netimperative

UK online for business

sector report
broadband britain

october 2002

features

voice

case studies

research

data

resources

introduction

Real gains have been made over the past few months in the ‘Broadband Britain’ programme - the joint government and industry plan to achieve widespread take-up of high-speed internet services by 2005.

Price cuts implemented by many ISPs in April have generated a new wave of adoption among consumers and businesses, which is vital to encourage content players to invest in broadband and get the market to a point where it is self-sustaining.

However, despite this progress, some of the same old barriers that have caused the UK to fall behind other countries are still holding back development. Rural economies, which arguably have the most to gain from the spread of broadband technology, still remain disenfranchised due to embattled infrastructure providers’ reluctance to invest in areas where they believe returns will be smaller, if not non-existent. Take-up where broadband is actually available is also still at a lower level than in many places in Europe, Asia and the US.

Incremental measures, including advertising and educational campaigns to get the message across by ISPs, will have an effect, but the Government, which itself has staked much on broadband’s success, now knows it has a major role in getting the broadband bandwagon rolling. A coherent strategy is now emerging, but only time will tell whether Broadband Britain reaches its potential.

This report looks at some of the many industry and government-led moves being put forward to increase take-up. With case studies of broadband’s use in the public sector, research, data and voice pieces from those with commercial and political stakes in its success, it provides an update on the health and future of Broadband Britain.

UK online for business is pleased to be sponsoring the netimperative Broadband Britain report.

contents

BROAD CONCERNS: Broadband Britain still hangs in the balance

by Richard Agnew

The diffusion of high-speed internet access is high on political agendas around the world, and the UK is no exception. But the creation of a 'Broadband Britain' - a brand taken on by the Government and industry to encompass aspirations for an 'information society' based on the technology - is still beset by a few, ongoing problems.

On the one hand, many of the consumers and small businesses in rural areas that were meant to benefit most from broadband, remain excluded from its deployment, while, on the other, many of those that have the technology available to them have not yet signed up thanks to high costs and a market for broadband content in the UK that remains underdeveloped.

It is without question that the take-up of broadband in the UK is rising, however, there is also no disputing that Broadband Britain remains further from realisation than its counterparts in mainland Europe, Asia and the US.

Few dispute the economic benefits Broadband Britain could bring. As well as increasing productivity for businesses by making communications more efficient, high-speed and always-on internet connectivity is seen as a major driver of e-commerce, which in turn will impact on economic growth. For consumers it opens the potential for a wide range of new, bandwidth-hungry multi-media services that previous telecoms networks could not handle, and it provides a means for the public sector to offer its services on the web and reduce costs.

Broadband has also been put forward as a means of conserving oil supplies and decreasing traffic congestion, as well as relieving other beleaguered communications networks. The argument goes that it enables more people to work from home and reduces the need for business travel, increasing imports and sidestepping congestion in previous telecommunications networks.

Its potential role in the improvement of people's lives as a communications tool is also immense.

The state of the broadband market is therefore of genuine importance to the nation and its government. Prime Minister Tony Blair, who it is claimed is "closely involved" in the progress of Broadband Britain, thrust his weight behind the programme with a speech at the Confederation of British Industry conference in November last year. At the time, he claimed that the fostering of a "knowledge economy" through the technology was one of the main government priorities.

Blair said: "We are in the early days of broadband but it has the potential…to increase productivity, enhance competitiveness and enable new markets to be reached."

So, with the anniversary of the CBI conference fast approaching, what progress has been made? In the past few months, take-up of broadband packages of consumers and businesses has taken off following widespread price cuts by many broadband ISPs in April.

Since then, BT Wholesale has claimed to be connecting three times as many users to its broadband network, and the Government has recently hinted that the landmark of 1m broadband connections could be announced by the time this report is published, although most are predicting that it will be reached by the end of the year. The Government's aim to make Britain "the most extensive and competitive broadband market in the G7 by 2005", although still sounding over-ambitious, seems a good deal more feasible than when it was stated early last year.

The free-market approach

But despite this progress over recent months, the UK is still playing catch-up. Many rural areas are still excluded from broadband access - an ongoing problem arising from BT's reluctance to upgrade local exchanges to ADSL where profits are less likely, and the reduced effectiveness of ADSL for houses and offices positioned further than about 4km from those exchanges that have been upgraded. BT's rivals, including cable operators NTL and Telewest, have also had to curb their investments in networks after becoming saddled with

mountainous debts, leading to fewer homes and businesses becoming connected.

