, showing a clear decline in trust for political institutions throughout European democracies in the late 1990s.
- No pun intended. Professor Freeman at the London School of Economics is researching innovative uses of Internet technology by trade unions for his e-Society project, "How are Job Markets and Unions being changed by the Internet?" One example is the Working Families e-Activist Network, www.unionvoice.org/wfean, a mass e-mail list which mobilises subscribers to send a fax or e-mail to "key decision makers in Congress, at the White

House or an employer who isn't respecting the rights of workers." This worked very successfully in the Enron case where the bankruptcy judge received thousands of e-mail petitions for Enron workers (usually bottom of any creditors list) to receive higher severance payouts.

- PriceWaterhouseCoopers, 2003; American Management Association, "Workplace Monitoring & Surveillance Survey," 2000.
- U.K. Office for National Statistics, 2003; U.S. Dept. of Health and Human Services, National Center for Health Statistics, 2001.
- Where Henry Ford once limited the colour range of his automobiles to black, today's car buyer is more likely to be asked in which particular paisley trim they'd like their dashboard upholstered. The degree of choice offered to modern consumers is unprecedented. For example, Sony's Press office says that in the U.K. alone they released 45 different models of Walkman in 2002; there are an estimated 170 different models on offer worldwide today.
- Forrester Research, "This Is Not Your Teenager's Instant Messaging," February 2003.
- Buddy Lists are a combination of e-mail "nicknames" and speed-dial numbers in a mobile phone. According to a 2002 iSociety report, 68 percent of
- Swedish households own a PC, although in 2003 Forrester Research report a figure as high as 76 percent. The 2002 CIA World Factbook calculates the total population at 8.9 million people, 6.02 million (or around 70 percent) of which Nielsen/NetRatings say have home Internet access; in 2003 Forrester Research estimate that 66 percent of Swedes are online from home.
- According to Gartner G2 figures, in 2003, 64 percent of all households in the U.S. own at least one PC (about 25 percent own more than one). The 2002 UCLA Internet Report, created by the Center for Communication Policy at the University of California, identified U.S. home Internet usage at 59.3 percent of the population.
- iSociety reported that 54 percent of U.K. households owned a PC at the beginning of 2003. According to the National Statistics Omnibus Survey, "Access to Internet from Home," 48 percent of households in the U.K. (12 million) could access the Internet from home in the second quarter of 2003. Separately, Nielsen/NetRatings calculates that 29 million UK people currently have Internet access, while the CIA World Factbook reports 34.3 million; either way this gets to the same figure, around 50 percent of the 59.2 million people (UK National Statistics) that make up the total population. Pew Internet Project, "The Ever-Shifting Internet Population," 2003.

06 Marketing

- E-search, "Using Discounts to Build A Customer Base," 1999.
- Another example was the free, Web-based e-mail service Hotmail, credited with introducing the term 'viral' to the Web's marketing vocabulary. Besides their infectious proposition itself (free e-mail), the service spread like wildfire by creating a 'viral' footer for each e-mail sent which invited the recipient to sign-up via a link to the Hotmail Website. The company was soon snapped up by Microsoft for \$28 million and today claims, with 110 million members sending 2 billion messages each day (source: CNN, 2003), to be the most popular free, Web-based e-mail service in the world. Microsoft, 2003.
- In a 2002 poll by Gartner G2, 49 percent of respondents were highly irritated by banners and 78.3 percent by pop-ups; Also in 2002, Jupiter Research MMXI found that 80 percent of online adult users voted pop-ups the number one annoying form of online advertising.
- BBC News, 2003; MessageLabs, 2003.

