

Broadband

2006

2007

2008

2009

2010

the next 5 years

Stimulating the debate



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"We predict that over the next 20 years broadband will have a similar impact on the economy to that of the introduction of electricity from 1890 to 1920."

Douglas McWilliams, CEBR

"Learning through broadband is not something that is done to you, but is something that you do yourself."

Steve Hogger, DFES

"Mobiles, TVs and other electronic devices are all part of the solution."

Dr Sherrin Moss, BUPA

"Broadband will allow us to do more than enhance traditional models of learning and participation, it will allow us to create new models."

Gareth Mills, QCA

"The face of the high street is going to change considerably."

James Roper, IMRG

"What is the centre of the digital home? Is it going to be a set-top box, a TV, a PC?"

Adrian Criddle, Intel

"Broadband is a catalyst for innovation."

Antony Walker, Broadband Stakeholder Group

"Broadband results in smarter, more demanding shoppers who also spend more money."

Forrester Research

"Broadband is already at the heart of most businesses, and increasingly at the heart of many homes. Soon it will fade completely in the background and become invisible – integral to everyday life."

Dick Moore, UFI

"We'll probably all become content publishers and originators."

Nick Hazell, Yahoo

"One of the social benefits of broadband is a reduction in loneliness."

Ian Pearson, BT



In recent years, the debate about broadband has been dominated by a fixation with benchmarks – for availability, for reach, for a competitive market, for price. Those targets have been reached – more than seven million homes in the UK have DSL broadband, more than 99.6 per cent of homes have access to it, and the UK has the most thriving competitive broadband market in Europe, including more than two million cable broadband connections.

So where do we go from here? What does having broadband actually mean, to people, to business, to our society and our economy? We've worked hard to bring this technology to people, but why should they want it and what will they do with it – both now and in the future?

This report is about the opportunities that broadband brings. It's not a corporate vision, but an attempt to spark off the next stage of an important debate.

Within the report you will find the voices of many of the key players from across BT, from industry, from Government and from community groups. Some of the views we agree with, others we may not. But they all contribute to what needs to be a vibrant discussion on how to make this country's tremendous technology assets enable positive change in making people's lives more flexible and fulfilling, and to help deliver enduring economic benefit through more efficient businesses.

The report debates three basic questions: what are the opportunities broadband creates? What is getting in the way of these opportunities becoming reality? And what do we – collectively – have to do to shift those obstacles?

I would like to thank all those who took the time to contribute to this report and hope that the discussion will continue.

Ben Verwaayen

Chief Executive
BT Group plc

A BROADBAND WORLD

Contributors to this report have revealed wide and varied opinions of what a broadband world will look like in five years time. They say broadband has the potential to continue to revolutionise industries, to change organisations, to enhance our society and deliver environmental benefits.

When electricity was first harnessed its applications were basic. It took many years and people with vision to see that electricity could power an endless variety of appliances and change people's lives. While for many in today's society broadband is simply the power behind the internet, those with vision believe that broadband will become increasingly integrated into the fabric of life, in a similar way to many of the utilities we all rely on every day.

Given the pace of change in technological development, it's possible that we have not yet even imagined some of the developments we'll see in the broadband future of 2010. What is clear is that our experience of technology in the future will be profoundly shaped by the mass availability of broadband.

In 2010, the idea of being tied by a cable to any kind of fixed device will be a thing of the past and broadband will be with us in the home, at work and on the move. We will probably wear some of our communications devices rather than carry them, and all of the devices we own will talk to one another and share information. That's just the beginning.

In the broadband future, small businesses will be given the opportunity to compete on the same basis as large enterprises, with access to the same tools as their global competitors. Businesses will undergo a transformation in productivity, as significant – some believe – as the advent of electricity, with a major impact on both productivity and GDP. Innovators will build entirely new businesses and business models on broadband foundations, supporting the transformation of this country into a successful knowledge economy.

Education will no longer be bounded by the walls of a school. Some believe children will learn through an 'individual' education system that is tailored to their ability and needs – learning at their own speed with support from specialised applications. They will have access to specialist teachers and learning communities. Parents will help with their homework and review their progress through the child's online learning space. Exams will be taken as each child is ready, with most exams both taken and assessed online.

A TRANSFORMATIONAL TECHNOLOGY

The administrative backbone of our healthcare system will, for the very first time, join up the entire country. A growing proportion of diagnoses and advice will be distributed by video technology, easing the burden on GPs and overall waiting lists.

Broadband-delivered information will help create a healthier and more informed population. Elderly people and those with chronic illnesses will be able to live at home for longer due to the protective influence of broadband-enabled monitoring systems.

The balance of power in the entertainment and media industries will shift considerably. Devices will converge and so will companies. The consumer will be in control of their entertainment and media content – what, when and where they want.

The concept of 'remote control' will take on a new meaning. Advertisers will have to rethink their strategies. The citizen publisher will help shape the future of entertainment, and there will be a vast array of niche and community content. All of the devices in the home will be broadband enabled and the digital home, where entertainment devices talk to one another through the home network, will become a reality for the mass market.

Online shopping will boom as it continues to deliver key consumer drivers of value, information and choice. Broadband wireless networks in store will rapidly change the retail environment through innovations like digital pricing and customer service video-conferencing. Ultimately, the face of the high street will change forever. Those stores that survive will sell an 'experience' – for everything else, online will deliver.

Social and family networks will be strengthened by the ease and cheapness of communication. Families with elderly or distant relatives will have constant reassurance of their safety through home-monitoring networks. Communities will grow together through their own broadband networks.

This is a vision that is both achievable and enticing – but how do we make it a reality?

THE OBSTACLES & HOW WE ADDRESS THEM

This broadband future will not miraculously materialise without some effort on the part of society, industry and government. Policy makers, think tanks, opinion formers and regulators have a part to play as well. There are many significant obstacles that have the potential to prevent this vision becoming reality.

The biggest challenge is the human challenge. While many of us involved in the communications sector take the enormous value of broadband for granted, a large proportion of society are yet to understand the many benefits this technology can deliver

in their personal and professional lives. In fact, many don't see the need for it at all. Even some of those who have broadband appreciate only a small proportion of its true potential.

For society and our economy, for UK plc to benefit fully from what broadband can deliver, we need to bring about a fundamental change in attitude and appreciation. It is not enough to make broadband available. If people don't see the need to use it, cannot use it effectively or fail to comprehend its potential for transformation – much like having a car and not being able to drive – the benefits will be diminished.

Education is vital – broadband creates immense possibilities that can only be realised if people understand how to access them. This 'education' process must extend far beyond schools – for businesses, for adults, for teachers, for community organisations.

Broadband needs to be brought alive for the man in the street. To really create engagement with those who are currently indifferent, it needs to be built into compelling products and services that make a difference to their daily lives. These services need to be built above and beyond the PC to engage with those who will never own one – through the television or the telephone, or even the fridge.

Many people are put off by the complexity of the technologies in our daily lives, and the growing number of devices we carry. Consumers need simplicity and interfaces that are intuitive to use and easy to fix and devices that talk to one another.

This report also finds that not enough is being done to take advantage of the business opportunities offered by broadband. Despite a favourable infrastructure for e-commerce, not enough businesses are investing, nor are enough businesses sufficiently equipped, to exploit fully the benefits of broadband.

The business infrastructure in this country needs to be supportive and provide the same opportunities in terms of tax breaks and incentives to support the new business models that broadband generates as are afforded to traditional industries.

The regulatory system also needs to continue to reflect the evolving challenge of a new, growing and constantly changing competitive marketplace. Creating a business environment that encourages the development of applications and services built on broadband's transformative potential is vital. Without adequate protection for the creators of new content and ideas, the motivation to create is destroyed. And without the creation of compelling content and services, broadband has only limited value.

While public services are often hailed as potentially the biggest beneficiaries of the broadband future, no-one should underestimate the huge shift in culture and infrastructure that will be required for broadband to become a cornerstone of public-service delivery. This will require a strategic change management process and sustainable investments to ensure not only that access

to public services can be online, but also that broadband is built into the delivery of those services to the maximum benefit of the end user.

STEPPING UP TO THE CHALLENGE

Those responsible for developing the infrastructure, like BT, have their own set of responsibilities. They need to invest to deliver increasing bandwidth at the right price.

Businesses need to create a role for themselves in this broadband future that will deliver value not just to customers but also to shareholders.

Finally, sustainability needs to be a key concern in developing this broadband future. It is important to ensure that the environmental benefits are embraced and any negatives are managed or mitigated.

These are just some of the things that need to happen for the vision of a broadband future, which generates so much excitement and enthusiasm amongst our commentators, to become a reality. This report aims to clearly identify the obstacles to achieving the vision of a broadband future, and start a discussion about how we may address them.

You can also add your voice to the debate by visiting www.bt.com/broadbandthefuture

METHODOLOGY

This report was researched and compiled by Catalysis Communications, an independent communications consultancy. Catalysis carried out interviews with representatives of over 70 organisations and institutions across the UK during late 2005 and early 2006. All contributors represent organisations with an expressed interest in the long term development of broadband in the UK.

Contributors include public sector bodies, commercial businesses, industry commentators and BT executives. The report is not designed to promote the specific services offered by any of the contributors but to assemble the broadest view possible on the opportunities and barriers to broadband development over the next five years. The report was commissioned by BT.



“While for many broadband is simply the power behind the internet, those with vision believe that broadband will become increasingly integrated into the fabric of life.”

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STIMULATING THE DEBATE

- Broadband can drive improvements in productivity with a significant impact on GDP
- Business innovators will build entirely new business models based on broadband and VoIP
- Globalisation will increase with mass-market broadband, and global markets will be open to businesses of all sizes
- Too few businesses understand the benefits of broadband – education and awareness raising is vital
- Broad-based education systems needs to be able to supply people with the skills to exploit broadband for business success
- Regulation needs to provide protection for innovators while respecting the rights of 'digital citizens'.

*These are some of our contributors' views
– What do you think? Feedback at:
www.bt.com/broadbandthefuture*



BUSINESS



A recent DTI International Benchmarking Study¹ shows that UK businesses are now amongst the most sophisticated users of information and communications technology (ICT) in the world, with 69 per cent of UK businesses now using broadband. Impressive statistics, but what does this mean for these businesses? Are they seeing significant benefits from broadband access?

There is little doubt that for those who have broadband, business has changed for the better. In a survey of its members conducted by the Institute of Directors (IoD) in 2004², 84 per cent said they had seen improvements in productivity since installing broadband and 61 per cent said that it has delivered cost savings. In all, 64 per cent reported a direct link between broadband and increased profits. According to the IoD, "Broadband has established itself as an indispensable part of our business infrastructure. It is difficult to think of a comparable recent development in business equipment or techniques that has been so widely identified as a positive factor in terms of business performance."

So what next? What does the broadband future look like for Britain's businesses and what obstacles, if any, could prevent further benefits being reaped from broadband?

A TRANSFORMATION OF THE MARKET

Firstly, ubiquitous broadband will transform the productivity of the UK in the broadband future. It will raise UK economic productivity by 2.4 per cent and GDP by £22 billion by 2015, according to the Centre for Economics and Business Research (CEBR)³. This is a significant shift. Douglas McWilliams, Chief Executive of Centre for Economics and Business Research (CEBR), says: "We predict that over the next 20 years broadband will have a similar impact on the economy to that of the introduction of electricity from 1890 to 1920."

Productivity benefits may not seem hugely ground-breaking, but consultants McKinsey emphasise the vastness of this impact: "To those who still think we are making excessive claims for what is basically a faster way to do things we can already do, we would say that a car is just a faster version of a horse and carriage, and a computer merely a faster calculator. If broadband applications have just a fraction of the impact of either of these, they will indeed change everything."⁴

Commentators also agree that broadband will underpin the creation of significant wealth in the UK economy, through its role in both enabling the online marketplace and supporting a knowledge-driven economy. The Future Foundation estimates that 20 per cent of transactions in retail will happen online by 2010, a significant proportion of the marketplace, worth some £60 billion a year⁵. The European Interactive Advertising Association also predicts that advertising spending on the internet will account for seven per cent of total advertising spend by 2008⁶.

James Brathwaite, Chairman of the South East England Development Agency (SEEDA), says: "We need productivity drivers within the economy. Broadband will continue to be a key driver of wealth creation."

Beyond the productivity gains, many believe that broadband's transformational power will change the face of British business irrevocably. "Broadband is a catalyst for innovation" says Antony Walker, CEO of the Broadband Stakeholder Group (BSG). "It will create new business models, cause a shift in existing business models and thus change the business landscape significantly."

Walker cites the internet-telephony business Skype, recently acquired by eBay for \$2.6bn, as an example of a new business built on a broadband infrastructure. This shift to new business models will be so seismic that Deloitte predicts a \$1 trillion movement in valuations across converging industries like telecoms, broadcast and the creative industries by 2010⁷.

The pace of change is so fast that eBay Chief Executive Meg Whitman says that half of the internet giants 10 years from now may well be companies of which we have not yet heard⁸.

GLOBAL COMPETITIVENESS

Ubiquitous broadband offers British businesses access to vast opportunities for global trade and commerce. The DTI says that globalisation is a long-standing trend but the rapid deployment and "take-up of broadband around the world has accelerated this process, leading to the outsourcing of business service and process operations."⁹

Broadband will give even small businesses a chance to trade with global players, and even compete with them, on a level-playing field. Matt Bross, Chief Technology Officer at BT, says: "Broadband at its essence delivers the possibility of a common language across vast geographic boundaries. Internet protocol is a great equaliser – it unlocks the potential for effective global communication for everyone."

James Murfin, Hosting Channel Development Lead at Microsoft Hosted Services, believes this will be a key trend for the next five years. "For over 20 years we've been providing business tools to the big enterprises. Over the next few years, broadband will allow more and more small businesses access to the same services, allowing them to compete on a more even footing with bigger competitors – a huge development." James looks at this trend in more detail in his article on page 11. >>

And it is not just about changing business models by allowing businesses to access global markets. Broadband also has the potential to revolutionise the way business is actually conducted. As broadband treats voice as if it were any other kind of data, Voice over Internet Protocol (VoIP) offers users new services that will change the entire audio experience. For example, users can participate in virtual meetings using shared data and video conferencing. VoIP also offers value added features such as integration with PC software that will ensure seamless working and improve productivity for businesses.

Broadband will be vital to all British businesses for entry into certain markets in the future – it's not just a nice-to-have, it's a must-have. David Hendon, Director of Business Relations at the Department of

Trade and Industry (DTI), says: "Increasingly companies won't be able to access markets that enable them to be competitive without exploiting ICT and broadband to the max."

According to Brendan Dick, General Manager of BT Scotland, countries which benefit from the next stage of globalisation will embrace what might be called an "economic triangle in which three imperatives – knowledge, entrepreneurial skills and competitiveness – are bound together by broadband communications and the networking capabilities they provide."

Business and government cannot underestimate the importance of broadband in a country where we face increasing pressure on traditional industries, such as manufacturing, from countries like China. It will form the backbone of a successful

knowledge economy that underpins future UK competitiveness.

UNPICKING THE STATISTICS

Building on the current positive figures about broadband, the broadband future appears to offer a wealth of opportunities. But it is also useful to interrogate these positive statistics more closely to see where the stumbling blocks lie. As Brian Condon of the Access to Broadband Campaign says: "There's more to the story than statistics... it does not tell you what people are doing or how they are using broadband."¹⁰

Indeed, a recurring theme of this report is that focusing on delivering technological benchmarks without considering the needs of the end user will create a world where there is a highly-developed infrastructure of which no-one understands the benefits.

CHARLES TROTMAN

Rural Economy Adviser, Country Land and Business Association



Back in 2002, the Country Land and Business Association (CLA) launched a campaign to lobby for the roll-out of broadband to rural areas. Three years on

and it is pleasing to note that, through BT, broadband coverage for rural communities now extends to 99 per cent of the rural populace. A clear example of pro-active lobbying and successful policy implementation.

But this is only the first stage, in a sense, the first battle to be won. The next battle, and one that is even more problematic and complex, is to increase the take up of broadband in rural areas and to both build a business case and to educate.