A recently-published report, conducted for the telecoms regulator Oftel by Strategic Policy Research, and dubbed "Propelling the Broadband Bandwagon", cites lack of competition in the broadband market as a major problem: "Competition (which provides sharp incentives for efficiency and innovation) will lead to more rapid roll-out of broadband internet access by speeding investment and fomenting price rivalry… the government must make a credible commitment to allow rewards for risk-taking to be realised lest investors to keep their hands in their wallets."

This will also continue to be the case for some time, it adds: "Supply-side constraints will likely limit the rate of growth of broadband internet access to a significant extent in the future. Expansion to a mass-market service will require substantial infrastructure investments, which take time to plan and implement efficiently."

The UK government is committed to broadband expansion via the free-market route, however, the continent's leading broadband nation, Germany, relies on government intervention and the monopoly of its own telecoms giant Deutsche Telekom. In Germany, according to Nielsen//NetRatings, 39% of internet connections are made via broadband - in the UK it is just 9% (see *data*).

Meanwhile, only 1,115 out of about 5,500 exchanges in the UK have been upgraded to ADSL, and only an estimated 100 have been upgraded in the past year. The situation, which Oftel has overseen but is due to pass over to super-regulator Ofcom next year, has not served rural areas at all well. Chris Godwin, public affairs manager, IBM UK, believes that the lack of high-speed access is exacerbating problems facing rural society, when Broadband Britain should be helping the small businesses that make up the majority of enterprises outside metropolitan areas from targeting global markets and gaining other benefits.

A study recently published by the Local Futures Group on behalf of IBM says the 'knowledge economy' of which Tony Blair talks is threatening to "bypass large areas of rural Britain", whose major industries - agriculture and tourism - have already been hit by the movement of young people to cities, foot and mouth, and the worldwide downturn in the travel industry. While local services such as public transport, banking, postal services and health have declined, the report also points out: "Rural areas are currently under served by the build-out of the broadband infrastructure and seem likely to remain so if market-led solutions alone are relied upon."

Beyond availability

The second problem, at a wider level, is that many fewer consumers and businesses have bought into Broadband Britain than its equivalent programmes in the US, Europe and Asia (see *data)*. Historically, this gap has been put down to Oftel's 'light-touch' approach and its hindrance to infrastructure players looking to take on former telecoms monopoly BT on a level playing field. However, to say access is the only issue affecting take-up at a national level is to ignore the fact that at least 67% of households and 75% of businesses in the UK (a similar figure to that of the US where broadband is much more established) now have ADSL services available.

What is also generally accepted is that the market growth prompted by the price cuts in April will eventually level off unless further measures are taken. The situation is more complicated than one of purely price, and has certainly been exacerbated by a perceived lack of awareness among consumers and businesses of the benefits broadband could bring. This issue is now being tackled now through government and industry-led promotional campaigns.

However, some have argued that, at least in the consumer market, the benefits are not yet there to justify users investing £25 to £30 per month. The creation of a plethora of advanced services to be delivered over broadband networks is seen as a key element in driving take-up, yet content development is still at an early

stage. The feeling is that, while greater downloading and uploading speeds have been the main focus of ISPs' adverts so far, the offer of greater speed in itself is not enough to attract people beyond the early adopters that signed up before the April, and what some have termed the second adopters that have been successfully targeted since. The latest BT "get back in the pipe" campaign is only now addressing this issue.

Broadband Britain as a whole now seems tied into a 'chicken and egg' situation centreing on users' perceptions over the value for money of broadband subscription packages and content players' views of the take-up necessary to warrant investment.

Sandip Sarda, chairman of the Broadband Content Coalition (BCC) (see *voice*), says: "At the end of the day, it's the content that people want… but the figures for broadband take-up indicate that there is a long way to go before broadband is recognised as the 'must-have' service it has the potential to be."