- 5 Google itself claims that its targeted advertising program is the largest and fastest-growing in the industry. In May 2003 Google moved up from 5th to 3rd place in the Media Power 50, an annual review of the most powerful business-to-business advertising outlets conducted by B-to-B magazine in the U.S. This ranking recognised Google as one of the most influential properties for business-to-business marketers among all print, broadcast, online and outdoor media.
- 6 Havas and London Business School, "Marketing Expenditure Trends," 2003.
- 7 A 2002 study from the Pew Internet Project showed that Americans are consulting the Net for all major life events except divorce.
- 8 Cyber Atlas, 2003.
- 9 Nielsen/NetRatings, 2002.
- 10 Analysis by British Airways and Agency.com based on post-impression data: includes affiliate marketing, search engine optimisation and format advertising activities.
- 11 China (45.8m) and Japan (56m) figures sourced from CIA's World Factbook, 2002; (the U.N. reports that some sources estimate China has now overtaken Japan to claim the No.2 spot). According to J.Walter Thompson in China, reported by research group The Henley Centre, there are at least 100 million affluent Chinese with enough disposable income to indulge in a wide range of non-essential goods, from soft drinks to home furnishings.
- 12 VnUNET.com reported that 10 million of South Korea's 14 million households had broadband connections in January, 2003; this year Datamonitor calculated that there were a total of 10 million European broadband households in 2002.
- 13 Jupiter Research, 2001.
- 14 Morgan Stanley predicts 2.5 percent global GDP growth for 2003.
- 15 According to Profesor Freeman at the London School of Economics, from research into his e-Society project "How are Job Markets and Unions being changed by the Internet?", 27 percent of US workers with PC and Internet access work at home and of this, an average of seven hours per week is unpaid. In other words, their employers don't consider these extra working hours (probably evenings or weekends) as paid overtime, but part of the normal workload covered by an individual's salary. None of these additional hours are currently counted in any government statistics.
- 16 Online Publishing Association/Millward Brown IntelliQuest, Media Consumption Study, 2001.
- 17 U.S. Department of Commerce, 2002.
- 18 eMarketer/The Wall Street Journal, 2003.
- 19 Cyberatlas, 2001; Pew Internet Project, "E-mail at Work," 2002.
- 20 Online Publishing Association/Millward Brown IntelliQuest, Media Consumption Study, 2001. Additionally, research by Profesor Freeman at the London School of Economics for his e-Society project, "How are Job Markets and Unions being changed by the Internet?" found that U.S., U.K. and Canadian workers spend 2.5 hours every week online at work for personal reasons.
- 3 Booz Allen Hamilton was commissioned by the U.K. government's office of the e-Envoy, in collaboration with Insead Business School, to study the online economies of G7 countries plus Australia and Sweden, "International e-Economy Benchmarking - The World's Most Effective policies for the e-Economy." 2002. Among their many findings was the fact that Britain has the lowest proportion of citizens actually using online government services: 11 percent.
- 4 An international survey by Accenture, 2001 and 2002.
- 5 News item in a New York newspaper, 1868. As it happens, telephones are a fine example of how extensive human-factor engineering eventually created one of the most user-friendly modern appliances. According to Britannica.com, usability considerations in the design of the push-button telephone included the legibility of keypad numbers and letters, and the sizes, spacing and tactile "feel" of the buttons. Plus handset weight and the optimum "locations, separations, and angles between the earpiece and mouthpiece" were determined so that the assembly would fit comfortably around the greatest number of different human faces.
- 6 The 2003 iSociety report, "Mobile U.K.: Mobile Phones and Everyday Life," also identified lower cost barriers, improved handset design and strong marketing campaigns as contributing to this tipping point.
- 7 Forrester Research, 2001. In 2000 the Financial Times reported that a quarter of 10,000 American parents surveyed said their child had started on the computer by age two.
- 8 UCLA "Internet Report - Year 3", 2002.
- 9 Yankee Group, "Will Wireless Carriers Have Success With Generation Y-erless?" 2000, referring to U.S. 10 to 19 year-olds.
- 10 OPA Executive Director Michael Zimbalist, quoted in MediaPost.com, 2003.
- 11 A 2003 Nielsen/NetRatings survey of eight European countries reported that 13.1 million kids are online in Europe, growing by 30 percent from 10 million a year ago (the U.K. now has the highest proportion of European children online).
- 12 According to the Yankee Group in their 2000 report "Will Wireless Carriers Have Success With Generation Y-erless?" children and teens are set to become America's largest age-defined market segment by the end of this decade. And a recent online study from Harris Interactive in 2003 pegged the annual income of the 57 million U.S. kids between the ages of eight and 21 at \$211 billion and says they spend \$172 billion per year. Of this, the 2002 report, "Marketing to the Internet Generation: Development to 2005," by SMI Publishing, forecasted that more than \$14 billion will be spent online in 2004 by the 86 million two to 23 year-olds in the 'Internet Generation'.
- 13 The 2002 study, conducted by usability specialists the Nielsen Norman Group, was based on testing with 55 children in the U.S. and Israel aged between five and 10. The children were observed interacting with 24 sites designed for children and three mainstream Web sites designed for adult users (Source: CyberAtlas.com, 2002).
- 14 Recent qualitative research from Professor Sonia Livingstone's project "Children Go Online: Emerging Opportunities and Dangers", part of the U.K.'s "e-Society" programme, concluded that children are newly appreciated as household Internet experts: "... both girls and boys gain significant, perhaps even unprecedented, social status and domestic power through the value that adults place on this expertise." In addition, children's high-tech know-how is helped by their willingness to continually experiment online. Adults may find it impossible to catch-up; while kids are constantly learning by doing, their parents are asking: "where's the manual?"