Back in 2002, the CLA believed that some 25 per cent of rural business would seek to purchase a broadband capability for the simple reason that many businesses would remain uneconomic without the technology. We still contend that this is the case but it appears there is another problem – the lack of education as to the technology itself but moreover, the benefits, both economic and social, broadband can bring to a business.

In economic terms, the cost savings can be significant. Let us imagine a small rural business, with a turnover of £350,000. This business relies on imported goods from Thailand which requires two orders to be made, from the UK to Thailand each day by phone. The total cost in telephone charges, over a year, is about £15,000. This equates to nearly 5 per cent of turnover. However, through the use of Voice over IP, with a 1MB broadband connection, this expense no longer appears. This could only be achieved by firstly, having a fast enough broadband connection, but secondly, by having the knowledge to realise that new technology can be a significant advantage, rather than the often perceived frustration. It points, quite simply, to proper education as to the resources available.

But we are still faced with the vast majority of rural businesses, even though they are now able to connect through broadband, failing to understand the business advantage. This is despite efforts made over the last two years to promote the uses of broadband technology. This lack of awareness, not only has detrimental impacts on a business' financial position, it also has a direct knock on effect on the rural community which, in practical terms, the rural business serves.

What can be done? In our view, there is required a defined partnership between Government, the rural economy, and the IT sector. This partnership needs to provide a clear educational strategy as to how broadband and new technology can be used by both business and the community. Rather than the Government spending up to £1 billion in trying to connect public sector services to the broadband network, and ultimately failing to deliver, money has to be set aside within a co-ordinated programme to provide the IT kit (the computer) and the expertise on how to use it to its full potential.

We are fortunate in this country that the broadband revolution has, in practical terms, only just begun. But all involved in this – Government, the rural industry and the IT sector – have a responsibility to educate. If in two years time, the CLA still receives the concerns of rural communities as to how to use broadband and still needs to explain and promote the business case, then, I'm afraid, none of us will have done our jobs and we would all be guilty of smug complacency. The arguments for broadband are not over – they have only just begun.

For example, despite widely available internet access, regulator Ofcom's figures show that almost half of all small businesses don't understand the need to access the internet¹¹. The provision of broadband access itself is not enough to drive small businesses online. As David Hendon at the DTI says, "Just giving people broadband is like giving them a nice driveway but no car. It does nothing for the economy, for business or for society. We need to raise awareness so that businesses can use it effectively."

One answer is education and awareness raising, focusing on the benefits of broadband. A number of contributors suggested consideration of some sort of education programme, jointly powered by central and local government and industry, to educate the business community about how the benefits will help encourage small and medium-sized businesses to utilise these new technologies to their maximum potential.

Having the skills to exploit the internet effectively is also important for all sizes of business, says e-skills UK, the organisation charged with creating the right skills environment for IT, telecoms and contact centre businesses. It emphasises that the UK needs to ensure that its education system and continuing professional development can deliver employees with the right mix of skills to succeed in the broadband economy. >>

"Just giving people broadband is like giving them a nice driveway but no car. It does nothing for the economy, for business or for society. We need to raise awareness so that businesses can use it effectively."

David Hendon, DTI

DAVID FROST

Director General, British Chambers of Commerce



More and more small businesses are now benefiting from broadband. For many it has transformed their business. Few would consider going back to dial-up

internet access. With broadband, downloads are faster and new software and e-enabled packages are available.

Our members cite increased productivity and efficiency as the main benefits of broadband. It allows them to have low-cost, direct contact with customers and suppliers which can help boost sales. As one Chamber member said, "with a broadband connection, my business can even trade at night while I sleep."

Businesses are also seeing broader benefits from the flexible working opportunities that broadband represents where this fits in with the needs of the business. For some small businesses, employees can be recruited from a slightly wider geographical area to get the right person for the job. Transport is a major, daily problem for businesses and so for some companies there may be benefits in allowing some employees to work from home using a broadband connection.

Despite all the benefits of broadband, many businesses are, understandably, worried about the risks – internet fraud, viruses and hacking can really damage a business. For any business, protecting its financial security and reputation amongst customers against these dangers are top priorities. Nine out of 10 small businesses have suffered a security breach of some form. For those with very small profit margins, this can be immensely damaging. It can be a matter of survival. We all need to work together to ensure security solutions are both high quality and good value. The British Chamber of Commerce is working with small businesses to increase their awareness of the threats and to provide practical solutions to the problems.

The issue of support is also crucial. Many small businesses do not have specialised IT support and are forced to deal with IT problems themselves. Helplines are often expensive and time consuming, yet there are few alternatives.

There is a collective responsibility on Government, business representatives and technology developers. Many small businesses say they would appreciate the services of an independent IT advisor to help them use broadband more effectively. Telecoms companies and internet service providers need to look again at how broadband is marketed to small businesses and start to focus on their specific needs.

Of course, small businesses take some responsibility themselves. Even with intervention from Government, the onus is on them to find out what is available and many are doing this. Through their local Chamber of Commerce they can find out what other members have been doing and build on that experience. Our e-business clubs provide information, advice, chances to use IT demonstration areas and network with other businesses. They can advise businesses on how they can exploit technology to the benefit of their bottom line.

Many of our businesses are proactive on these matters. They do not need to be told "you should be using broadband": what they need is practical assistance. Only if this is provided will there be a truly 'broadband' future for small businesses. If these issues are addressed, we anticipate that the next five years will build on the sound foundation that broadband already has, to create a vibrant and healthy small business sector that is fully exploiting the benefits of broadband technology.

Karen Price, Chief Executive of e-skills UK, says: "Today's broadband environment is accelerating the irrevocable intertwining of business and technology strategy. This means that a critical competence for all successful managers and leaders is their ability to understand and realise the potential of IT for business benefit. There are also increasing demands in terms of the whole UK workforce, with nine out of 10 new jobs requiring skills in the use of IT."

Until recently, there was no plan for the widespread development of the required skills in either the current workforce or the business leaders of the future. e-skills UK, was created in 2003 to work with industry, government and education providers to address this issue.

And what about those that remain on the wrong side of the positive statistics about broadband access? While most commentators agree that access is vastly improved, it's no consolation for those that still can't get broadband that they are in a very small minority, especially as by definition the vast majority of their competitors will be able to benefit from the technology.

In the article on page 8, Charles Trotman of the Country Land and Business Association argues there is a danger that the rural economy will be left behind without genuine and effective intervention from Government.

REASONABLE REGULATION

Regulation is identified by commentators as a key issue for the future success of a broadband-powered economy. There is broad agreement that the rapidly converging industries of telecoms, IT, broadcast, media and content sectors must not be regulated in silos and the creation of Ofcom was one important step in the right direction. However, Intellect, the trade association for the UK hi-tech industry, maintains that "fundamental structural divisions still exist and fuel a silo approach."¹² It says Government and regulators need to take a joined-up approach to converging industries to ensure that regulation is manageable and consistent.

But there is some disagreement about what level of regulation is required to protect the rights of those operating in the marketplace while continuing to foster innovation.



Antony Walker of the BSG, says: "If we allow a slow erosion of the concept of intellectual property, it also erodes the whole motivation for innovation in a broadband knowledge economy."

But other commentators question whether the huge drive by major music companies to stamp out piracy will have an adverse effect on innovation in content and applications development in the broadband future. The Open Rights Group (Org) is highlighting European and UK legislation which could threaten the rights of 'digital citizens'. A similar group in the US, the Electronic Frontier Foundation, campaigns against entertainment industry attempts to limit what consumers can do with digital media.

SECURITY AND SUPPLY

Security as an issue will continue to be of paramount importance. Independent trials by the US National Bureau of Standards suggest that the time taken for an unprotected PC to become infected once connected to the internet has fallen from two hours two years ago, to less than 20 minutes now¹³. In the broadband future, security will be a massive issue for businesses. As Jim Norton, Senior Policy Advisor on e-business & e-Government at the IoD, puts it: "Broadband-connected machines are in a state of virtually permanent electronic siege."

There are already many effective security solutions on the market, and industry education and marketing activity must emphasise this.

And while this report's aim is to move beyond a focus on speed and cost, it is vital to ensure that these two elements are managed carefully by telecoms companies and internet service providers for the broadband future to become a reality.

A vast majority of commentators mentioned cost as a prohibitive factor in take-up. And in a world driven by content-heavy media-rich services, what is needed are business models that deliver compelling propositions for businesses, ISPs and network operators. They can then all develop services at a price point and with a service package that make them "must have" services for their customers.

For this type of market to thrive requires an environment that encourages investment and supports creativity – something that BT believes will be underpinned by the development of its 21st Century Network.

CONCLUSION

In the future, broadband will help underpin the creation of a truly knowledge-based economy in the UK, allowing us to compete strongly against growing economies. It will create a more productive, efficient marketplace and a more flexible workforce, and by introducing new business models will change the shape of some sectors of the market altogether. But without fundamental support, many businesses will remain unable to fully exploit these opportunities. Government, regulators and the ICT industry must work with business to ensure the broadband future becomes a reality.

"If we allow a slow erosion of the concept of intellectual property, it also erodes the whole motivation for innovation in a broadband knowledge economy."

Antony Walker, BSG

JAMES MURFIN

Hosting Channel Development Lead,
Microsoft Hosted Services



With the increase of broadband penetration in the UK and access to enterprise-grade technologies typically enjoyed by larger organisations, small to

medium enterprises (SMEs) have never been better positioned to compete with their bigger rivals. SMEs also have the advantage of agility, enabling them to be more responsive to shifting customer and market demands. Combine this new-found 'agility' with the professional image created by companies who know how to leverage IT in efficient ways, and you have the start of a potential revolution that could shift the balance of power between large and small organisations.

Over the past few years, IT has become more accessible to SMEs in the UK. Computers have become more affordable and readily available, while software has evolved significantly, making the user experience far more intuitive and the value derived from it far more accessible. A more recent development has been the increase in broadband penetration, with Ofcom reporting that 2004 was the year in which broadband finally became a mass market consumer product in the UK.

SERVICE DELIVERY BY BROADBAND

SMEs in the UK have traditionally purchased software either bundled with their PCs or off the shelf. However, this method of purchasing software isn't necessarily the best for some SMEs. In addition, factors such as access to specialised IT expertise and ongoing IT maintenance costs restrict businesses and individuals from deriving the true value they expect from technology today.

In recognition of this, Microsoft and BT are working together to provide software-based services that SMEs can access via the internet, on a subscription basis. The initial hosted solution launched by the two companies will allow SMEs to manage their e-mail, contacts and diaries in an extremely efficient way, no matter where they are working. The service, called BT Business Email, gives SMEs access to regularly updated Microsoft software, support and expertise. It is available directly from BT at: <http://www.bt broadbandoffice.com/internetapplications/businessemail>

There are significant advantages to using a service provider such as BT to provide IT software. For example, SMEs can overcome issues of scarce in-house IT skills and resources by using the technical expertise made available by the service provider. Software services can be turned on more quickly than solutions installed at customers' premises, with responsibility for on-going maintenance and IT support undertaken by the provider. Additionally, regular updates available via the subscription model give SMEs access to the latest and greatest software. All this means that SMEs can spend more time growing their businesses, rather than deploying and maintaining technology.

Software delivered as a service over broadband also gives SMEs the ability to pick and mix IT solutions to meet their individual needs. These services are subscription based, largely because 'pay as you go' pricing makes more sense for SMEs. This model makes it easier to plan IT spending, reduce up-front capital expenditure and add extra services quickly and easily as the business grows.

THE TIME IS RIGHT

Thanks to broadband, a delivery and pricing model has evolved which now enables a greater number of SMEs to make use of enterprise-grade applications. Over the next few years more software in areas such as customer relationship management (CRM) and enterprise resource planning (ERP) will become web enabled and delivered through service providers on a 'pay as you go' model. As the playing field between large and small companies levels out, this is a good time for SMEs to explore their IT procurement and resourcing options in order to compete with their bigger rivals.



STIMULATING THE DEBATE

- Broadband will lead the democratisation of learning, making educational resources more accessible and more ubiquitous
- The schedule and curriculum could be more flexible and allow people to learn at their own pace
- Schools and colleges will be able to facilitate much more consistent dialogue with parents and guardians on their children’s progress
- Teachers and schools will need advice and guidance for this fundamental change in teaching practice; they will also need technical support
- Digital inclusion must be a priority to avoid pupils without home PCs being disadvantaged
- The Government and Local Education Authorities need to set out a sustainable long-term funding plan for broadband in education.

*These are some of our contributors’ views
– What do you think? Feedback at:
www.bt.com/broadbandthefuture*



Education and skills are at the root of what makes this country, and its economy, a success. In 2002, Prime Minister Tony Blair committed the Government to having broadband in all schools by 2006 as part of a drive to create a ‘knowledge-driven’ economy¹.

The Department for Education and Skills (DfES) has invested some £500 million in the installation and initial costs since 2000, and the department’s Steve Hogger, Programme Manager for the ICT in Schools initiative, says: “We’re confident that we are going to deliver the target, and even exceed it, with higher bandwidths going into some schools. It will be a real achievement.”

But how does broadband access change our education services, from schools and colleges through to university, and what will education look like in the broadband future?

THE DEMOCRATISATION OF LEARNING

The next five years will see broadband break down the traditional boundaries of learning by making educational resources more accessible and more ubiquitous. Gareth Mills, Head of Programme Futures, Innovation and E-Learning at the Qualifications and Curriculum Authority (QCA) says, “It is often said that the printing press represented the democratisation of knowledge. Digital technologies have the potential to bring about the democratisation of creativity.”

Broadband will extend education to those who may formerly have found it out of their reach. For children who, for physical or health reasons, have been unable to access education in school, broadband-enabled technology will be an educational life-line. They will have access to lessons streamed to them at home via a broadband-enabled video link.

The same applies to those with special needs like literacy support. Applications will become widely available that can speak text back as the pupil reads, allowing them to learn in their own time with the support they need.

Broadband will also make otherwise ‘niche’ subjects widely available. If your child is the only pupil in their year wishing to study a relatively marginal subject like the Russian language, cost and resource limitations currently may make this impossible. In the broadband future, lessons given by a teacher in one location will be streamed via a video link to another school, giving all children access to expert tuition.

Suddenly, a new range of options appears for those who want to learn but have been prevented by geographic, physical or financial boundaries. This applies not only to children but to adults learning at their local college or those undertaking professional development.

Broadband will also extend education to more adults who may have had negative experiences of school, giving them learning and skills that will improve their chances of employment. Ufi learndirect, which offers e-learning services for those with few skills or qualifications, has some two million learner accounts on its system. It expects this to grow considerably in the next five years.

Dick Moore, Director of Technology at Ufi learndirect says: “Broadband has a huge social impact through its ability to deliver learning to people who may not have done well at school, enabling them to participate in a knowledge economy.”

For these traditionally hard-to-reach learners, broadband provides a comforting level of anonymity and privacy. There are no global behaviour or personality judgements and no-one else has to know their marks.

SHATTERING THE SCHEDULE

The shifting of boundaries also applies to school schedules. “Education will no longer be something that starts at 9am and finishes at 3.30pm. Nor will it be confined by the walls of a school,” says Rebecca Bleasdale, Internet Product Marketing Manager at educational publisher Research Machines. >>

EDUCATION

KIRSTIE DONNELLY
Director of Products & Services, UFi

DICK MOORE
Director of Technology, UFi



Ufi is the company behind the learndirect and uk online networks. Since its launch in October 2000, 1.7 million learners have logged on to learn online with learndirect, at home, work or one of nearly 2,000 centres. Ufi's priority is pre-level two learners, those without qualifications equivalent to GCSE grades A-C. Many of these learners typically haven't had good experiences of education in the past, and are attracted to learndirect because of its flexibility and combination of anonymity and support.

Learning on a computer puts the learner in charge of their own learning, and for an adult audience, this is very attractive. People fit learning around the rest of their lives, at a time, place and pace to suit them, wherever they have access to the internet. Broadband has a significant role to play in extending this freedom through speed of access. People can learn exactly what they want, when they need to know it – just-in-time for a meeting or presentation – without having to wait for the start of term or the right bit of the curriculum to come round. Each time they log on they can do as much or as little of their course as they like, get instant feedback, and have the opportunity to make mistakes without being judged in a classroom full of people.