This is reiterated by The Strategic Policy Research report: "The standalone applications of broadband (being able to perform current internet tasks more rapidly) do not appear to allow the service to achieve critical mass. In particular, they have not led to the widespread availability of advanced web pages." The report's inference is that merely pitching broadband as a solution for users seeing their lives drift away as pages download, and selling products because they 'go like the clappers', is not enough.

However, the understandable attitude of many potential content players is one of reluctance to commit before a penetration rate is achieved that would guarantee return on investment. Some have put the target figure as high as 30% - around 20m people - which sounds extremely unlikely to ever be reached without prices coming down to negligible levels. While this figure sounds extreme, another survey carried out earlier this year by Accenture found 71% of infrastructure companies saying: "We are going to invest or have invested heavily in the market", but 64% of content players agreeing with the statement: "We are going to wait and see what happens before we commit."

Of the relationship between content and take-up, the Strategic Policy Research document says: "Increases in the demand for broadband increase the value of broadband (as the user set expands), but increases in the value of broadband also increase the demand, resulting in creation of a positive feedback loop that could conceivably lead to higher and higher demand and increasing economic benefits."

However, adding that "broadband is currently a "niche" service it warns this kind of crticial mass is "by no means a foregone conclusion - broadband… may simply be a "niche" service that cost-effectively addresses a relatively limited… domain of economic wants."

The idea that Broadband Britain may never reach its potential is not an easy one to swallow for those with financial and political stakes in its success. As a result, it is clear that April's price cuts are only one of several approaches adopted by industry and government to gradually drag up availability and get the message across.

Action

For a start, with three quarters of businesses having access to broadband, but far less having taken it up, many ISPs are now looking at "educational campaigns" about its benefits as a means of raising interest in the current climate. Tony Harris, president of business internet services at ISP BTopenworld, disagrees that there is significant latent demand in rural areas for broadband, and argues that firms should instead focus on areas where the technology is available but not being taken up.

He says: "The reality is that 75% of businesses have access but 5% have taken it. That's something we all need to get an answer for - and it comes down to education. Most companies are paying more for the old technology than they would with the new… we also need to get across to businesses that they're more efficient, and can be more responsive to sales enquiries."

BT Retail, which is marketing a stripped-

down broadband package to its mass of telephony subscribers, has already ploughed millions into a ten-day advertising blitz dubbed 'Broadband has Landed', and similar pushes are expected from the major consumer and business ISPs this autumn.

The Government is also aware of its role in raising awareness in the business, and particularly SME, sector. Thought to be in the pipeline for October is a major promotion by the Government's UK online for business programme, which is being pitched as a key platform for encouraging small businesses to get online. The scheme, which sees advisors based across the country to provide guidance to firms wishing to use broadband, also focuses on building partnerships between public and private sector bodies to target SMEs. It is also the sponsor of this report.

More optimism about government policy on broadband seems evident after the despair of many companies about the ineffectiveness of Oftel, and what many regarded as placid recommendations put forward by the DTI-funded Broadband Stakeholders' Group last year. More radical options now being considered at governmental level include the development of a set of applications that address inefficiencies such as rights management in the broadband content supply chain and a government-backed portal for the tourism industry that showcases broadband content and creates demand for the UK application development industry.

Another idea - opposed by the BCC's Sarda and content players already narked with broadband activity by the BBC "outside its remit" - would be the creation of a £10m Channel 4-type 'broadband channel' set up to aggregate supply and demand for content.

However, a report prepared for the DTI by OC&C in June says: "The main reason for piloting The Broadband Channel is to address the risk that, under current market conditions, the UK content industry may never develop adequately. The risk is a real one." It goes on to blame the transition of major portals and ISPs from a "broad and shallow" approach to content provision, centred on advertising revenues, to a "narrow and deep" approach that limits their interest in developing applications.

Regulatory issues such as copyright, which are holding up the development of individual sectors of broadband applications, are also on the Government's radar. The Strategic Policy Research report states: "Downloading of music and video files is often cited as the "killer application" for broadband that will produce critical mass, positive feedback and service take-off, but development of these applications is currently being frustrated by the difficulty and inability therefore to resolve digital copyright problems. This is a traditional area for government involvement."

To aid rural take-up, the Government is also being pushed to aid the process of rolling out broadband networks in areas outside high demand. Many have looked to South Korea, thought to be the broadband world leader, as an example of how a high degree of direct government intervention in infrastructure roll-out can boost the market. The DTI itself is understood to have sent a reconnaissance mission to South Korea in recent months to see if it can gain any pointers on policy, with the findings due to be announced in early October.