07 Usability

- 1 What's more, when we try to complain, we're usually abandoned in auto-response hell, neatly summed up by American humourist Alice Khan: "For a list of all the ways technology has failed to improve the quality of life, please press three." Eventually, we might actually get to speak to another human being in a call centre, what Manuel Castells has called the new "electronic communications factories" of the online economy.
- 2 Forrester Research, "Why Online Banking Users Give Up," 2002.

08 Freedom

- 1 Forrester Research, "Winning The Changing Financial Consumer," 2003.
- 2 Forrester Research, "Retailers Must Secure Online Buyer Privacy," 2002.
- 3 In 2002 Amnesty International named 33 companies, including Microsoft, Sun Microsystems, Nortel Networks and Cisco Systems that it claimed were selling censorship technology to the Chinese.
- 4 Amnesty International, "People's Republic of China – State Control of the Internet in China," 2002.
- 5 007 aficionados may remember the classic espionage euphemism of being in the 'import/export' business.
- 6 According to Shanthi Kalathil and Taylor C. Boas in "Open Networks, Closed Regimes: The Impact of the Internet on Authoritarian Rule," Carnegie Endowment for International Peace, 2003, the Internet-technology industry itself was the fastest growing sector of the Chinese economy between 1996 to 2000.
- 7 According to Amnesty International, which is in China, already the third largest and fastest-growing online nation – there are predictions of 300 million networked devices, from mobile phones to PCs, within the next five years (Shanthi Kalathil and Taylor C. Boas in "Open Networks, Closed Regimes: The Impact of the Internet on Authoritarian Rule," Carnegie Endowment for International Peace, 2003.
- 8 For example, according to Jason Lacharite's report "Electronic Decentralisation in China: A Critical Analysis of Internet Filtering Policies in the People's Republic of China," Australian Journal of Political Science, 2002, it is still possible to bypass CCP surveillance by using anonymous e-mail services and a combination of counter-filtering techniques, plus the ability to dial directly into foreign ISPs. While there's no doubt that it's a lot easier to crack down on known dissidents (Kalathil and Boas report that the Falun Gong have been forced to communicate by public payphones within China as it is less traceable than e-mail - although international members still actively use the net to rally support for their cause) unless authorities know who they are looking for, scanning billions of e-mails to detect and identify subversive groups that might 'jeopardise state security and disrupt social stability' is like trying to hunt the proverbial haystack-hidden needle.
- 9 The big risk is that national identity cards, almost certain to be introduced in the U.K. within the next few years, could become the cornerstone of such a database. According to The Economist, 2003, new European Union passports are likely to include biometric data such as retinal scans or fingerprints from 2005.
- 10 Getting people to submit details of their identities to fraudulent sites is known as "phishing." A recent spate of such frauds in the U.K. have successfully masqueraded as high street financial brands such as Barclays, Lloyds TSB, NatWest, Halifax and Nationwide.
- 11 In fact, we're particularly careless about protecting personal details online. According to Gartner G2, "Privacy and Security: On a Continuum or a Collision Course?" 2002, nearly 60 percent of online American adults use the same ID and password as often as they can; just 13 percent say they change them frequently.
- 12 The Economist, 2001.
- 13 Federal Trade Commission Identity Theft Program, 2003. According to the Experian credit reference agency (reported on theregister.co.uk, 2003), U.K. identity theft also doubled in 2002.
- 14 In 2001 the IMF estimated that money laundering is worth between \$600 billion and \$1.5 trillion per year – two to five percent of global GDP – destabilising world stock markets and currency movements.