As we move away from an industrial manufacturing economy, where people routinely expected a 'job for life', we're becoming a fast-changing knowledge-based and service economy. In this environment people constantly have to update their skills to stay ahead. Education can no longer end at 16, and the internet has great potential to make lifelong learning easy and affordable. Blended with other types of education, online learning can provide context to a course or even a community of practice – bringing together a distributed group of people interested in the same subject area, and making a small interest group big enough to be a sustainable and viable 'class'. The opportunity for learning, researching and sharing information on specialist subjects is huge, giving people access for the first time to remote experts, tutors and fellow students.

Broadband also gives us an opportunity to further develop e-learning content, making courses richer, more engaging and more interactive. Game-based formats, consoles and mobile devices will be key in encouraging people to extend the use of their broadband connection from surfing and gaming to learning – helping them back into education. At the other end of the learning journey, broadband is already helping the growth of online assessment. Many tests are already sat, submitted and marked online, and we'll soon see more and more formal examinations being taken on the internet. In an increasingly knowledge and skills-based economy, speeding up and opening up education in this way can help many more people fulfil their own potential, and employers' expectations.

One of the many obstacles ahead is security, and the risk of identity theft or unacceptable use of systems. This exists in every area of internet use. The reality is broadband is reaching the homes of people who have only limited technical skills and do not know how to protect themselves or their machines. The digital divide is still very much in existence, and fear is perhaps the biggest barrier we need to overcome. Every day people walk into our centres without knowing how to use a mouse or turn on a monitor. As well as addressing this in learndirect centres, around 6,000 UK online centres in England are helping people – often novices – access the internet safely. They provide a friendly interface with job search facilities, e-government services and the increasing number of other public resources coming online.

Broadband is already at the heart of most businesses, and increasingly at the heart of many homes. Soon it will fade completely in the background and become invisible – integral to everyday life. To make that a reality and a success, providers, developers and interfacing organisations like Ufi will need to work together to create public confidence in our services, as well as enthusiasm and demand for them. Part of that is about demystifying the internet, and decoding the terminology which can confuse and alienate users. Accessibility is about more than just broadband, it's about helping people understand and make full use of online services.

In the broadband future, children and adults will be able to learn anytime, anywhere, whether it's in school or college, at home, at their friends' homes or on the move. Ultimately, the Government promises a 'personal online learning space' for each pupil where they can store course materials, homework and keep a record of their achievements.

The biggest impact of this is likely to be in the home. Children's homework will be set and completed via broadband using the personal online learning space, an exercise in which their parents can thereby become more involved, helping children to engage. "Providing access to school educational resources in the home helps involve parents in the learning agenda. Learners therefore benefit from improved engagement with learning", says John Parkinson, Head of Education at BT.

The integration of voice and data via broadband will also create cost and time savings for teachers. For example, unified messaging, which handles voice, fax, and regular text messages as objects in a single mailbox, will mean that a head teacher can collect telephone messages from their mailbox whilst moving round the school and keep abreast of any issues as they arise.

ANYTIME ASSESSMENT

The broadband future is likely to see the end of the summer exam period, with pupils sitting exams as and when they are ready during the school year.

Online assessment will also allow significant cost savings and major efficiencies for schools. In the summer 2005 examinations, the exam board Edexcel saved time and money by scanning in four million scripts and delivering them to examiners via broadband internet. This is the first stage in a significant transformation of the exam system. Ultimately, they believe whole exam papers will be sat, delivered to examiners and marked online, with this happening in some subject areas as early as 2006.

A RICH, PERSONALISED LEARNING EXPERIENCE

Educationalists increasingly recognise that the traditional broadcast model of a teacher imparting information from the front to a classroom full of pupils is not effective for everyone. Technology is key to creating a personalised education offering. Broadband-enabled applications will offer a whole host of interactive learning methods from which the end user can choose according to their needs, be it interactive quizzes, real-life simulations or video and audio presentations.

For example, educational publisher Research Machines has created a 'Living Library' which has a range of multimedia resources that pupils can use to learn, including articles, images and videos. Edexcel is piloting online GCSE examinations in science and geography which incorporate rich media such as video and animation to create a realistic and enriched exam experience. Both these organisations believe that all of these applications will be mainstream by 2010.

Developers are creating adaptive technology that learns as it works with a pupil, enabling it to predict what next step would be most helpful to the pupil. Professor Steve Molyneux, Director at Learning Lab, a centre of excellence in learning technologies, says "With 'intelligent tutors' that anticipate what we will need next and offer us suggestions for our next move, our rate of learning increases by two units of standard deviation (at least)." In the broadband future, the curriculum is much more flexible and children can learn at the pace that's best for them.

Importantly, "Learning through broadband is not something that is done to you, but is something that you do yourself," says Steve Hogger at the DfES. That is very empowering for people who may have been turned off by the passive 'broadcast' model of teaching.

DEVICES

The broadband future expands far beyond the fixed world of the PC. Developers are working now on the range of devices children will be using to learn in five years' time. These could include mobile devices or broadband-enabled Internet Protocol Television (IPTV). Several commentators suggest that to really engage with the end user, these will need to combine the best features of popular entertainment or media devices, like the iPod or X-Box, with specific educational functionality.

With 1.5 billion mobile phones in the world today, more than three times the number of PCs, these are also likely to play a role in the future of education. The Learning and Skills Council sponsored the 'm-learning project', which developed learning materials to run on mobiles. It found that mobile devices can be used successfully to involve some of the hardest to reach and most disadvantaged young adults in learning.³

BUILDING COMMUNITIES OF LEARNING

In the broadband future, clusters of schools will work together and share best practice, knowledge and learning, as will groups of pupils with common interests, through broadband communities. Pupils will be able to tap into global information and knowledge from an early age.

Schools systems already tie into the Joint Academic Network, a national online system which hosts educational and university content. These educational networks will develop dramatically in the next five years.

PATCHING IN THE PARENTS

Broadband will facilitate systems which can regularly share information with parents about their child's progress using broadband. The Government's e-learning strategy aims to create systems that will enable parents to track their child's learning online, trace their progress through school and check their test results⁴. "Schools will be able to create a more effective and continuous dialogue with parents and guardians on their child's progression," says Rebecca Bleasdale at Research Machines. >>

“Outside playtime, all of the children’s homework is set, written and marked online. Parents can get to review homework and can monitor the progress their child is making on a daily basis against school, county and national norms.”



Steve Coppins, South East of England Development Agency (SEEDA)





In an article written for the Broadband Stakeholder Group, Steve Coppins at the South East of England Development Agency (SEEDA) gives his personal vision of how this would work: “Outside playtime, all of the children’s homework is set, written and marked online. Parents can get to review homework and can monitor the progress their child is making on a daily basis against school, county and national norms.”⁴

PULL NOT PUSH

The top priority for the use of broadband technology in education is ensuring that it is an education pull, not a technology push, which characterises the relationship with the learner.

Simply putting broadband-enabled PCs in every classroom won’t persuade learners to use them or enable them to use them to their full potential. As Steve Hogger at the DfES says, “Having broadband is not an end in itself. It’s how you use it for improved teaching and learning that matters.” Compelling content and applications will drive engagement.

However, while educational publishing is a big industry, it is not a wealthy one and so tends to focus on updating existing broadcast models of teaching, such as the interactive whiteboard. This means that currently society is still missing out on the transformative potential of broadband as an educational medium, offering a completely new way of structuring and delivering education.

What is needed is a leap of faith by the educational publishers. “Broadband will allow us to do more than enhance traditional models of learning and participation, it will allow us to create new models,” says Gareth Mills at QCA.

TEACHING THE TEACHERS

The other key driver of successful internet usage in schools is proper exploitation by teachers.

A study by sociologist Neil Selwyn suggested that much educational usage of the internet currently tends to focus on IT skills rather than branching into the broader curriculum⁵. Commentators underline the importance of having teachers and headteachers with an understanding of the possibilities to really transform education.

Teachers and schools will need differing levels of support. Some schools will need advice on which broadband provider to choose as well as what applications they should purchase, or advice on how to integrate broadband technology into the broader curriculum.

Others may need technical support. Many primary schools for example do not have a dedicated IT support person and Steve Hogger at the DfES says, “Technical support for school ICT systems can be a real challenge, particularly for small schools.” The DfES is trialling managed services for schools but many find the cost prohibitive when deciding how to allocate budget.

Most importantly, all those involved must appreciate the step change this represents for the education sector which has used similar methods of teaching for decades.

Anthony Burgess, Senior e-learning Policy Manager at the Learning and Skills Council, says: “Teachers are worried about using technology, about their jobs changing and even about losing their jobs. They need support and reassurance.”

The introduction of broadband, according to the Broadband Stakeholder Group, represents “a major systematic change to traditional methods of teaching, learning and administration”⁶ and urges

an effective change management process from Government to ensure all stakeholders feel motivated and reassured.

INCLUSION AND ENGAGEMENT

Learner engagement with, and access to, broadband continues to be an issue. While broadband availability is high and uptake throughout the UK is increasing, Government figures say that only 56 per cent of households with children have internet access⁷. Evidence suggests that pupils who have access to computers at home have higher attainment than those who don’t.

So what happens to those on the wrong side of the so-called digital divide? Some schools are trialling charitable laptop leasing schemes for those who don’t have a home PC but Citizens Online, which campaigns for digital equality, has suggested the government should provide laptop computers for every schoolchild by 2010.⁸

The Government’s work on digital inclusion will address these areas but inclusion must be a priority for all those working in this area.

SECURITY AND SUPPLY

The issue of internet abuse is a critical one for parents nervous about their children’s internet usage, following media coverage of negative activity online. In addition, according to a report in the Guardian newspaper, “Broadband internet access and 3G mobile phones have spawned a host of new and sophisticated forms of bullying”⁹.

While most schools do now have an internet use policy in place, these are notoriously difficult to enforce. Parents will want reassurance about how internet usage is being monitored and expect schools to implement the necessary security measures. “Local education authorities should also encourage schools to select their providers with safety and security in mind as well as price,” says Rebecca Bleasdale at Research Machines.

The quality of supply is also vital. Should the broadband connection be lost during an examination, the consequences could be significant and erode the confidence of teachers, pupils and parents in the system. “If we’re going to be delivering high stakes examinations over the internet into schools, we need a very rugged broadband network. It cannot go down,” says Paul Humphries at Edexcel. Once again, advice on choosing a provider is vital.

MONEY, MONEY, MONEY

The Government has invested significant funding into the provision of broadband access to all schools. But the ongoing costs are significant and funding provision is complex. Broadband provision costs can range from £2,000 – £12,000, a significant figure for schools, which face constant pressure on budgets.

Our interviews and existing research underlined a need for the Government to clearly articulate a long-term funding timetable for broadband in the education system. A sustainable long-term investment plan is needed.

CONCLUSION

The majority of stakeholders agree that the use of broadband technology in education is a desirable future. In the main, the infrastructure is there. It is now important to ensure that both children and adults have the skills and the applications they need to use broadband to create rich, personal learning experiences, in a safe and secure environment.

Society is on the horizon of a new model of teaching that blends personal interaction with technological activities. Sustainable funding sources, school advice and support and the best applications must be a key focus to deliver this broadband future.

“Local education authorities should also encourage schools to select their providers with safety and security in mind as well as price.”

Rebecca Bleasdale, Research Machines

GARETH MILLS

Head of Programme Futures, Innovation and E-Learning
Qualifications and Curriculum Authority



Qualifications and Curriculum Authority



The first question to ask when using technology, broadband or otherwise, is ‘what do you want to do?’

We want our young people to enjoy learning and be skilled enough to use technology for learning, life and work – we want e-confident learners.

What does this mean? E-confident learners are more than spectators of multimedia lessons from a whiteboard at the front of a class. They are active participants in their learning. They use ICT tools to engage in a range of worthwhile activities.

E-confident learners are researchers. They use technology to find answers to questions and make judgements about the quality of the information they find. They use information to generate new ideas and products. They use ICT as an analytical tool – creating charts to identify trends and patterns in data. They create computer models and look for alternative solutions to problems. They become skilled at investigating ‘what if’ type questions.

Importantly, they use technology to support creativity. They engage in ‘possibility thinking’ and use ICT to play with ideas, draft and redraft material as they explore options. They are more than an audience for information – they act like real writers, designers and film-makers do in the world outside the classroom.

E-confident learners change the way we think about schooling by extending where, when and how learning takes place. The walls of the school disappear as they communicate with experts and e-pals from around the globe. E-confident learners present their work to a wide audience through websites, on-line galleries, pod-casts and e-mail. Evidence suggests that having an audience beyond the teacher raises the quality of work.

Broadband opens the door to these types of activities; it adds value because working collaboratively with multimedia files in a connected world needs to be seamless and speedy.

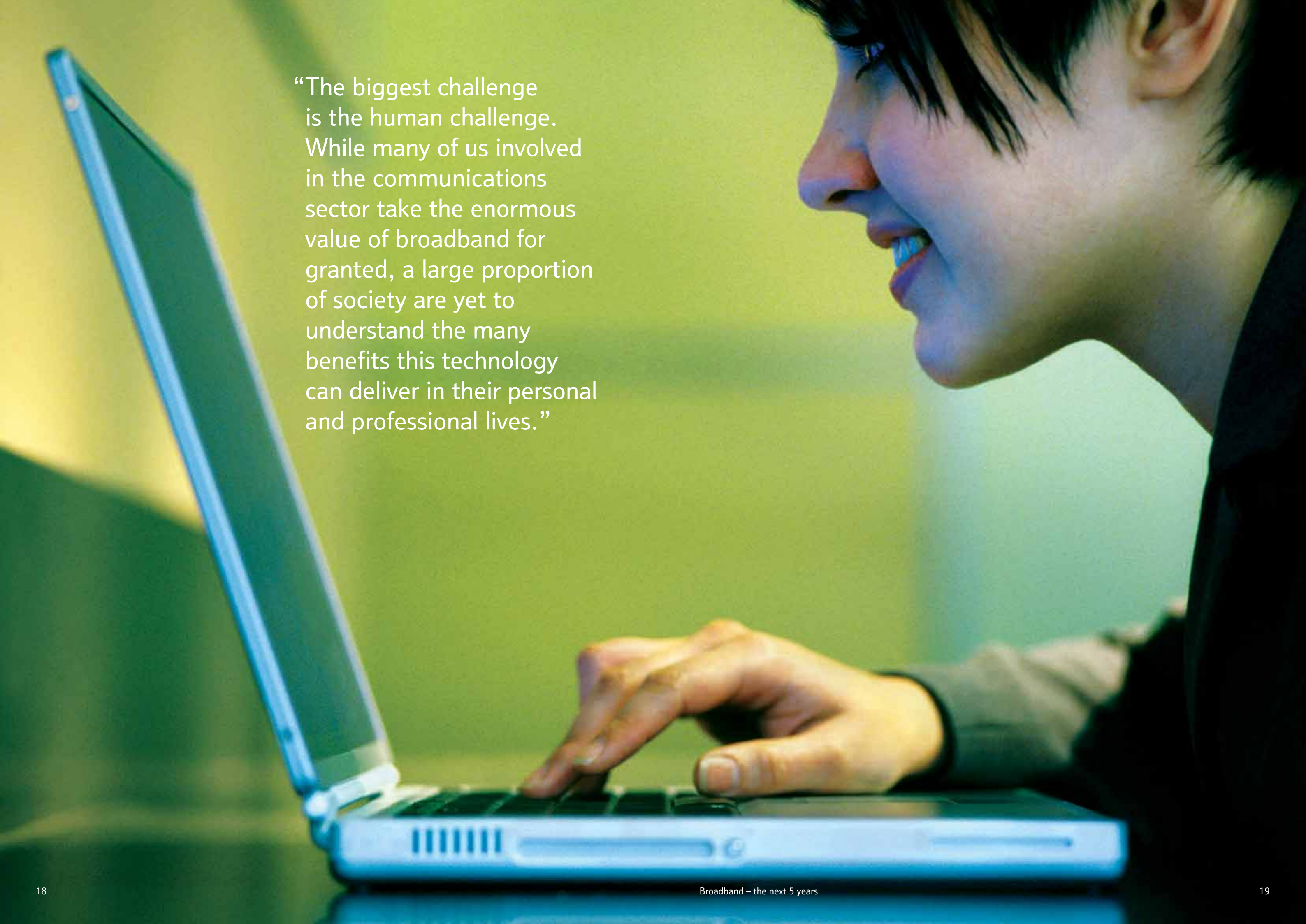
Having decided what we want to do, the second question is to decide how we recognise and reward what young people achieve. We do this through our assessment system. So how might this be transformed through technology?