However, much of the focus of South Korea's roll-out has been on cities where building infrastructure is more cost-effective, not on rural areas, and there has been little indication that the government here would be prepared to affect a massive U-turn on providing direct subsidies to aid the market.

Instead, it has so far focused on providing support to public-private partnerships being put in place at a regional level. One of Timms' first announcements after his appointment at the end of May, was the creation of a new network of regional broadband advisors, which will sit within Regional Development Agencies (RDAs) and guide individual schemes where local businesses can receive grants. Backed by a £30m fund from the DTI, more than half of RDAs in England have set up their own plans to provide subsidies for broadband packages for businesses situated where local exchanges have not been upgraded, through alternative tech-

nologies such as fixed wireless and satellite. One of the most recent examples includes a deal between development agency Yorkshire Forward and satellite operator Aramiska, with subsidies provided on broadband packages to 450 SMEs in the areas, half of which are in rural regions. Another programme, the ACTNOW initiative, which has seen ADSL rollout part-funded by BT, local bodies and the EU in Cornwall, is also set for expansion to other areas around the country.

Also seen as important is that the public sector uses its own massive demands for broadband services, and the weight of its own investments to stimulate the broadband market in areas where BT and other providers have been reluctant to take the commercial risk of building infrastructure. For example, if schools, hospitals, clinics and other local public services were to get together and plan long-term purchasing of broadband services, it would help reduce the perceived risk and uncertainty for providers who have held back from expanding into rural regions.

However, despite Blair admitting to the CBI last year that the Government needed to manage its role as purchaser better to have a significant impact on the availability of broadband, signs of aggregation of public sector demand have only recently started to come through. The announcement of the new regional broadband advisors in June accompanied the creation of a new team of 'procurement experts' in the Office of Government Commerce. These experts will provide advice to organisations "to enable smarter public sector buying of broadband", a perceived key factor in galvanising activity in areas outside high demand. Under the scheme, the OGC will also implement new framework agreements with technology suppliers to allow public sector organisations to skip negotiations of terms and conditions for their purchases in an attempt to increase efficiency.

Timms admitted: "There are still too many people, especially in rural areas, who cannot access affordable broadband. The new broadband unit and its network of advisors will use the public sector's spending power to boost availability and take-up in these unconnected areas." His views of broadband development can also be read later in this report (see *voice*).

If the market can be suitably stimulated, by a combination of these measures, then massive benefits can be gained. Rural economies can theoretically be revived, and the close relationship between take-up and applications development could be turned to the industry's advantage, and create a 'bandwagon-type' situation where both regenerate each other.

But the point at which the UK broadband market reaches self-sustainability still seems a way off, despite the price cuts in April and further recommendations by Oftel to force BT into wholesale price cuts. Compared to its international rivals, there is a good deal of ground to be made up.

With the industry still stuck in an underdeveloped market and relying on a governmental strategy only now showing signs of coherence, the achievement of broadband critical mass still hangs in the balance. However, the Government and commercial leaders are fully aware that failure to create a Broadband Britain is unthinkable.

Richard Agnew is technology reporter for netimperative

STEPHEN TIMMS, E-COMMERCE MINISTER

Broadband is now a regular feature of TV, newspaper and billboard advertising. We are on track to hit 1 million connections well before the end of the year. After a slow start, broadband Britain is taking shape.

Broadband has the potential to increase productivity, enhance competitiveness and enable new markets to be reached. It can help rural and remote economies - geographical location will no longer be a restriction to competing with urban rivals.

But, with this new found optimism and enthusiasm comes the realisation that there are still a large number of people, especially in rural areas, who cannot access affordable broadband.

This needs to be put right. At its most basic, broadband makes the internet a more satisfying experience: less waiting; more surfing; greater benefits. This is good news in itself.

But that's just the start. Broadband - whether it's delivered down a telephone line, through a cable TV system, satellite or terrestrial radio antenna - will play a major role in driving economic development in the UK.

Broadband will allow the smallest companies to compete on a far more level playing field with their larger competitors. And it will allow businesses to access new software and sophisticated services at the press of a button.