09 Content

- 1 Although there's evidence that innovations like broadband also reciprocate by stimulating a greater demand for content and make consumers more likely to pay for it. A 2003 Jupiter Research survey of 851 Australian users found that broadband users were on average 60 percent more likely than narrowband subscribers to pay for content across a variety of categories from music and videos to business and financial news. Separately, a 2003 study by AccuStream iMedia Research confirmed that broadband access goes hand in hand with the consumption of richer media content such as streaming audio and video: nearly six in 10 people (59 percent) with broadband Net access watch or listen online compared with 47 percent of those with dial-up connections.
- 2 Made in an e-mail exchange with Lawrence Lessig, quoted in "The Future of Ideas – The Fate of the Commons in a Connected World," 2003.
- 3 Allyson Liebman, "Sagging Warner Music out of Tune with AOL TW", New York Post, 2001; Charles Mann, "The Heavenly Jukebox," Atlantic Monthly, 2000 – both referenced in Lawrence Lessig's "The Future of Ideas – The Fate of the Commons in a Connected World," 2003.
- 4 "Does the New Economy Need All the Old IPR Institutions?" by Paul A. David, published in the World Institute for Development Economics Research newsletter "Angle," 2002.
- 5 According to Lessig, in the first 150 years of copyright law, U.S. Congress twice retrospectively extended the term of copyright protection to a work already created, but this has happened 11 times in the last 40 years. In theory, this postponement could continue indefinitely, effectively keeping valuable content from ever entering the public domain.
- 6 Copyright law was originally created to balance the need to incentivise the production of new ideas (by protecting the rights of creators to sell what they invented) with the objective of eventually making these ideas accessible to all by limiting the term and rights (such as 'fair use') of this protection.
- 7 For instance, much of this chapter's content stands squarely on the shoulders of Lawrence Lessig's "The Future of Ideas – The Fate of the Commons in a Connected World," 2003. But another illustration of how those with psychological ties to the status quo can fail to recognise fresh possibilities is Canadian media guru Marshall McLuhan's observation that: "the content of a new medium is always an old medium;" e.g. for a long time the majority of entertainment content on commercial U.S. TV was film.
- 8 While many businesses are well on the way to making their profits from selling services rather than the products they come packaged with, the music industry seems uninterested in exploring alternative ways to make money from its copyrights. Even a solution like Digital Rights Management software, for instance, is trying to make bits behave like atoms by limiting the storage and distribution of digital information goods. It's left to technology companies like Apple and their iTunes Music Store to re-think existing models of production and distribution and make it easier to buy music online than to steal it. Meanwhile, ringtones downloaded to mobile phones are now already generating more profit and larger sales than CD singles and account for seven percent of total music royalties in Japan. Artist Sean Paul recently sold more copies of a downloadable digitised song snippet than the CD single according to Warner Music Group, International Herald Tribune, 2003. And BBC News reported that ringtone sales are more profitable to record companies than singles and are expected to rise 60 percent this year, according to the Mobile Data Association (MDA). Universal Music Company said that they made a larger profit margin on ringtone sales of the recent Sugababes hit Round Round than the CD single.