First should be a quest for authenticity. We all recognise the validity of the flight simulator in training and assessing pilots. The notion of using authentic simulations is where we should take some of our current pencil and paper tests. QCA’s forthcoming ICT assessment, for example, works by setting students tasks by e-mail and capturing how well they solve problems using ICT tools in a virtual world.

We should use technology to capture a more rounded view of the capacities of young people. E-portfolios offer a way to achieve this. Every learner will have a personal learning area where they can gather and present examples of their achievements. Web-based access can then be tailored to meet the information needs of parents, subsequent teachers or employers.

Another important notion is that of ‘when-ready’ testing. This would mean that learners could access assessments when they are ready and progress at a pace that suits their abilities.

Technology opens up opportunities for new ways to address old problems. In addition to being literate and numerate, today’s young people also need to be e-confident to participate fully in society. Broadband, like motorways, is an important part of our national infrastructure but we must also be sure we are driving to the right destinations.

A close-up, profile view of a person with dark hair and glasses, smiling while looking at a laptop screen. The person's hands are on the keyboard. The background is a soft, out-of-focus green and yellow light. A quote is overlaid on the left side of the image.

“The biggest challenge is the human challenge. While many of us involved in the communications sector take the enormous value of broadband for granted, a large proportion of society are yet to understand the many benefits this technology can deliver in their personal and professional lives.”

HEALTH



STIMULATING THE DEBATE

- **Broadband underpins the creation of the first integrated national information network for the NHS, helping to cut waiting lists, reduce costs and enable the sharing of medical records**
- **Upgraded infrastructure provides a robust network ensuring that current and new systems and services run smoothly and delivers sufficient capacity to implement new approaches to healthcare**
- **New services, powered by broadband, will offer faster and more efficient treatment with online access to records and visual images when and where needed**
- **Information therapy delivered through broadband will help people manage their own health and prevent illnesses more effectively**
- **The use of technology in healthcare must be approached with the utmost sensitivity and consider carefully the needs of the patient**
- **The health and social care workforce will need encouragement and support to engage with technology and change their working practices.**

*These are some of our contributors' views
– What do you think? Feedback at:
www.bt.com/broadbandthefuture*



It is axiomatic to say it is vital for information to be available at the touch of a button for those in healthcare. If any sector needs this capability then it is the one where decisions can be a matter of life or death. For this to be possible at a time when health IT applications are getting ever more sophisticated in nature and hungry for bandwidth, broadband communication is essential.

Applications such as Picture Archiving and Communications Systems (PACS) which allow x-rays and scans to be digitally transmitted and electronic patient records which contain visual images as well as data, need high-capacity, high-speed broadband communications.

Add to that the increasing numbers of patients and clinicians accessing information online and the resulting growth in traffic then the case for broadband is irrefutable.

Healthcare providers in both the private and public sectors have taken note and are increasingly using sophisticated IT services to improve patient care and drive overall efficiencies, all underpinned by broadband technology.

Today's National Health Service in the UK is just one example where broadband is helping to transform patient care.

As an essential part of the Government's ten-year plan to modernise the NHS and improve patient care, NHS Connecting for Health, an agency of the Department of Health, is delivering the National Programme for Information Technology (NPfIT), said to be the world's largest civilian IT programme, which aims to create an integrated, computerised system to handle the records for 50 million patients in England.

This £6.2 billion programme plans to roll out a new IT infrastructure to support new patient-centric services for the NHS in England. The programme and its various applications such as the Electronic Transmission of Prescriptions, the Choose and Book service and the NHS Care Records Service, where every paper patient record will be replaced by an electronic version, is dependent on a broadband network that BT is currently rolling out in England.

The demand is huge. There are 300 million consultations in primary care annually, with each person visiting their GP an average of six times a year. In 2002-3 more than 624 million prescription items were dispensed in the community, more than 5.3 million people were admitted to hospital for planned treatment, there were 13 million outpatient consultations and nearly 13 million people attended accident and emergency of which 2.3 million were emergencies.

N3 – the national network for the NHS – is a seven-year commitment by the NHS and BT to provide a reliable, supporting IT infrastructure, world class networking services and sufficient, secure connectivity and broadband capacity. Neil Hemming, BT Chief Executive of N3, says "N3 is essentially working to connect the NHS world completely, introducing a world class, best value, multi-service, multi-vendor network."

N3 makes the NHS the first major user of significant broadband capacity in the public sector. It will provide a reliable means for data to be exchanged between NHS organisations and enable much faster electronic transmission of visual data such as videos and x-rays.

It will connect all 18,000 NHS locations and sites in England and will significantly speed-up the transfer of key clinical data between NHS organisations. BT will source network connections from a range of network providers and will be responsible for the end-to-end integration of the network and the overall service it provides.

Using high-speed broadband connectivity, the national network will support one of the largest virtual private networks in Europe, catering for the huge data flow within the NHS.

By the end of 2005, BT had connected more than 13,000 sites and recently announced that it had been awarded a similar contract with the NHS in Scotland.

Sufficient broadband bandwidth is necessary to implement new approaches to healthcare. These networks need to carry vital new applications that will require bandwidth in excess of the previous network. Len Chard, Programme Manager for N3 in NHS Connecting for Health, says: "As the availability and capacity of broadband develops, great possibilities exist to provide cost effective, value for money solutions to the NHS."

NEW APPLICATIONS

These applications will include PACS, which captures, stores, distributes and displays static or moving digital images such as electronic x-rays or scans, for more efficient diagnosis and treatment. It also enables images to be sent at faster speeds and viewed at one or several NHS locations and has the potential to transform patients' experience of the care they receive. >>



“This technology will help people live at home for longer without unnecessary intrusion into their lives. It is already bringing a better quality of life to elderly and vulnerable people...”

Paul Garner, Head of Pervasive ICT Research Centre, BT



The Electronic Transmission of Prescriptions (ETP) programme, part of the National Programme, will enable a service which will allow prescriptions generated by GPs and other prescribers to be transferred electronically between prescribers, dispensers and the reimbursement agency. And, the development of electronic health records shared via broadband will help to achieve the aim of freeing up well-qualified staff to do more productive work than time-consuming administrative tasks such as locating notes.

Outside the remit of the National Programme, the NHS is using broadband networks to enable clinicians to share their knowledge and expertise in a much more efficient way through communities of practice. In Basingstoke, the Pelican Cancer Foundation is using broadband

and satellite technology to promote the development and teaching of precision surgery techniques for cancer. The broadband technology will also enable rural or remote hospitals to link with larger urban hospitals to share best practice.

A MODERN NETWORK INFRASTRUCTURE

As well as the clear benefits of new clinical information systems, there is enormous scope for NHS organisations to achieve savings by rationalising back office and corporate systems using broadband links and Internet Protocol (IP) telephony. The starting point for realising these benefits is modern integrated IP networks which converge voice and data networks.

Essex NHS Strategic Health Authority (SHA) is one of the first authorities to take advantage of the capabilities of such a modern converged IP network. BT has been awarded the contract to develop the network across 580 sites in the county and plans to implement a county-wide IP telephony system, video conferencing and CCTV.

The new network is expected to make the Authority savings in networking costs and takes advantage of N3. Essex SHA will use N3 to link up all of the county's hospitals, GP practices, the ambulance service and other NHS offices, to create a converged voice and data network using IP technology.

Janette Leonard, Director of Information for South Essex Partnership NHS Trust, says “N3 offers significant cost benefits over its predecessor, but by taking N3 one step further and designing it for voice and data services we can realise even greater cost savings for Essex SHA. At the same time we can support more flexibility in how NHS organisations can provide health care services for patients in Essex. I'm delighted that we are at the forefront of this development.”

CONTACT IN AN INSTANT

In a hospital environment, it is vital for key personnel to be located and contacted immediately. The Royal Cornwall Hospitals NHS Trust in Truro plans to use an innovative new system that will allow doctors and nurses to contact each other instantly while on site through voice-activated hands-free devices that can be worn like a badge. The devices operate on a broadband wireless Local Area Network (LAN), weigh just a few ounces and enable users to speak to each other securely. By simply saying a brief command, such as

DR SHERRIN MOSS

Healthcare Markets Manager, BUPA

ANDREW VALLANCE OWEN

Group Medical Director, BUPA



There is no doubt that broadband has the potential to have a very positive impact on the way we deliver healthcare services in the next five years. Information therapy, telecare, homecare, online appointment booking, communities of expertise – all of these things have promise and if developed correctly can make a difference to people's lives and help them feel better.



At BUPA, a significant part of the care that we offer is information. Broadband will allow us to deliver more information, to be more supportive, to be more flexible. The promise of a personalised combination of video, text, internet and telephony will enable our patients to have all the knowledge and advice they need, at any time and in any place.

So for a patient who is due to have a knee operation, we could send information about how to prepare for surgery, a checklist of things to bring on the day of surgery, along with a map and photos of the hospital he will be attending. Once he is discharged from hospital, we will be able to send a video clip of recommended recovery exercises to his mobile and complete our patient surveys on health outcome.

So broadband can deliver many positive benefits to the way we deliver and manage healthcare services. But there are risks in the convergence of health and technology that need to be carefully managed. Healthcare is an extremely emotive subject. Those receiving treatment are often feeling vulnerable and may be less able to cope with stressful health situations using technology rather than face-to-face with a healthcare professional. However, there are many circumstances where the benefit of instant access to personal medical information will outweigh any downsides.

In addition, health information is in many ways more precious than other personal details as it can have a profound impact on your personal and financial status should it for any reason be accessed inappropriately.

Ultimately we must ensure that the patient benefits from the opportunities that broadband technology offers. Our underlying aim in everything we do is to improve a patient's experience and we keep that goal in mind in all our developments.

We must also get the balance right with the services we offer to our patients between those that can be delivered using technology and those that need the personal touch. If I am in hospital, it is likely that I am very ill and probably the last thing I want is to be tended to by doctor or nurse via a video link. However, if I have been discharged to a hospital near my home and I am convalescing, to have the specialist consultant be able to talk to me through a video screen is adding value. We need to offer a blend of technology and human services that make the patient comfortable, confident and reassured.

Broadband-enabled technology can really make a difference to the patient community if it is thoroughly researched and tested and the quality of service is high. As we develop more and more blue-sky ideas, let's keep the patient in mind and try to create something that really adds value for them, as well as pushing the buttons of the technologists.



a person's name or department, users are automatically connected with the appropriate person and can speak to them wherever they are on the hospital site. Called BT Managed Vocera Solutions, the system is expected to offer time and cost savings over alternative methods of communications. The technology uses mobile Voice over Internet Protocol technology to convert voice into IP packets for transmission over the network.

HEALTHCARE AT HOME

Telecare services, 'powered' by broadband, will fundamentally change the lives of elderly people and those with long-term conditions by providing health services outside of the traditional healthcare environment. The Government is providing £80 million to local authorities for the funding of telecare from April 2006¹.

Telecare covers three main areas, which can be combined according to the needs of the patient or end user: provision of information; safety and security monitoring; and physiological assessment.

The provision of care-related information to users over the telephone, internet or via digital TV is one key area. Broadband will enable a new range of communications channels between patient and consultant. For example, a patient recovering from a knee operation could have a video file sent to their mobile phone demonstrating useful physiotherapy exercises.

Telecare monitoring services will ensure the safety and security at home of elderly people or those with chronic illnesses who need long-term care. This is a critical healthcare issue

for Government. By 2011, the number of over 65s is projected to reach just under 12 million². This, coupled with a reduction in the number of local authority care home places available, means the UK's health resources will be under increased pressure. These services support continued independent living while preserving quality of life for people with home care needs.

Liverpool Direct Ltd, a joint partnership between BT and Liverpool City Council, has been piloting telecare solutions for social services clients.

The pilot placed a number of unobtrusive wireless sensors throughout the home and a small control box connected to the telephone line. The system monitors the client's activity and builds up a model of their behaviour and can detect situations in the home that may pose cause for concern, such as an unusual lack of activity which may be caused by a fall.

The in-home system is then able to communicate directly with the occupant, to either prompt them to remedy the problem or to verify that assistance is required. If an alert situation persists, an alarm is then sent to the Liverpool Direct Call Centre who can address the problem or contact a relative or carer. More advanced systems in development will also detect safety issues such as a gas supply being left on accidentally or an unlocked door.

As well as reducing the cost of care both for society and the individual, these broadband-enabled systems represent a lifeline for elderly and frail individuals who want to avoid being institutionalised. Paul Garner, >>

NEIL HEMMING
BT Chief Executive of N3



The introduction of broadband technology to the NHS as part of the National Programme for IT, which is being delivered by NHS Connecting for Health, means that, for the first time ever,

all NHS organisations – and all those delivering NHS services – will be connected by 2007, to a single, secure, reliable and fast network. Known as N3, this network will underpin and enable organisations to host a range of new applications and services, such as the Electronic Transmission of Prescriptions, the NHS Care Records Service and the Choose and Book service.

The contract to deliver N3 has been awarded to the N3 Service Provider (N3SP). Managed by BT, N3SP is responsible for integrating and providing an end-to-end seamless network service procured from a number of different suppliers.

Even during these early stages, broadband is helping the National Programme to improve patient care and the working lives of staff. The programme to migrate more than 11,000 main and branch general practice surgeries to the N3 network is nearing completion, providing broadband networking services to all.

As the availability and capacity of broadband technologies develop, even greater possibilities exist to provide cost-effective and innovative solutions to improve patient care across the NHS. Professionals in the field will have access to a richer set of care information, providing a more customised service for their patients. Some examples of the possible improvements broadband can bring are:

- The capacity to provide home monitoring of patients through video consulting and remote diagnostics will emerge, and this can reduce patient and NHS travel needs, as well as releasing valuable acute bed space;

- Broadband video will facilitate multi-disciplinary care teams working in a virtual environment, for example, social services teams will be able to work alongside primary and secondary care teams;
- GP to GP systems will allow the transfer of patient records – files that can sometimes exceed 40 megabytes – electronically when people change doctors through relocation.

Future developments seem almost endless with new applications becoming successively more innovative and utilising new broadband functionality, which in turn will bring more organisations and innovation to the marketplace. The vision will be a health environment where seamless services interact transparently, providing the patient with 24x7 communications access.

To realise the full potential of broadband technology, services need to be ubiquitously available across the NHS with standards fully developed and implemented. Security of patient data and patient confidentiality must be assured alongside any new developments. The network must be able to support real-time applications appropriately and enable such applications to roam seamlessly between infrastructures and their suppliers, as many more robust and cost effective devices become available.

The sheer complexity of connecting more than 18,000 organisations in what is said to be the biggest IT project in the world will continue to be a challenge. Embracing the IP future will also require large scale investment and the adoption of new skills which poses a massive operational challenge and will require new behaviours throughout the whole IT industry.

N3SP, working with NHS Connecting for Health, will continue to facilitate best practice, replicate innovation and ensure targets are met, whilst providing an environment that encourages change. N3SP realises the necessity to maintain the appeal of the health ICT market for industry partners, whilst being realistic in what can be achieved.

Head of BT's Pervasive ICT Research Centre, says: "This technology will help people live at home for longer without unnecessary intrusion into their lives. It is already bringing a better quality of life to elderly and vulnerable people in Liverpool."

The third application area in telecare incorporates physiological assessment and will be useful for those with long-term illnesses. The Carlisle and District Primary Care Trust and the Carlisle Housing Association developed a service to support early discharge from hospital of patients suffering from the heart condition, Chronic Obstructive Pulmonary Disorder.