In order to extend this opportunity across the nation, the Government's policy has been to foster a highly competitive market to drive broadband. There are already an impressive number of different operators and technologies with cable companies supplying more than half the nation's broadband customers and over 200 resellers of BT's wholesale ADSL product.

Competition is working. Just 6 months ago, UK broadband prices were amongst the most expensive in the G7. They are now amongst the cheapest - for both cable and ADSL. With this as a foundation, subscriptions are now running at 20,000 a week - a faster take-up rate than mobile phones at an equivalent stage.

Around 66% of the population now has access to affordable broadband and 40% of households have a choice of infrastructure providers. With broadband deals for as little as £20 per month and self-install products that save time and money, broadband no longer has to be a pipe dream.

But Broadband Britain is not just about cable and ADSL. A competitive environment means that competing technologies, as well as providers, are emerging. New technologies are evolving all the time. Already, satellite broadband reaches the entire country. At the moment prices are high, but as we have seen with cable, prices will come down as the market develops. BT is currently offering wholesale asymmetric satellite broadband at £10 per month.

Wireless broadband also has enormous potential. This market is in its early stages of development but already more and more operators are working to develop networks.

With any new telecommunications provision - and broadband is no exception - there are calls for government subsidies to speed up roll-out. Past experience underpins our view that inappropriate use of taxpayers' money can distort the market and, in the long term, delay widespread availability of the most up to date services. Competition is a much more effective driver.

More competition in the longer term means more competitive pricing, more consumer choice and a faster rate of innovation. Most of us will recall the arrival of mobile phones in the 80's. Non-urban areas were poorly served and many maintained that ubiquitous coverage would only come about through placing financial incentives on providers. Today's vibrant and fiercely competitive mobile market is testament however to the success of competition.

And the Government is working hard to enhance the role of competition. The £30m fund for regional broadband projects has already seen some resounding successes. Projects range from Broadbanding Buckfastleigh - wiring up the local town hall,

hospitals, schools etc, to a demand registration site that builds the demand case in a local area and communicates this to providers. All of these projects are designed to be scaleable - so the real success stories can be repeated elsewhere.

The Government's commitment to broadband comes from the highest level. Last autumn the Prime Minister tasked the Treasury to look at what can be done to help public sector organisations buy broadband more effectively. Pioneering local authorities have already seen that aggregation of their local demand can make sense in wider value-for-money terms. Seeing that broadband can help them deliver better public services more efficiently.

As a result, we have recently announced a new broadband unit and a network of dedicated regional broadband advisors who will use the public sector's spending power to boost availability and take-up in unconnected areas. Last month's Spending Review saw the Chancellor announce almost £3bn for the development of e-services. Broadband will play a major role.

The Government is committed to creating a dynamic economy and a fair society. To me, getting Britain networked is a significant contribution to both. The UK has made a slow start, but we are turning the corner.

Broadband will become the backbone of the UK economy. Ensuring that more people and businesses can take advantage of this - regardless of where we live or the size of company we are involved in – is a major priority.

STEPHEN ROWLES, MANAGING DIRECTOR, NTL BUSINESS, RETAIL

The latest Oftel small and medium business survey offers encouraging evidence regarding the use of the internet by UK businesses. At a time when 'Broadband Britain', and especially the roll-out of high-speed internet access within the small and medium enterprise sector, has sometimes been portrayed as something of a disappointment, this is a welcome report, indicating that uptake is in fact increasing at a significant rate.

Perhaps the most striking trend revealed by this survey is that while the level of internet penetration among the UK's small and medium businesses remains fairly constant at 63%, the way in which they access the internet is changing markedly. Most notably we are seeing a shift towards unmetered access packages and faster, broadband connection methods.

1Mb broadband has the potential to offer up to 20 times the capacity of narrowband, so broadband really does have the potential to revolutionise the way small and medium sized businesses operate – delivering lightning fast, always-on, robust and low cost internet access. High-speed access is now available to a high proportion of businesses across the UK, and the industry has done much to promote not only the technology itself but also the benefits and applications it enables.