9 Hollywood's 2002 box office take of \$8.1 billion was \$1 billion less than Computer and Video games industry revenues in the same year. These days games even have their own multi-million dollar virtual product placement deals: sponsors include brands like Intel and McDonalds in Electronic Arts' "Sims Online" and Nokia in Activision's "Kelly Slater's Pro Surfer," New York Times, Internetnews.com, 2003.

10 Entertainment Software Association, 2002.

11 Electronic Arts, reported on Internetnews.com, 2002. (In-Stat estimated that online gaming accounted for 9 percent of U.S. network traffic last year).

12 Forget the stereotype of nerdy teenage boys glued to shoot-em-ups. According to an Entertainment Software Association survey, conducted by Peter D. Hart Research Associates, Inc. in 2003, 41.6 percent of computer gamers are over 35 and 41.9 percent of them are women.

13 In a report by Dr. Mark Davies and Professor Mark Griffiths, "Breaking the Stereotype: The Case of Online Gaming," Nottingham Trent University, 2003, 25 percent of people who play EverQuest do so for more than 41 hours a week and 15 percent play for more than 50 hours a week.

14 "Virtual Worlds: A First-Hand Account of Market and Society on the Cyberian Frontier," Edward Castronova, associate professor of economics at California State University at Fullerton, 2001.

10 Profit

1 The collapse of Enron in 2001 illustrates this point. Dozens of local Houston businesses from pizzerias to IT consultants were hit by bankruptcy and restructuring, Fortune Magazine, (2002) and 37 financial organisations around the world had Enron-related investments totalling at least \$4 billion, BBC News, 2002.

2 However, this is still very much a work-in-progress. According to iSociety in 2002, the British Department of Trade and Industry benchmarked the U.K. against the U.S., Canada, Japan, Germany, Sweden, Italy and France and found that on average only 37.5 percent of businesses order supplies online and around 15 percent accept invoices electronically (the U.S. is almost double these averages).

3 Autobytel.com refers potential car buyers to dealerships and now accounts for one in every \$20 dollars spent in U.S. new car purchases (Source: Plunkett Research, Ltd., 2003).

4 Online travel booking is among the most successful e-commerce models. In the U.S., for instance, Southwest Airlines now gets around 50 percent of all reservations direct on its site, bypassing travel agent commissions and reducing the cost of human reservation agents. According to Jupiter Media Matrix, the number of Americans booking their travel online increased by nearly 17 percent in 2001 to 17.8 million households (Source: Plunkett Research, Ltd., 2003).

5 The Web also allows consumers to directly influence each others' buying behaviours on sites like epinions.com which aggregate independent consumer reviews of over two million products and services.

6 British Telecom 2003 internal report on their 'BT Online' eBilling service. Customer satisfaction figures are from research company Sweeney Pinedo's 2003 study for BT covering a base of 680 online customers.

7 Momentum Research Group, Inc., "Net Impact 2003."

8 American Historical Review, April 2003.

9 Manual Castells, "The Internet Galaxy," 2001; Zara.com, 2003.

Revolution or Evolution

1 During the boom, boosters like the Federal Reserve (most notably its Chairman, Alan Greenspan) hailed technology as the saviour working America's unprecedented "productivity miracle," increasing output by \$70 billion per year from 1995 to 2000. Then the technology stocks crashed followed by the first American recession in a decade and the miracle figures were revised downwards.