Using a monitor developed by the Tunstall Group, patients measure their own temperature, blood oxygen saturation levels, heart rate, breathing rate and non-invasive blood pressure. The monitor records the results and sends them to a secure server where they are saved as an electronic patient record which is accessed by the clinician in charge.

This enables early diagnosis and intervention to prevent deterioration in the patient's condition which might require hospitalisation, thereby reducing the average time spent in hospital by half. It also made patients feel reassured that they can manage their own condition. One patient said: "This has given me a high degree of independence and flexibility and makes me feel less anxious."³

Shorter stays in hospital prevent bed blocking, reduce the risk of hospital-contracted infections like MRSA and help make cost savings for the NHS. The Department of Health has set out ambitious targets to have telecare available in all households that need it by December 2010.⁴

INFORMATION THERAPY

The 'holy grail' of public healthcare policy is improving peoples' health through preventative health advice – a national health system that invests as much time in keeping people healthy as it does treating the sick. Broadband will underpin a sophisticated system of 'information therapy' to educate the public about their own health and educate them about preventing illness.

This ultimately should contribute to the health and well-being of the nation and reduce the costs of the NHS. NHS Direct is an early prototype of what is to come and has been very successful, with some

"We need to do more research with patients and the public, clinicians and management to better understand what will add value for them and what won't. Sometimes the technology runs away with itself without properly addressing the needs of the patient and user."

Dr Sherrin Moss, Healthcare Markets Manager, BUPA

97 per cent customer satisfaction levels and more than 100,000 calls a week. In years to come a much more sophisticated information and advice system will be delivered through a variety of broadband applications including Internet Protocol TV.

RECOGNISING THE RISKS

Despite many positive opportunities, there are risks in the healthcare arena that must be borne in mind to ensure the positive potential of the technology is delivered. People who are in ill health may be anxious, weak or in pain and will be less tolerant to technical hitches or difficult to use systems. The consequences of a breakdown in the technology could have an impact on the health of the patient and must be approached with a high level of sensitivity.

Evidence suggests that chronically ill or care services patients are concentrated in those socio-economic groups which also tend to have lower PC ownership and poorer ICT skills. Telecare devices which interface with the patient must be intuitive and require little technological expertise to operate. They could, for example, be based on technology that is familiar to the end user, such as the Sky remote control or a mobile phone.

"Mobiles, TVs and other electronic devices are all part of the solution", says Dr Sherrin Moss, Healthcare Markets Manager at BUPA. To the end user, the service must be seamless regardless of what platform, application or device is used. The onus is on the developers in the IT industry to be as consistent as possible.

Some commentators warn of a danger that the technology can become out of line with patient needs. Government and private healthcare providers need to undertake extensive research to understand

their end user. Dr Moss says, "We need to do more research with patients and the public, clinicians and management to better understand what will add value for them and what won't. Sometimes the technology runs away with itself without properly addressing the needs of the patient and user."

ENGAGING PEOPLE

For the health and social care sectors, adoption of and engagement with technology is an issue. These sectors, particularly social care, are a long way behind other parts of the public sector, and engagement with technology must be a focus for education and professional development.

Professor Mair said in GP Magazine: "Although telecare is in all the policy documents my impression is that the average healthcare professional does not know much about it. There is a division of the rhetoric of where this is going and where practitioners are thinking about going."⁵

In addition, the current healthcare market sees a whole host of different devices, operating systems and codes being used. These need to be streamlined so there is a common standard for telemedicine to build on successfully.

As the use of these techniques crosses the boundaries between health and social care, those involved also face the challenge of getting these services to work across organisational boundaries. In many ways, this represents more of a challenge than the technology aspects of telecare.

CONCLUSION

Broadband can enable healthcare solutions which complement the traditional approach to provide greater comfort, support and peace of mind for a whole host of patients.

GP surgeries, primary care trusts and hospitals will benefit from faster, secure access and the ability to share and view large data files, patient records, video links and visual materials, such as x-rays. This will enable greater co-operation between different parts of the NHS and faster, more efficient patient treatment. The network will also be designed for future expansion, so that over time other healthcare professionals, including dentists, pharmacists, opticians and social services, will be able to access the network.

In a country with an ageing population and a pressured healthcare budget, broadband will help make it possible to deliver the reforms and services that can support a wider range of options for treating patients which not only offer a better quality of life but also could create savings for the NHS. Engagement with the health and social care workforce and a strong understanding of patient needs will drive the success of this area.



ENTERTAINMENT



STIMULATING THE DEBATE

- Broadband will soon link into a number of devices in the home, with TV being the next medium to become broadband-enabled
- The digital home, where a small number of devices meet all entertainment, communication and computing needs and where consumers can stream content between them, will become an affordable reality
- Personalised and community content, as well as the rise of the citizen publisher, will be defining features of the broadband future and will drive broadband engagement
- Developers must tackle complexity and ensure standards of interoperability are met or consumers will not engage
- British businesses must move fast in creating digital rights management systems and content platforms to avoid being a 'me-too' nation
- Consumers will need effective and easy-to-access technical support to manage potentially complex home networks.

*These are some of our contributors' views
– What do you think? Feedback at:
www.bt.com/broadbandthefuture*



In 2000, the dot-com boom was at its peak, and media and entertainment companies were scrambling to create a web presence. Much of the initial hype of that time has not lived up to reality.

But now, entertainment and media looks to be on the edge of a new revolution, this time powered by broadband. And this revolution looks promising. The ability of broadband to deliver data, voice and video in one pipe opens up a whole world of possibilities for entertainment devices and content. PricewaterhouseCoopers believes broadband will propel the value of the worldwide entertainment and media industries to \$1.8 trillion by 2009¹.

How will this new era change the way consumers enjoy media and entertainment content? And what needs to happen to deliver real and lasting change this time around?

THE BROADBAND FUTURE: NETWORK AUDIO IS JUST THE START...

Network audio has been the first media sector to benefit from broadband internet. In July 2005, Apple sold its 500 millionth song through its iTunes music download platform. This functionality has also driven the phenomenal sales growth of the company's iPod portable media player. However, iTunes is still very much focused on broadband internet delivered through a PC for its service.

The next stage in the broadband revolution is the ability to plug your broadband connection into your hi-fi to connect to internet radio stations. It is the beginning of a seismic shift in the relationship between broadband and entertainment devices. "Broadband will soon link into the TV, the stereo or any number of devices, which makes it a completely different proposition," says Hitendra Naik, Entertainment and Media Global Alliances Manager at Intel.

Television will be the next medium to become broadband-enabled. "For broadband penetration to move into the next phase it needs to be in the living room – either wirelessly or wired into the television. And for that environment, video is key to success," says Jonathon White, Services Development Manager at Sony.

The broadband-TV connection has the potential to provide access to an enormous bank of archived and community-based content and can bring a whole new audience segment into to the broadband fold. BT's next generation TV services will combine access to digital terrestrial channels, an exclusive video-on-demand library, 'catch-up' TV and a range of interactive services. "Suddenly you've got an appealing value proposition for the 35 per cent of the population who don't own a PC to have a broadband connection," says Andrew Burke, CEO of BT Entertainment. Next generation TV services, like BT's, will meet the key consumer drivers of choice, convenience and control over their home entertainment, and will allow them to benefit from the combination of television, communications and the internet. For example, football fans across the country will be able to chat using video telephony while they watch a match.

The potential is great for broadband-delivered video content. Every home in the UK will download at least one movie using their broadband connection by 2010, giving film makers a potentially lucrative new source of revenue, according to research from Screen Digest. Analysts predict the broadband movie market will be worth more than £60m in the UK over the next five years. "I think that's where we'll see it really taking off – users will want super fast broadband to deliver entertainment services like broadband TV and music, and then they'll be able to tap into all the other benefits of broadband, like video conferencing and VoIP (Voice over IP)," says Dwight Doyley, CTO at InterForum.

PROLIFERATION OF DEVICES

Once people stop thinking of broadband as purely powering PC internet connectivity, it is possible to see the potential of a broadband-powered 'digital home' and begin to envisage the devices that might populate it.

Broadband capability in entertainment is currently driving the proliferation of devices as hardware developers recognise that consumers currently see the PC as a two-foot away, lean-forward device, rather than an engaging living room entertainment device.

However, consumers are already struggling under the growing number of home and portable devices – a media centre, a PC, a laptop, an iPod, a mobile phone – few of which currently share information. According to Intel research, 42 per cent of people in the UK complained that technology was crowding them out of their own houses, with one in four living rooms having more than seven technology devices².

Broadband offers the ability to transport all types of data down one pipe. As convergence in services and applications matures, and interworking between devices becomes the norm, your devices will soon handle all this data – ultimately your mobile telephone might also be your video player and your games console. As devices converge, voice will become part of the broader experience. For example, using voice annotation with your digital images will enrich a photograph by capturing the essence of the moment.

In the longer term, developers are working towards a digital home where a small number of devices meet all entertainment, communication and computing needs and the user can stream content between them.

Professor Jim Norton, writing in a personal capacity for the Broadband Stakeholder Group, says: "Within the home, a wide range of devices, both home entertainment and 'white goods' will communicate in ad-hoc, self-organising wireless networks at speeds of 70 Mbits/sec. Video cameras will link wirelessly to digital recorders. Surround sound systems will link wirelessly to their multiple loudspeakers...Relatively low speed wireless telemetry will make remote control of a wide range of household appliances the norm."

For the wealthy, the digital home is already a reality, albeit a prototype at this stage. Norton and other contributors believe, with advances in technology and increasingly competitive pricing for consumer electronics, it is likely to become accessible to the mass market in the next three to five years. >>



For Sony, for both PC sales and our network audio business, broadband is critical. But in the UK we are currently only scratching the surface of what broadband can deliver.

For broadband to grow beyond the PC, we need devices in the living room that use broadband as a service. And for that environment, video is key to success – it is the key concept for the broadband future. Speed is critical to the success of this concept and we need a fast roll-out of high bandwidth services.

What we want to do for consumers is give them a lot of choice about how they choose and view content. Say for example, having watched the recent Starsky & Hutch film, you wanted to watch the back catalogue of the original series. Currently, it's unlikely you could do that without physically going out to buy the DVD. Sony Pictures Digital Entertainment has digitally encoded its entire back catalogue and all their current catalogue of materials. We have a lot of content and a lot of hardware available, and what we need now are the platforms to deliver that content to the consumer.

We want to see an environment where businesses are creating platforms to do just that. At the moment, these platforms just aren't there. We do believe that things like peer-to-peer networks are not something a mass market are going to enjoy – they would much rather have legal platforms which provide security and support.

Home networks are also going to be massive in the broadband future. You will download all your content onto your home network and view it over a number of devices. Taking this one step further, we're showcasing products in Japan that can take the digital content from your home network and allow you to view it remotely over a portable device.

So if you saved Eastenders onto your home network when away on business, you could be in a BT Openzone and stream that content back to your portable media player from your home network.

Price is a real obstacle in broadband take-up. The huge growth in mobile phone adoption was when the market went pay-as-you-go. It's time for ISPs to become more sophisticated and provide different packages for different audience segments to grow broadband internet adoption more quickly.

We need to mutually promote the benefits of broadband to the consumer. The consumer electronics camp and the IT camp push quite different messages in different languages to consumers. We need a more united front.

We also need to improve some of the basic interfaces with the consumer, to create more sophisticated models that present consumers with content they are interested in receiving rather than pushing them towards something they might previously have purchased.

The message to the Government is that it needs to continue to work on digital inclusion and incorporate this into all its policies. The message to the telecoms companies is that the devices and content are out there, and if we can improve the network, we can bring these to the market.

We need to work together for the mutual benefit of the industry and the consumer.



“Home networks are also going to be massive in the broadband future. You will download all your content onto your home network and view it over a number of devices.”

The BBC reports that: “23 million European households will be using wireless home networks to share media content by 2009,”³³ demonstrating strong progress towards the digital home concept. But no-one is quite sure exactly what it will look like yet. “What is the centre of the digital home? Is it going to be a set-top box, a TV, a PC?” said Adrian Criddle, Business Development Manager at Intel, “That is still being mapped out.”³⁴

VOICE IN THE BROADBAND WORLD

Over the past two decades the fall in the real cost of calls, both fixed and mobile, has seen voice telephony make the shift for many consumers from a relatively costly essential service to a low cost lifestyle service with bulk-minutes deals which have increased the time people spend talking to one another.

BT Group Technology Officer Brian Levy believes we are facing the next paradigm shift in the way voice calls are made as the ubiquity of high speed internet connectivity had enabled new service providers to offer voice as an overlay application (Voice over IP) to millions of customers free or nearly so.

He says: “VoIP take up to date has been restricted as a total replacement service for traditional PSTN voice telephony. And for many users VoIP services are additional to their existing fixed or mobile service. Early adoption was restricted due partly to a lack of service ownership end to end, lack of immediacy and mobility – because of being PC based – and fears over quality and reliability.”

“But there are millions of users of services like Skype and BT Communicator and many are very happy with the free on-net services provided. Also some of these restrictions are lifting, with PC-less phones and mobile or wifi hotspot availability.”

Now as more and more mainstream service providers, including BT, are offering voice over broadband services the shift towards voice being viewed as part of a portfolio of applications available over a broadband connection is gaining momentum.

SHATTERING THE SCHEDULE

Consumers, particularly the early adopter segment, will move away from the linear schedule model that has dominated broadcast entertainment for its entire history. “People don't want to be tethered to the grey box – they want to take their digital content with them and consume it whenever and wherever they want”, says Dr Jo Twist, Senior Research Fellow, Institute for Public Policy Research (ippr).

Broadband enables this break from the broadcasters' schedules by providing archived and stored content for the consumer to access whenever they choose. In Japan and Korea broadcast TV ratings are significantly in decline as people can access and store their own content using higher speed broadband.

The disintegration of the traditional schedule will have significant consequences for advertisers and media planners, as will the ability to fast forward and rewind content. Advertising will need to work to find its role in this new, fluid world.

Brian Levy, BT Group Technology Officer, says: “Fundamental changes are underway in the way we consume broadcasting. The Personal Video Recorder (PVR) began some of the change – enabling us to shift the time we watch.”

“Now the iPod has begun to shift another dimension, that of geography. Podcasting which enables people to playback music and video recorded from broadcasting while on the move is likely to be a major new paradigm. Digital memory prices are falling rapidly and the ability to store large amounts of digital video and audio on small portable devices at reasonable cost is consequently developing at speed. My view is that people will have fixed recorders in the future which will record content from both off air and off the internet and then synchronise these at high speed with personal players for later consumption.”

PERSONALISED AND COMMUNITY CONTENT

So, what sort of content will society be consuming in the broadband future? Broadband-delivered TV offers far greater opportunities for personalised content than broadcast, which simply doesn't have the necessary degree of end user control or flexibility.

BT used Internet Protocol Television (IPTV) to deliver conference league football to team supporters as part of a six month trial to 160 households, which was hugely popular. Ultimately, broadband TV will create channels for certain small and local communities, enabling them to share content within their defined group. A Deaf person, for example, might use their broadband link for emailing and accessing support group websites and chatrooms, but through a TV community using webcams could communicate using British Sign Language face to face. >>



The penetration of consumer broadband has directly contributed to the rapid rise in popularity of music download services, both legitimate and illegal. There are now over

250 legal music download services around the world, and the digital download market is expected to account for 30 per cent of the value of the purchased music market by 2009 (source: Sony BMG). As higher throughput broadband is rolled out, first generation movie download services are now beginning to appear. In parallel, Digital Rights Management (DRM) technologies have now been developed to the point that they allow both a-la-carte and subscription-based payment models for these services, giving the consumer increased choice to suit their spending power.

While the success of some of these first generation services has undoubtedly been beyond many people's expectations, they typically deliver a very one dimensional experience, serving one content type to a specific environment or device. Blueprint believes the real opportunity exists in developing second generation entertainment platforms that deliver holistic consumer experiences across a wide range of content types, including music, movies, sport and TV to consumers while they are on the move, in their homes, in store and at live events. Not only does this make sense to the consumer, who typically already relies on specific retailers to deliver physical entertainment services today, but it also allows for a drastic simplification of the value chain, releasing margin for the reduced number of players in the system.