Yet many businesses have, until now, been tentative in their approach to broadband and sceptical about its benefits. In the past, high-speed access technologies such as leased lines have proved far too costly for most small businesses and, as a result, it appears many small and medium businesses felt that unreliable, metered narrowband was their only option. Given this background, the fact that the Oftel survey shows a rise in the use of unmetered internet access packages by this sector from 38% to 55% in the last quarter alone, is hugely encouraging.

And, as broadband is available to even the smallest of businesses, we will increasingly see technology delivering a more level playing field for UK businesses.

One of the report's most significant and welcome findings is the increased satisfaction with speed of internet access, from 71% in February this year to 78% in May. This can be directly attributed to increased uptake of high-speed internet access and appreciation of the benefits it brings. Word of mouth is a very powerful method of communication in this sector, so once small and medium businesses see their peers enjoying the benefits of broadband and using it to gain the competitive edge, we can expect to see added impetus across the sector.

The Government's ambitious plans to get the UK online and to roll out broadband across the country have come under close scrutiny over the last year. In early 2001, Patricia Hewitt committed us to the goal of achieving "the most extensive and competitive broadband market in the G7 by 2005". Since then, the telecoms sector has faced many tough challenges and it is clear that a lot of work must still be done in order to realise this vision.

But it is also important to remember that the internet has only been available to small and medium businesses on a commercial basis for the last 10 years. So great is the impact that the internet has made on the way we work today – from the ease of email to the inexhaustible knowledge bank of the web – that it's hard for many companies to imagine being in business without it.

Broadband is in many ways the internet's second coming and has the potential to do to the internet what the jet engine did to the performance of aeroplanes. We won't be able to build Broadband Britain overnight, but Oftel's latest report offers irrefutable evidence that the broadband ball for small and medium businesses is most definitely rolling and it's picking up pace.

Continued growth in satisfaction levels and the commitment of telecoms providers to make services more accessible and cost effective, will continue to drive the demand for broadband services, and ensure that the UK's businesses are able to derive maximum benefit.

SANDIP SARDA, CHAIRMAN, BROADBAND CONTENT COALITION

As the cost of broadband continues to come down and coverage and accessibility improves, it would seem that the Government is finally beginning to realise its goal of a Broadband Britain. Yet mass consumer take-up will not happen until it recognises that broadband is worth much more than fast, always-on access.

The real attraction for the consumer revolves around the enhanced content possibilities created by broadband. The problem is that the exciting multimedia content that broadband providers need to persuade internet users to pay monthly subscription fees does not currently exist.

The Government's broadband strategy of 'build it and they will come' is fundamentally flawed. Extended reach into rural areas and reduction in costs will not guarantee a significant rise in subscriber numbers, although these moves are to be welcomed. People will only be tempted to buy into broadband in large numbers when there is a ready availability of compelling content.

The government-appointed Broadband Stakeholder's Group has reported its findings, and it seems the Government is satisfied that it has made sufficient progress in its drive towards Broadband Britain. Yet the figures for broadband take-up indicate that there is a long way to go before broadband is recognised as the "must-have" service it has the potential to be.

The UK still lags behind a number of other countries for take-up of broadband, with 2.8% ADSL penetration compared to 12.7% in Germany. This is despite the fact that the UK has one of the highest numbers of internet users in Europe.

To reach its goal of a Broadband Britain, the Government and telcos must work closely with the content providers to ensure the development of content-based services to drive consumer interest. It could also play a significant role as a user of broadband services. The Government should seize the opportunity to lead the broadband revolution by example. One of Broadband Britain's stated goals is to bring broadband into the public sector, and the Government could potentially be one of the biggest customers of broadband services.

Yet Whitehall's Office of Government Commerce (OGC), has only just started an initiative to set up a broadband infrastructure for the public sector, and there is a proliferation of government and public sector web sites with no interactive content. If this issue is not addressed, it risks being left behind other countries in the move towards e-government.

There is huge potential for broadband in public bodies such as hospitals, schools and libraries. Broadband services that could transforms citizens lives include consultations via broadband in rural areas where travel can be difficult, and interactive patient-physiotherapist sessions that would benefit immobile patients. Ubiquitous public sector broadband would also serve to drive consumer demand, as citizens are made aware of the benefits.

The UK government is now taking a step in the right direction by urging public bodies to aggregate their broadband demand to make it financially viable. It predicts that the bandwidth requirements of all local public sector organisations, such as hospitals, councils and schools, will create sufficient demand to persuade commercial telecom suppliers who might otherwise be wary of expensive outlays.