2 The precise change in productivity was 0.92 percent which is significant in terms of potential economic impact nationally. For four quarters from the middle of the 2001 recession, U.S. productivity actually increased at a rate of 4.7 percent, "Productivity, IT and the New Economy" by Kevin J. Stiroh, a Research Officer at the Federal Reserve Bank of New York, published in the World Institute for Development Economics Research newsletter "Angle," 2002.

3 In their iSociety report, "Getting the Measure of the New Economy," 2002.

4 OECD, "Computer and Dynamo: The Modern Productivity Paradox in a Not-too-distant Mirror" by Paul David, 1991.

5 "The New Economy: Background Questions, Speculation," a working paper by Bradford DeLong and Lawrence Summers, extracted from iSociety report "Getting the Measure of the New Economy," by Diane Coyle and Danny Quah, 2002.

6 Intel, "Cost of Computer Power," extracted from "Hype and Reality in the New Economy" by Diana Coyle, 2003.

7 Research breakthroughs by HP and IBM cited by The Economist, "Survey: The Internet Society," 2003.

8 Ray Kurzweil, author and artificial intelligence pioneer, has been studying key measures of capacity and priceperformance in a wide variety of information-related technologies, from magnetic-disk memory density to DNA sequencing, for over 20 years. On KurzweilAI.net he asserts that the data clearly proves exponential growth that goes far beyond Moore's Law and brings the 'doubling time' down to 10.4 months.

9 For example, the labour market: according to Prof. Leonard Wavermam of the Economic and Social Research Council e-Society programme, 27 percent of online Americans now do some form of work from home and three-quarters of connected people seeking employment use the web.

10 MIT Technology Review, 2000.

11 Wall Street Journal, 2000. According to the Financial Times in 2001, IT represented the highest proportion of US business investment in 1999.

12 "Productivity, IT, and the New Economy" by Kevin J. Stiroh, Research Officer at the Federal Reserve Bank of New York, published in the World Institute for Development Economics Research newsletter "Angle", 2002. Compared to the previous two decades, the US economy gained 0.92 percent in extra productivity from 1995 to mid-2002; of this total increase, 32.5 percent was attributable to IT-production and 43.5 percent to IT-use.

13 In their 2002 iSociety report, "Getting the Measure of the New Economy," Diane Coyle and Danny Quah outline these "three stages in the unfolding of a new general purpose technology."

Please visit www.agency.com/10yearson to see more detailed references for selected sources.

About the author

Andy Hobsbawm was a founding director of leading British new media company Online Magic which merged with Agency.com in 1997. As European Chairman of Agency.com, Andy helps guide and is a spokesperson for the firm with his unique insight into the continual evolution of the interactive medium. He also oversees Agency.com's international go-to-market strategy and the development of interactive marketing and brand strategies for key clients.

He has spoken at numerous industry events including Forrester's Consumer Marketing Forum, the Jupiter ClickZ Advertising Conference and the Global Marketing Forum and has also helped to judge many award ceremonies such as the London Revolution awards and New York's One Show Interactive. Andy has been named one of the Top 50 Internet Professionals in the U.K. by Internet Business Magazine and U.K. "New Media Entrepreneur of the Year" by Campaign Magazine. In September 2004 Andy was voted by U.K. industry professionals and opinion formers as one of 100 individuals who have most influenced the development and growth of e-commerce and the Internet over the last 10 years. He received a Special Lifetime Achievement Award at the Net Imperatives Digital Awards in March 2005.

Andy was born and raised in London, and educated in London and Montreal. He was a weekly columnist about the new economy for the Financial Times and has yet to receive any royalties from obscure pop songs released by a minor independent record label in Europe. And he can still remember the thrill of seeing readers from around the world interact in real-time with his first Web site for online e-zine PowerPC News, following the release of Mosaic in 1993.

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This progress report on the state of the internet was written in December 2003, ten years after the first web browser Mosaic was released.

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