Blueprint is working with BT Media and Broadcast to bring such a second generation digital entertainment service layer to market. Our first instance is the new RobbieWilliams.com shop, which allows fans to discover and buy both physical and digital goods in the same place, gives members of the subscription based 'Inner Sanctum' the ability to stream exclusive videos while giving the web master one simple interface for managing and reporting for all digital assets.

While broadband and delivery platforms are key enablers to the digital entertainment experience, of equal importance is the way in which media industries license and control their content. Today, most media companies license their content on a format, territorial and channel basis. But given the global nature of online services and growing consumer expectation to access the same content through multiple channels, these established practices will need to change. At most risk are the companies that aggregate rights, as a simplified value chain will encourage rights holders to work directly with retailers.

The control of digital formats is particularly fragmented. In the case of major record labels, all insist on the use of DRM technology to limit where a consumer can copy and use a downloaded music track before they release their content to a retailer. But how will a typical iPod user react when they find they do not have the right to transfer their purchased music when they upgrade to a 5th iPod? The incompatibility between different types of DRM and digital file formats will also hinder the mass market take up of such services. Ultimately one format will dominate unless the leading players can agree on some interoperability.

Digital entertainment services will ultimately grow to be a hugely successful market, but in doing so significant value chain and technology changes can be expected in the next five years.



“The tools for digital creativity shouldn’t be priced out of the reach of some people.”

Dr Jo Twist, Institute for Public Policy Research (ippr)

“A lot of value lies in this very local and personalised content,” says Jo Twist at the ippr. “It’s really very healthy for social and community networks.”

This is particularly true for those in lower socio-economic groupings who are less likely to have internet access and for whom broadband TV can deliver real value through access to public services.

THE RISE OF THE CITIZEN PUBLISHER

Bloggers, vloggers, podcasters. A new language has sprung up for a new world of entertainment and media content, where one new blog (weblog) is created every second⁵.

The broadband future represents endless opportunities for everyday people to become content creators, breaking down dependence on the established media companies. This democratisation of the distribution of content marks the creation of the ‘citizen publisher’.

“We’ll probably all become content publishers and originators,” says Nick Hazell, European Alliance Director at Yahoo! “We see a limited chunk of content that is being produced by the big media companies, and a vast array of content that is created by the citizen publisher.”

Once again commentators have highlighted that niche, personalised content will be created as part of the broadband future, which drives a very strong value proposition for broadband, for a wide range of people.

TACKLING COMPLEXITY

So there is huge potential for growth in content, devices and a fundamental shift in how and when consumers access media and entertainment. All very exciting: but also potentially very complex for consumers.

“We must ensure that consumer electronic products such as portable media players can ‘talk to’ PC products – we must focus on aligning standards between devices and platforms so that products can appeal to everyone,” says Hitendra Naik at Intel.

For the industry, this is an essential: “The ability to sell additional or peripheral services depends on our ability to make it simple for the consumer and ensure it meets their needs. If it is a simple rewarding experience for the consumer then it will sell,” says Andrew Burke at BT.

In fact, even the European Commission is getting involved. Its Networked and Electronic Media (NEM) initiative aims to ensure that digital formats are open and work on any gadget and has developed a 10-year plan to achieve this end.

COLLABORATION

Collaboration between industries as well as interaction between devices is a key driver of success. Content providers are currently moving slowly away from sales models created for traditional broadcasters. The two sides must work more closely to create business models that can profit both sides. Over time, telephone operators and media companies will also have to work together to make interactive calls and content as simple and intuitive as possible. Unified messaging systems, which handle voice and data as objects in a single mailbox, will enable users to manage all of their communications.

Ultimately no one company will be able to deliver the whole broadband content proposition on its own. Accenture’s *Content on demand: Show me the money* report says that: “Content companies do not tend to have direct relationships with consumers or a network; telcos neither make nor understand the hits-driven entertainment business. Ultimately, the only way to make content-on-demand work is by combining robust and accessible distribution with compelling content.”⁶

PAY-AS-YOU-GO?

Cost is still seen by some as a barrier to the ultimate success of the broadband entertainment market. “It’s still prohibitive for many groups of people”, says Jo Twist at the ippr. “The tools for digital creativity shouldn’t be priced out of the reach of some people.”

The huge growth in usage of mobile phones began when service providers began introducing pay-as-you-go models. “It’s time for ISPs to become more sophisticated and provide different packages for different audience segments in order to grow broadband adoption more quickly,” says Jonathon White at Sony.

The pricing structure of content also needs to be carefully managed to ensure consumers feel it delivers value for money. Industry participants need to work together to create revenue models that meet the demands of their bottom lines as well as the needs of the consumer.

CONSUMER SUPPORT

The support network for consumers needs to be carefully considered. Many consumers will not have the technical skills required to manage what could be a complex home network. Problems may lie across industry boundaries making it difficult to identify the cause: is it a problem with my broadband connection, my home network, my service provider or my hardware?

The industry is already offering technologies that allow the consumer, service provider or network operator as appropriate to ‘look into’ the home network and identify problems remotely. With more accurate management tools under development, in the future network issues will be identified proactively and in many cases fixed before the end user is aware there has been a fault.

CONTENT PLATFORMS NEEDED

While there are massive opportunities for content and platform providers, there are also fears that these opportunities are not being capitalised upon. While devices like mobile media players have been hugely successful in Japan, in the UK market there are currently few services legally available to provide the content. “What we want to see is an environment where lots of people are creating platforms which can deliver content to devices,” says Jonathon White at Sony.

Theresa Wise, in the Media and Entertainment Practice at Accenture, says in her report *Rights Turn Ahead* that: “We’d expect the UK to be a substantial beneficiary in [content platforms] because our creative media are among the best in the world...but there have been comparatively few examples of successful exploitation in the UK...Players don’t always know what rights they own nor are they adept at valuing them.”⁷

PROTECTING YOUR CONTENT

So, the exploitation and protection of content is a key priority for the industry. And time is of the essence: commentators fear that the culture of piracy created by peer-to-peer and file-sharing networks is becoming embedded.

It needs to be easier to buy content than access it illegally or pirated content services will continue to proliferate. Security and Digital Rights Management (DRM) standards are at the core of this work. But the right balance needs to be struck.

“We need appropriate and legitimate use of DRMs – but we also need to be able to facilitate interoperability so that consumers can move their content between devices in a secure environment, while the content rights of the provider are respected,” says Antony Walker, CEO of the Broadband Stakeholder Group (BSG).

There is some concern that a focus on piracy is stifling movement into broadband content provision, allowing illegal models to steal a march on the industry. “DRM models are much harder to crack than the security on a standard DVD. The music download industry demonstrates that DRMs can work very effectively. The industry needs to forge ahead with confidence before the opportunity passes,” says Hitendra Naik at Intel.

NICK HAZELL

European Alliance Director, Yahoo!



There are boundless opportunities for broadband in the entertainment and media space. Looking at the pace of change in the past five years, we have seen some phenomenal developments and this pace will only accelerate as the market becomes more competitive.

One of the key features driving the growth of broadband internet is its ‘always-on’ capacity, which makes reaching for the PC as your reference tool so much more obvious. The adoption of wireless technologies in the home also means your internet is now available anywhere around the house – the next phase is for it to become available on something that is not a PC, your television for example.

Once people start becoming used to having always-on connectivity throughout the home,

There are hints of a backlash against the heavy control of the traditional media and the obstacles they present for the citizen publisher.

Jo Twist at the ippr provides a cautionary voice here: “Big media companies have a role to play in enabling people to be creative and providing outlets for the citizen publisher.”

A SUPPORTIVE POLICY ENVIRONMENT

The rise of the citizen publisher and the availability of tools for digital creation is a powerful revolution for the consumer. However, given the existing ‘digital divide’ in this country, where some 35 per cent don’t own a PC, society still faces a two-tier future for media and entertainment, both in the creation and the consumption of content.

While broadband-enabled TV and other access media will help engage some of these people in the digital world, many will remain excluded.

it’s likely that they will expect that sort of connectivity on their mobile phone as well. It’s also possible that some groups will have their first experience of being online through their mobile phones.

Video will be a key driver of the broadband future. To give you an idea of its potential, we already stream about 40 million music videos per month in Europe through Yahoo! Music. With more wireless connectivity and additional connectivity to other devices like the TV, then you can get into multiple streams of video at the same time for different members of the family. These services are very compelling for the consumer.

Compelling content is critical to the success of broadband. We’re very interested in the idea of the user as the publisher and believe this will be a key trend. So if I take a photograph, upload it to my photo store on the web and share it with my friends, I then become a publisher. Blogging is

Some commentators push for a more strategic approach from Government: “The Government have tended to dip in and out of the broadband debate. We’d like to see broadband as being more central to and integrated within their policies,” says Jonathon White at Sony.

But others believe it is the industry’s responsibility to create engagement with the consumer. “Government has intervened to create competition in the telecoms market. For us it’s now a case of creating compelling services from which people can see the benefit of having broadband connectivity,” says Nick Hazell at Yahoo!

CONCLUSION

Broadband represents an opportunity for entertainment and media content to be free from the constraints of the schedule and deliver really valuable personalised and community content to the market. The industry needs to act quickly to avoid losing out to global rivals but must be sure to keep the consumer with them on the journey.

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UK & IRELAND

the most obvious example of this and we are starting to see video logging as well. Ultimately, we’ll probably all become content publishers and originators. Music and video is going to become much more the realm of citizens rather than just the big media companies.

Developers of applications, services and devices need to maintain a keen sense that the uber-user is not the average user in order to ensure success in this market. While early adopters give us a good idea of what customers will want to do, many of the more mainstream consumers may not yet be ready for that level of sophistication.

Making the broadband future a reality really comes down to having compelling services that make people see the benefit in having broadband connectivity. We need to make sure that we are designing the right services that give consumers reasons for wanting to get, and keep, a broadband connection.



“Broadband needs to be brought alive for the man in the street. To really create engagement with those who are currently indifferent, it needs to be built into compelling products and services that make a difference to their daily lives.”

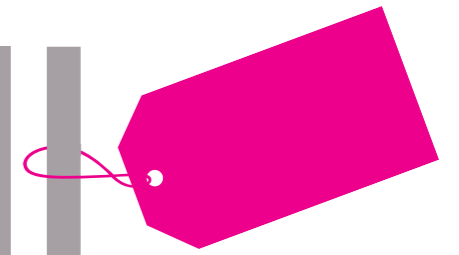


STIMULATING THE DEBATE

- Online retailing is growing significantly and the UK has one of the most favourable environments globally for e-commerce
- Broadband will drive the growth of online retail still further, but will also play a growing role in the in-store experience
- New retail business models will grow on the broadband infrastructure and as more people shop online
- Retailers need to make bigger financial and resource investments in online before they are overtaken by global competitors
- The Government needs to look carefully at promoting the UK's e-commerce sector and consider tax breaks and incentives to support the market
- The Achilles' heel of online retail, fulfilment operations, need to address their operational models to meet the demands of the broadband future.

*These are some of our contributors' views
– What do you think? Feedback at
www.bt.com/broadbandthefuture*

RETAIL



As online retailers become more sophisticated the battle for the consumer pound between bricks and mortar and internet-based retailers can only get more intense. The latest figures from the Interactive Media in Retail Group (IMRG) say that British shoppers are already spending over £1 billion online every month¹.

Broadband has a specific role driving the success of internet shopping. According to Nielsen/NetRatings research, 69 per cent of retail purchases online were conducted via a broadband connection². It found that broadband users were more likely to buy online and to spend more money.

The broadband future offers huge opportunities to consumers and retailers. This chapter examines these opportunities and the steps the industry needs to exploit them.

A GREAT FOUNDATION AND A ROSY FUTURE

Most agree the future is bright for online retailing. Heather Hopkins, Director of Research at Hitwise says, "Firms that are well prepared stand to benefit considerably from increased consumer demand for online shopping."³

Online retail operations make significant cost and efficiency savings for retailers, and enable their operations to be live 24 hours a day. And James Roper, Chief Executive of the IMRG, says Britain has one of the most favourable environments globally for online retailing. He cites the language, a favourable legal infrastructure, a sophisticated customer-support system and a well-developed merchant base as setting the scene for growth in the market.

"Today's online shopping market is certainly booming and is set to evolve dramatically over the next five years," says Michael Wilmott, Chief Executive of the Future Foundation. The Future Foundation estimates that 20 per cent of transactions in retail will happen online by 2010, worth some £60 billion per year.⁴

But online retailing isn't the only beneficiary of broadband. Broadband will enable a wide range of shopping interfaces like avatars, mobile, IPTV and, of course, high street retail outlets. James Roper at IMRG describes broadband as the "backbone" of the entire retail environment.

TRENDS DRIVING ONLINE GROWTH

So what will drive this growth in the next five years? Marcus Hickman, Managing Director of the Henley Centre, identifies a host of consumer trends in his article on page 39.

Devoting free time to leisure, rather than chores, is a clear trend. "People are increasingly time poor and congestion is becoming an increasing problem. Online retailing offers the consumer a hassle-free, easy shopping experience," says Arif Master, Commercial Controller at Zoom, the fashion portal which provides internet shopping for fashion brands such as Topshop, Evans and Warehouse.

The continuing consumer desire for value will be met by the sheer choice available online – the competitor is literally only a click away. James Roper at IMRG says, "UK consumers know that for many years retailers have enjoyed very high profit margins while providing mediocre service. They are voting with their keyboards for the convenience of shopping online which consistently gives good value and service."

The growth in internet retailing will also be powered by the very rich experience provided by video, images and animations. "Broadband makes a big difference to the concept of online retailing because it allows better quality rich media which enables the customer to see much more clearly what he is buying," says Arif Master at Zoom. Sites such as Thomas Cook Broadband allow shoppers to view videos of hotels and destinations, for example, cutting down the consumer decision-making cycle. >>





Online retailing is here to stay. Within five years, 20 per cent of transactions in retail will happen online – and an additional 40 per cent

of sales will be influenced by online. By 2010, there will be one billion deliveries a year from internet commerce. Broadband will no longer be a channel but the facilitator of commerce, its backbone, driving shopping interfaces like internet, avatars, mobile, IPTV and, of course, high street retail outlets.

Online retailing is incredibly empowering for the consumer. Released from the geographical confines of the high street, broadband opens up a whole new world of choice. The competitor is literally a click away, so if I don't like your prices or your delivery options, I can choose someone else. 24 million British consumers have already embraced online shopping – that's 90 per cent of those with credit cards.

We are fortunate that in this country we have one of the most favourable online marketplaces in the world. Not only do we have the luck of a commercial language, but we also have a highly-developed merchant base, a favourable legal infrastructure and the most sophisticated consumer support infrastructure in the world. Two-thirds of e-commerce via credit cards takes place in the UK.

Quite simply, we are more experienced than many of our global counterparts. We have been doing more online trading for longer to a bigger audience. We have successful trading rates, better profitability, lower numbers of customer complaints and better integration into wider businesses.

In my broadband future, we should be using this base to create a strong new market to underpin the economy against the decline in manufacturing under pressure from markets like China and India. We should be taking advantage of such a favourable infrastructure to create the largest e-commerce market globally.

But this opportunity is not being exploited sufficiently, either by British retailers or by the Government.

We need a much stronger advocacy job from our political representatives if we are to make a success of this opportunity. Until now there has been inconsistent support at ministerial level and no real integration of broadband into broader policy.

We need to see the Government considering tax breaks on equipment and staff training, and treating e-commerce exporters in the same way as traditional export businesses. Many businesses have difficulty in engaging with broadband and they need structured Government help to plan their investments in this space. Where is this help?

Our education system will also, in the longer term, need to take into account the shift in skills needed by workers in the retail sector. We will see more jobs in places like fulfilment and fewer in face-to-face retail customer service as retail moves online.

That's not to say that retailers themselves are doing enough. Our research shows that the investment made by consumers in purchasing the hardware and software they need to shop online actually dwarfs the investment made by retailers in their online offerings.

In fact, the consumer investment in online retailing is 60 times higher than that of the top 100 retail merchants in Britain. And of the top 100 retailers, half of that investment was being spent by seven companies. All the retailer has to do is turn up: yet not enough of them are.

Our broadband future in retailing could be very bright. Let's not miss the boat.

We can't afford to be left behind.



“It is the combined force of an integrated store, online, call centre, mail order – and even mobile – offering that will change the retail landscape”

James Thompson, Retail Week

The Future Foundation says that online retailing will also be powered by a growing band of 'silver surfers' in the virtual shopping mall. With two out of every three of those aged 55 to 64 now using the web, it says that a revolution in online shopping fuelled by the older consumer is now only five years away.⁴

NOT JUST ONLINE, BUT IN-STORE

Broadband will not only drive more of us online to shop, but also change our shopping experiences off-line. Debenhams has already been trialling fixed scanners in changing rooms which customers can use to scan a barcode and inform staff they need a different size or colour. Employees with mobile devices on the shop floor can then find an alternative.

Wireless broadband technology and digital screens will also change shelf-edge labelling. If a consignment of fruit is nearing the end of its shelf life, the digital signage relaying the price, known as "smart paper" signs, can be adjusted throughout the day to reflect a new, lower price. Broadband is changing the retail environment significantly, sometimes right in front of our eyes.

Eventually, many predict that broadband will change grocery shopping completely, even to the extent of telling us what we need to buy and ordering it online. Smart chip technology in the home, linked to a home broadband network, will track stocks of consumables and order automatically when they need replenishing.

BENEFITS BEHIND THE SCENES

Broadband will also deliver increasing value behind the scenes in the next five years. Marcus Hickman at the Henley Centre cites the example of RFID (Radio Frequency Identification) tagging in the supply chain as very beneficial for retailers, as it enables better stock management processes.

Once again, information is a key driver of success. *New Media Age* magazine says: "Recording and studying data on how your customers interact with your website enables you to serve them better."⁵ The broadband future will see an increasing ability to track and store customer data throughout their contact with a retailer, be it on or offline, and target that customer through a number of devices, be it the mobile phone, the television or the PC.

NEW RETAIL BUSINESS MODELS

The broadband future will continue to enable whole new business models in retail. The Centre for Economics and Business Research (CEBR) says that the ability to sell unwanted possessions online via eBay has increased the value of the average household's assets by £3,000 with 724,000 people in the US alone earning at least part of their income from the site.⁶

Mark Pragnell, Managing Director of the CEBR, says: "In the world of eBay-nomics, small niche traders can thrive – with access to huge national, and often global markets."

Reverse auction retail models are also a growing phenomenon. Everyone will be watching to see what comes next.

RETAILER INVESTMENT

Despite this positive outlook, the IMRG believes that not enough retailers are putting significant investment, both financially and in terms of strategic resource, into online trading. "In retail, where businesses do tend to have a strong focus on the short term, the long term strategic investment needed to build a successful online business is a big barrier to entry," says James Roper of IMRG.

IMRG research says that consumers are making more investment in the online shopping market than retailers themselves. Totting up what British consumers spend on PCs and internet access reveals an investment of £6 billion per year, with retailers investing a relatively meagre £100 million per annum on website infrastructure and development. Half of this £100 million was invested by just seven companies, with few others making a significant investment in this area.⁷

Nick Allen, Chief Executive at distance shopping expert Zendor warns that "there is a lengthy learning curve involved in online retailing for those businesses who are only used to trading via the high street"⁸. Waiting for the competition to make a move could be costly.

QUALITY OF THE OFFERING

As the broadband future offers higher bandwidths, customers are likely to be turned off by 'off-the-shelf' catalogue-style websites. According to Forrester Research, retailers will need to develop new online selling skills to appeal to the millions of broadband internet shoppers: "Broadband results in smarter, more demanding shoppers who also spend more money."⁹

Heather Dougherty, senior retail analyst at Nielsen/NetRatings in the USA, says: "Increased broadband penetration rates should encourage retailers to maximise the customer experience and rethink their online business strategies to integrate rich media into website designs and advertising campaigns."¹⁰

AN INTEGRATED APPROACH

Despite the hype around internet shopping, *Retail Week* says that retail success lies not in online or offline but in a successful combination of routes to the consumer in what they call 'multi-channel selling'.

"It is the combined force of an integrated store, online, call centre, mail order – and even mobile – offering that will change the retail landscape," says *Retail Week's* James Thompson.¹¹ >>

“Bricks and mortar retailers need to decide whether to go online or whether to try to stave off the advances in online retail with special offers or new business concepts”

Arif Master, Zoom

The convergence of data and communications channels enabled by broadband will help here. For example, Voice over IP (VoIP) could be built in as a feature of online retail sites. Nick Hazell, European Alliance Director at Yahoo!, gives the example of someone wishing to buy a fridge freezer over the internet: “I may want to speak to someone about a product, or perhaps I feel uncomfortable about placing my order on the internet. If I can click and call from that web page and have that voice experience as a part of my broader internet experience, then that adds real value for me.”

ACHILLES' HEEL

Many commentators identify fulfilment as the Achilles' heel of online retailing. If, as IMRG predicts, we are to expect one million deliveries a year from online shopping by 2010, fulfilment organisations need to be planning now to cope with these volumes of deliveries.

Arif Master at Zoom says: “There is both a big opportunity and a big challenge for fulfilment operation – they could cash in on the growth of internet shopping but they need to look carefully at whether their current operations can deliver effectively in this market.”

IMRG has identified significant avoidable inefficiencies hampering today's market, around €5 for every online transaction¹². In addition, commentators commented that the majority of current delivery models seem inappropriate for the e-commerce age. If these operations continue to limit delivery slots to the average person's working day, this will create limitations for customers on what they decide to order online.

THE ROLE OF CONSUMER CONFIDENCE

Fear of fraud is deterring UK consumers from shopping online, according to *Computer Weekly*, with more than half of the UK public afraid of becoming a victim of online crime. Its research also says that consumers do not believe online traders are doing enough to combat card fraud.¹³

Actually, these incidents as a percentage of sales are still relatively rare, according to figures from CyberSource, with the percentage of revenue lost to fraud reducing year-on-year between 2003 and 2004.¹⁴

To create confidence, retailers need to deliver reassurance and the media need to keep things in perspective: “We need to keep these problems in context in order to prevent creating a climate of fear amongst online shoppers. If we put these incidents in the context of the amount of fraud that happens in the offline marketplace, it becomes much less threatening for the consumer,” says Arif Master at Zoom.

ROLE FOR GOVERNMENT

Given the favourable market environment for online retailers, James Roper at IMRG expresses surprise at the lack of Government support for this burgeoning industry and sets out an agenda for support in his article on page 36. “The Government should be actively promoting Britain's standing as an online trading nation. There's a huge amount to play for in this space and it's extraordinary that there hasn't been better support,” he says.

Roper says that retailers need structured support to plan their investments in this space as well as appropriate tax breaks.

FROM THE HIGHWAY TO THE SUPER-HIGHWAY

While few believe the ‘death of the high street’ is imminent, James Roper at IMRG does expect the broadband future to see a change in the way town centres and shopping districts are constructed. “The face of the high street is going to change considerably,” he says, adding that local councils and planners need to take note of the projections which expect one-fifth of retail to be online by 2010.

Enteraction TV, a broadband content provider for companies such as Thomas Cook, says: “The stores which remain will be those that offer an experience...We have already started to see this happen with bookstores which house coffee bars.”¹⁵



MARCUS HICKMAN

Managing Director, Henley Centre



HenleyCentreHeadlightVision



Retail remains vibrant and fully engaged with consumers, with the high street and out-of-town centres as enduring destinations for most of the UK public. How will

this change in the future and what will be the influence of broadband?

A number of consumer trends will shape the use of broadband in retail over the next five years.

Consumers want to spend more time on the leisure experiences they enjoy and that offer ‘added-value’: retail needs to cater to this trend. Conversely, they want to spend less time on the experiences they don't enjoy, and seek speed, convenience and minimal interaction here. Three quarters of consumers view grocery shopping as a chore.

With increasingly time-pressured lives, consumers are demanding ‘on the go’ experiences. They expect longer opening hours for stores, home delivery and contact centres. Consumer mindsets are also based on no-frills, value-for-money solutions. Retailers face the challenge of delivering more in terms of quality and experience while driving down prices.

Another trend is ‘cocooning’, with consumers retreating into the home as a source of identity and security, and a focus for entertainment and consumption. Spending a lot of their free time in their home is a priority for 69 per cent. More consumption will take place in the home, with requisite rises in ordering.

Consumers are reacting to faceless mass corporations by seeking out intimate and local interactions that feel personal to them. They want more feedback on the origins of products and integrity of the supply chain. And today's super-empowered consumers are demanding a higher level of service in all their experiences. More than 60 per cent have complained about poor service in 2004.

There is a growing emphasis on appearances and many consumers expect to be able to capture images immediately. The growth of the internet and picture messaging on mobiles mean retail environments must be modern and visual.

In this consumer trend context, broadband has a significant role to play in retail, both through the in-store experience and in-home experience.

Creating a lively and fast changing in-store environment will be a point of differentiation for consumers. The use of digital signage, audio, lighting and interactive avatars are all being trialled by various brands. Equally, focussing on convenient experiences, kiosks, customer relationship management (CRM) records, data on electronic point of sales (EPOS) and wireless-based queue-busting technology represent opportunities to drive consumer buying behaviour. Queues and poor signposting in retail environments are drivers of consumer dissatisfaction.

Behind the scenes, RFID (Radio Frequency Identification) technology can improve the most common cause of consumer complaint, out of stock. Biometric identification for employees has the potential to streamline employee working practices, while centralised staff scheduling (linked to text messaging to employees) could generate efficiencies. Broadband is the ‘glue’ which binds together the store and head office, enabling retailers to create and control messaging and offers across the network.

With ‘cocooning’ growing, retailers are increasingly using the internet, text, instant messaging and video conferencing to satisfy consumers during the modes when in-store is not the required experience.

Richer online experiences are enabled by broadband technology, with contact centre dialogue on online browsing becoming more prevalent. Consumer buying behaviours will become more complicated: perhaps seeing an advertisement in the paper, visiting the store to get advice and finally making the purchase online. These complicated interactions are facilitated by broadband.

The main barriers to the take up of broadband in retail are cultural. Will retailers embrace the opportunities presented by broadband or will they remain rooted to traditional interpretations of the store?

SOCIETY AND THE ENVIRONMENT



STIMULATING THE DEBATE

- The weight of available research suggests that broadband can deliver a net positive social and environmental impact, specifically in the replacement of physical journeys with online transactions
- Broadband helps create and strengthen social and community networks and will help families separated geographically to stay in touch
- Broadband offers a massive potential for public service transformation, delivering services when and where people want them and using less tax to do so
- This potential for transformation can only be realised if we can ensure that those people most in need of public services have the digital tools needed to access them
- Work on digital inclusion needs to avoid slipping from the worthwhile into the 'worthy', and should focus on projects at a grass-roots, community level
- We need further research into the environmental impacts of broadband and all organisations need to start building broadband into their long-term planning.

*These are some of our contributors' views
– What do you think? Feedback at:
www.bt.com/broadbandthefuture*

Any report that seeks to provide a vision of a broadband future must consider the concerns of society and environment, in addition to economic benefits, to ensure this vision is sustainable. This chapter explores the environmental impact of ubiquitous broadband, and also looks more closely into the broader social consequences.

Is it possible to measure the impact of our broadband future on society and the environment? And how can the industry encourage the positive impacts and manage the negatives to ensure this can be a sustainable vision?

ASSESSING THE IMPACT OF BROADBAND ON THE ENVIRONMENT

The effects of broadband are direct – as when it allows someone to work from home instead of making a car journey to work – and indirect, such as easier access to information to help decisions on where to travel, live, relax and retire.

As with electricity and other ubiquitous products or services which underpin modern life, the indirect effects of broadband are complex and diverse, and so difficult to quantify. But more evidence is emerging on its direct benefits, much of which suggests broadband has net positive impacts.

In 2004, the sustainable development charity Forum for the Future investigated the triple bottom line impacts (economic, social and environmental) of ADSL broadband.

It concluded that broadband would cause an increase in electricity consumption, and more investment in equipment (with the ultimate generation of more waste), within communications networks, and by customers of those network services.

However, it identified many potential environmental and social benefits resulting from the use of broadband. These range from reduced transport as a result of teleworking, to substitution of electronic for physical goods, for example, a MP3 rather than a CD. The report cautioned that negative impacts were also evident, and asked for more research.

Since then, BT has published several studies on the topic, which generally conclude that broadband has significant environmental and social benefits.

The most comprehensive is a 2005 study by the not-for-profit research centre, SustainIT, which examined the triple bottom line impacts of the actnow project. This provided an accelerated roll out of broadband to over 5000 small businesses in Cornwall. The report concluded that "broadband is benefiting enterprises, individuals, the Cornish economy, society and the natural environment."

On environment, the survey revealed that many respondents felt that broadband was having positive impacts on;

- reducing the amount of paper/materials used
- reducing commuting and/or business travel
- reducing office space needs (34 per cent).

A significant minority of respondents also felt that broadband has positive impacts on the important social areas of health and safety, and employment/ promotion of women and people with disabilities/ illness. Very few respondents felt that broadband had created negative impacts.



ENERGY AND BROADBAND

The actnow survey substantiated the view that broadband is leading to increased purchase and use of computers and other equipment. However, it also noted that the effects of these changes on energy use are sometimes offset by replacement of old by newer, more energy efficient, equipment, and/or by the 10-40 times increase in bandwidth which broadband provides.

The report concluded that, for business at least, the economic benefits arising from broadband were so great that it should be seen as an eco-efficient investment.

BT also believes that over the next five years its 21st Century Network programme will remove the duplication of equipment, and thereby power consumption, currently involved in providing voice and broadband services over multiple, diverse networks.

By using combined electronics for voice services and broadband, BT's 21CN programme aims to reduce the power consumption on 100,000 pieces of equipment involved in providing these services by up to 30 per cent.

There are positive environmental impacts too from mass-market broadband associated with resource efficiencies. Downloading a song from iTunes rather than buying the CD is more resource efficient, as is e-mailing between companies as opposed to writing letters.

TRANSPORT AND CONGESTION

A recent BT report identified a number of ways in which broadband can help to reduce travel and congestion. In the case of personal travel, it highlighted ways in which broadband can support the 'soft factors' – such as workplace and school travel plans, teleworking and home shopping – which a 2004 Department of Transport study concluded could cut traffic by 2-11 per cent overall, and 4-17 per cent at peak times. The most obvious form of support is the enabling of remote working.

The UK suffers from the worst traffic congestion in Europe. But replacing just one in ten of our journeys could change all that. Current thinking revolves largely around measures which tackle the symptoms of the problem such as road widening, building new roads and congestion charging. However, we also need to look at the root cause of the issue – we are making too many journeys. Travel substitution is part of the answer.

UK and regional traffic patterns has seen an average growth of 19 per cent in the past decade. With broadband communications now available to 99.6 per cent of the population it is clear that there is significant potential to make a real impact on congestion. >>

JAMES GOODMAN

Principal Sustainability Advisor,
Business Programme, Forum for the Future



All those involved in the delivery and exploitation of broadband need to consider carefully the environmental impacts of this activity. Sustainability should be central to all development and planning

processes, but risks being marginalised as the new generation of internet infrastructure is developed.

Our research indicates that there is a mixed bag of environmental impacts of ADSL broadband usage. ADSL is more energy intensive than traditional telephony delivery and involves the installation of new equipment into the exchanges.

On the consumer side, energy usage can rise significantly. One of the major negative impacts of generic broadband is the way that broadband changes the way people use their computers. It makes internet use much more effective, but in the process leads people to use their computers for longer and often just keep them switched on permanently, day and night.

Overall then, there's a net impact on how much energy is used specifically to deliver ADSL broadband and we can probably infer that this is the case for broadband as a whole.

We need to educate users to consider the environmental impacts of their broadband usage – for example, by making sure that the marketing message is 'always available', rather than 'always on'.

The disposal of electronic equipment is also an issue to which broadband contributes. Modems, PCs and all the other hardware need to be disposed of responsibly.

Legislation is forthcoming, in the form of the Waste Electronic and Electric Directive, to manage these problems but it's time for the industry, and for consumers, to start thinking about this now.

On the positive side, opportunities exist to reduce the amount people travel through products and services like video conferencing and teleworking. We need to encourage a different approach to the way these services are marketed, highlighting their benefit to the whole of society in reducing environmental impact, as well as personal and business benefits. Climate change is still considered to be a niche concern by many businesses. BT has a job to do to help those companies break out of that niche.

We should also ensure that when policy around transport futures is created that broadband is built in, it is currently a marginal concern. ICT should be considered as equivalent to a mode of transport, and be incorporated into the planning process. Our housing market could also be developed to include broadband access in new developments in order to cut down on travel.

There has been much discussion around how broadband penetration, as part of a broader ICT infrastructure, can boost economic growth. As the evidence seems to support this, but it should be remembered that, with the economy set up the way it is, economic growth leads directly to growth in unsustainable consumption, placing more and more pressure on hard-pressed natural systems.

The environmental and climate change aspects of technology developments often come bottom of the list for many: be it the industry, Government or the consumer. This needs to change. We need to consider the environment and sustainable development as policies around ICT are developed.

“We need to educate users to consider the environmental impacts of their broadband usage.”

SUSTEL, a major European research project on teleworking, found – like almost all studies on the topic – that the practice reduces the number of commuting journeys in the short term. The project also examined the more contentious issues of whether these commute savings are offset by 'rebound' effects such as:

- Non-work travel previously undertaken as part of commuting trips.
- Use of the cars which become available for other purposes when people do not commute.
- Travel for work purposes other than commuting.
- Changes in residence to more distant locations because daily commuting is not required.

It found these impacts were significant and, in the UK, offset the commute savings by around 25 per cent in the short-medium term and possibly more in the longer term.

The transport effects are still very positive and in the medium term, the scale of any rebound effects could be reduced by measures such as road pricing.

The SUSTEL research also found most teleworkers surveyed felt they had a better work-life balance and quality of life, and there were triple benefits – summed up by one survey respondent saying:

“Travelling less = more time at home = balance of home/work priorities = less stress = better performance.”

Conferencing by video, phone or the web is more time and cost efficient than meeting in person. It improves the quality of life for those who travel frequently. In October 2004, an independent poll of BT people who use conferencing concluded that every conference call saves a minimum of 32kg of travel-related carbon dioxide emissions and a minimum of £432 per audio conference call in travel costs and time.

BT conference calls each year eliminate 296,000 face-to-face meetings, which saves the emission of 47,400 tonnes of carbon dioxide.

Taking into account additional benefits identified by survey respondents, such as more effective decision-making, and better work-life balance and other impacts, the report concluded that conferencing is creating value at least 10-15 times greater than its cost.

BROADBAND – BUILDING SOCIAL NETWORKS?

There are two million people in this country who have very low levels of social contact. Media and thought leaders have bemoaned the demise of the community for many years. Can mass-market broadband help create a better social fabric?

Many commentators believe broadband will play a big role in creating and supporting communities. “One of the social benefits of broadband is a reduction in loneliness,” says Ian Pearson, Futurologist at BT.

SustainIT surveyed ICT-enabled community centres in 2004, and found:

- Broadband does increase internet usage by almost all the organisations, and by their users in half of cases.
- Broadband does not generally result in a different pattern of usage. Rather organisations and users tend to do the things they previously did without broadband – e-mail and accessing information – more speedily and effectively.
- Most respondents felt that broadband has helped to overcome social barriers between users and had a very significant or significant impact on the community.

Research from Voice over Internet Protocol (VoIP) provider Skype supports this theory. 59 per cent of those it questioned in a survey use email, instant messaging and VoIP calls to maintain links with distant loved ones.¹

The same is true for more local links. In the pioneering Netville project run by social networks expert Professor Barry Wellman, of the University of Toronto, some members of a typical suburban housing community near Toronto in Canada were given free high-speed internet access and membership of a neighbourhood e-mail discussion group.

The study found that the wired residents knew the names of three times as many neighbours, talked regularly with twice as many local people and had been invited into the homes of many more associates, than those without.²

Many commentators also believe broadband will play a big role in family cohesion in the broadband future, particularly where families live in distant geographical locations. The monitoring services discussed in the Health chapter of this report will contribute to this. Paul Garner, Head of the Pervasive ICT Research Centre at BT, says: “Broadband will drive up the connectedness of distant

family members through providing a number of communications channels. Monitoring services in particular could help provide peace of mind for those with elderly relatives living alone.”

As VoIP develops as an application over broadband, it will change the way users interact with one another. For example, people will be able to have a conversation and simultaneously see each other via a webcam. Ian Pearson, sees networked video screens in the home being commonplace in the broadband future. “If you have a broadband-powered video conferencing screen in your living room, you can invite

distant members of your family into the living room for Christmas day,” he says.

In addition, VoIP will widen the avenues available to contact friends and family. As a VoIP number is a “virtual” personal phone number it will mean that friends, family or customers can always make contact wherever you are, whether you are on your fixed line, mobile device or PC. Additional phone numbers can also be assigned to family members so, for example, specific business calls can be routed to a separate number, to help ensure a work/life balance is maintained. >>

EDMUND KING

Executive Director, RAC Foundation for Motoring



The RAC Foundation argues that we should sometimes let broadband take the strain rather than the car or train.

Our research with the Telework Association indicates that some workers in the South East of England add four months a year to their working lives just travelling to their jobs – and spend a third of their net salary on funding the commute.

Many people spend large chunks of their working week stuck in traffic jams, or on crowded trains and buses, commuting to their employment. We believe employees and employers should consider the alternatives to a long and costly daily journey – like working from home for all, or part, of the week.

Improved telecommunications technology and affordable broadband means more motorists could cut back on some journeys creating environmental as well as social benefits.

If each employee could work from home just one day per week we would see a 20 per cent cut in traffic, equivalent to removing the school run. Employers will benefit from savings on office space and greater flexibility from home-based staff.

Our Motors or Modems study says that teleworking could significantly impact on congestion – potentially cutting the worst commuter traffic by up to 10 per cent within five years. We estimate that video and

audio conferencing could cut business travel by up to three per cent; use of information technology could cut lorry journeys by up to 16 per cent; and teleshopping could reduce car trips to the shops by five per cent.

Another of our reports, “Motoring Towards 2050”, reinforces these findings. It suggests that as well as reducing traffic congestion and improving the efficiency and quality of life for workers, teleworking can also increase workforce catchment areas, improve rural employment and promote all-inclusive working. It says that nearly 50 per cent of drivers are sympathetic to the idea of working from home and think that over half of the working population will do so by 2050.

The benefits to the economy in reduced congestion costs could be up to £1.9 billion by 2010. We want the UK government to show the same level of commitment to the concept as other national administrations – like the US. The Government should carry out more research, offer more tax-based incentives to businesses and employees who telework and appoint expert advisors to help industry implement schemes.

The Government also needs to fund publicity measures to highlight the advantages of teleworking and could develop and encourage home working by its own employees.

The e-highway has a vital role to play in curbing congestion chaos on the real highway. Let broadband take the strain rather than the car or train.



Teleworking has a number of social impacts. A European Commission research project found most respondents, “had a better quality of life through teleworking than if they had commuted to the office.”³ This includes a greater control of personal time and the opportunity to spend more time with partners and children. BT estimates that 25 per cent of the UK workforce will telework at least two days a week by 2010.⁴

These social benefits make broadband far more than a commercial or personal proposition. Ian Pearson at BT says: “The Government needs to recognise that the social value offered by broadband is something that they need to be prepared to invest in.”

ARE BROADBAND NETWORKS REALLY SOCIAL?

However, not everyone is convinced. “There is a real question over whether communications over broadband technology creates meaningful social relationships,” says James Goodman at Forum for the Future. Some point out a risk of social isolation and addiction as a result of internet usage as a counter-argument to that for social cohesion from broadband.

In China, the first clinic has opened to provide help for internet addicts. The country is suffering an ‘epidemic of internet addiction’, with up to five million people admitting they have a problem, according to Sky News⁵. While the problem in this country is not yet on this scale, mental health professionals will be watching developments closely. Psychologist Hilary Southgate says, “British psychologists have suggested that one in 200 internet users display symptoms of addiction.”⁶

Yet the Connected Lives project, run by Professor Barry Wellman to investigate social networks in the online age, concluded that heavy internet usage and consequent social isolation was only a problem for new computer users and disappeared with experience.⁷

ABUSE OF THE INTERNET

The murky side of the internet throws up a range of issues for society to address going

forward. A report produced for BT by Futerra reports a 20-fold increase in online porn in the five years to 2003⁸. Numbers of child pornography and racist sites are also growing. The Internet Watch Foundation processed 12,000 reports in the first half of 2005.⁹

Regulation and police enforcement of the internet is difficult. Each incident of abuse can involve not only the offender but a multitude of organisations involved in delivering their requests. According to Futerra, there is “very little clarity or consensus on how to tackle these issues.”

TRANSFORMING PUBLIC SERVICES

Perhaps one of the biggest social impacts broadband can have is in the delivery of public services. “There is massive potential for public service transformation”, says David Hendon, Director of Business Relations at the Department for Trade and Industry. “This is about delivering services people need, when and where they wish to access them, but also about using a smaller proportion of tax to do so.”

This report has examined the potential for transforming healthcare and education services but the e-Government unit is looking at every public service, including crime, pensions and tax. The Government set itself a target of having all public services online by 2005, and while this has happened, the quality of those services vary.

Will Perrin, Director of Strategy and Policy at the Cabinet Office e-Government Unit says: “We are transforming a delivery infrastructure created in the 1970s when many people didn’t even own a telephone – users of public services would deal with a person in an office using paper-based processes. We are re-engineering our business models to respond to the fundamental changes society is undergoing.”

It is a mammoth task. The Department for Work and Pensions alone has some 22 million customers, more than any European bank. Will Perrin says: “There are some shining examples of online public service delivery out there, such as education and healthcare, and we’re working hard on the rest.”

And there’s a big prize at the end of this public service transformation: “We can expect savings of some £70 billion if we can get government services to the same productivity level as the United States through online delivery”, says James Brathwaite, chairman of the South East England Development Agency (SEEDA).

The issue with public services online is that those who are most likely to benefit from them are also those who are least likely to have a PC to access them.

DIGITAL INCLUSION – THE WORTHY OR THE WORTHWHILE?

Access to Information and Communications Technology (ICT) can improve people’s lives, opening doors to education, jobs, entertainment and personal contacts. But many people in the UK have neither the opportunity nor the necessary skills to use the technology.

The Government’s Digital Strategy sets out its commitments to digital inclusion, building on successful initiatives including the establishment of UK Online centres and the Home Computing programme.¹⁰

“We must ensure that ‘digital’ public services are available to everyone, and especially to those who are most in need of them,” says Will Perrin at the e-Government Unit. Commentators agree that this is a worthwhile focus.

Clive Ansell, Group Strategy Director at BT, while agreeing with the importance of digital inclusion, also says that all those working in the field of digital inclusion need to be wary of crossing the boundary from the worthwhile into the ‘worthy’. He says: “We’re starting to see a push to spend public money that would effectively duplicate the investments made by cable and telecoms companies. Broadband infrastructure is becoming dangerously close to being seen as the ‘main goal’ without a full recognition of the need to justify the capability in hard commercial terms, and without enabling the skills and equipment needed to make best use of broadband.”

Ansell warns that we need to ensure that broadband meets the actual needs of those people for whom broadband technology can be most transformational, and not to focus on arbitrary benchmarks.

Ansell also believes that the most effective government intervention should be at the level of encouraging a diversity of the market. “Public entities should be trial funding software and applications that could have benefits for those at a grassroots level. The more localised community projects are, and the less they are imposed by others, the more successful they seem to be,” he says.

Initiatives such as EverybodyOnline and Switch on Shropshire (Broadplace) demonstrate the power of engaging communities in technology and broadband.

Citizens Online is committed to overcoming the digital divide and their EverybodyOnline initiative, has been working with disadvantaged communities to make digital technologies accessible and providing local people with the skills to use them. Project areas have achieved up to a seven-fold increase in internet usage over the last two years.

With PC penetration stalled at 65 per cent, and many citing a lack of perceived benefits as their reason for failing to engage with broadband, the market needs new and compelling value propositions.

Examples include cheap telephony through the internet or broadband-enabled community TV – just two of the projects being looked at by the Broadband Community Network which aims to use technology in new ways to create value for communities.

Malcolm Corbett, Director of the Broadband Community Network, says: “You can achieve a lot using a little public money and strong community involvement. These projects can be truly transformational.”

CONCLUSION

At this stage, it is difficult to clearly quantify the environmental impacts of ubiquitous broadband and arrive at an overall conclusion, although research to date suggests it delivers a net positive social and environmental impact.

As James Goodman at Forum for the Future highlights in his article on page 42, this requires organisations operating in this market to examine and integrate environmental impacts into their planning processes.

Although the social impacts are generally positive, there are some negatives in terms of internet misuse.

Professor Barry Wellman says: “Technologies themselves neither make nor break communities. Rather, they create possibilities, opportunities, challenges and constraints for what people and organisations can – and cannot – do.”¹¹

People take technology and use it for their own ends. When it comes to the environment and society, all those involved must ensure that the technology is used for positive means and that any negative consequences of its usage are carefully managed.

MALCOLM CORBETT

Community Broadband Network



The Broadband Community Network brings together over 250 organisations across the country. Many of these organisations are finding alternative

means of delivering a broadband service often where coverage is difficult. A significant number are also looking at using broadband in new ways to benefit their local communities. A wonderful example of this is the ‘Carpenters Connect’ project in Stratford in East London. This project is using innovative technology to deliver broadband through the television to 400 flats in the Carpenters Estate.

The programme delivers community-based TV services, with one of the most popular being ‘Meet the Neighbours’, featuring short slots in which new people on the estate can introduce themselves. The network has engaged with local officialdom by interviewing them about how local services are organised, creating a dialogue between the estate and the local council.

There are many positive impacts for the local community. Research shows improved community cohesion, a reduction in vandalism and crime and improved participation rates in local activities. In a recent online election for the tenant management organisation, they had a 75 per cent turnout – compared to a recent local election turnout of around 30 per cent. This project will ultimately benefit communities across the country, as the organisation has created a spin-off to help others adopt the techniques they use.

A rural project called Alston Cybermoor has created a very low cost broadband service for the local community in Alston. As well as connecting a greater proportion of older people and lone parents to the internet, it provides access to social support and work opportunities plus local broadband TV and radio services.

These projects are a wonderful testament to the power broadband has to deliver benefit at a very grassroots level. Most are funded from a mixture of public and private funding, but some 20 per cent have no funding at all. We need a more co-ordinated approach to providing funding and support to these initiatives.

We also need the bandwidth to support services and applications being developed which offer low cost solutions to small businesses and communities. For example, Skype is introducing a free video conferencing service which would be immensely useful for small businesses and communities but the current broadband infrastructure means that quality isn’t very high. We need to move rapidly towards next generation networks.

Government and industry should watch these community developments, as many of them have the potential to become big commercial ideas – the next Skype could be among these concepts. They also contribute to the Government’s digital strategy both in terms of delivery of public services, in relation to the UK as a site of ‘digital excellence’.

They also have a major impact on digital inclusion. The simple fact is that, for many, computers are very difficult to use and some will never engage with a PC. The ideas generated by our projects offer people a service that is valuable to them, like the community TV in Carpenters Connect, and acts as a bridgehead for broadband into the home. Projects across the country are experimenting with means of engagement for these people.

The broadband future must include a focus on supporting projects which can deliver real benefit at a community level in order to build on this wealth of valuable work.

“We must ensure that ‘digital’ public services are available to everyone, and especially to those who are most in need of them,”

Will Perrin, e-Government Unit



“In 2010, the idea of being tied by a cable to any kind of fixed device will be a thing of the past and broadband will be with us in the home, at work and on the move.”

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