Nevertheless, much more could be done to make sure everything is in place to attract the interest of the consumer. If this doesn't happen, the massive investment in broadband that has already been made will be wasted, and the UK will continue to lag behind the rest of Europe in the broadband stakes.

MKSCHOOLS.NET PROJECT

Background

In 2001, Milton Keynes LEA needed to build a high-speed broadband network, in line with the Government's initiative to enable each local student to have a connection to the internet and access to online educational resources by 2005. They received annual funding from the National Grid for Learning (NGfL), through membership of the East of England Broadband Consortium (E2B), to enable them to achieve this.

Back in 1997, The Open University, based in Milton Keynes, asked Networks By Wireless to connect four schools to its KMI (Knowledge Media Institute) department to enable sharing of Open University resources. These broadband connections were delivered using standard 2.4Ghz wireless LAN technology. When Milton Keynes LEA received further funding in 2001, they decided to collaborate with The Open University and use wireless technologies to fulfill their broadband connectivity objectives. Neil Roche, who has maintained the network for The Open University since 1997, has become project manager for the MKSchools.net project.

Networks By Wireless, together with partner Cable & Wireless (C&W), won the tender to implement and design the MKSchools.net network, based on Networks By Wireless' previous success working with The Open University at Milton Keynes and the predicted savings in cost and time associated with the use of wireless technology.

Objectives

The objectives for the MKSchools.net project were to connect local schools, colleges and libraries to the internet to enable Milton Keynes to become an interactive online community, meeting e-government objectives. Networks By Wireless's main involvement was during Phase One and Phase Two of this multi-phased project. To complete these phases Networks By Wireless needed to provide fast broadband links between a total of 32 local schools, colleges and libraries and to the internet. Networks By Wireless needed to implement a high-speed core infrastructure that would link a number of strategically positioned core sites throughout the Milton Keynes region. They then needed to implement last mile broadband connections of at least 2Mbps from these core sites to each school, college and library.

The rest of the project, currently at the planning stage, will be to connect all of the remaining schools and libraries in the area, which Networks By Wireless will also be involved in.

Implementation

Phase One involved the design, testing and implementation of the MKSchools.net wireless backbone and connection of the first fifteen secondary and primary schools. In Phase Two, a further seventeen junior and primary schools that fell within the footprint of the existing wireless network were connected.

Phil Taylor, programme manager at Networks By Wireless, oversaw the design, testing and installation of the MKSchools.net network. Engineers spent one month designing the network and carried out a further month of surveys before the network was installed. Feasibility surveys identified that only 5 strategically positioned sites were required to achieve the coverage required to enable the last mile wireless connections. Each of these sites is either council or C&W-owned, meaning that no third party site share costs were incurred.

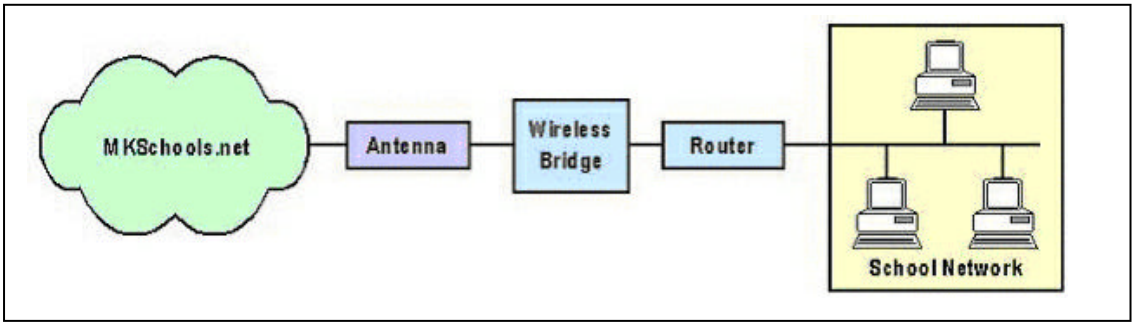
"The survey stage is where we make sure the network will function as planned, meaning we can give the customer a guarantee of its speed and performance before it is installed," said Taylor. "Occasionally buildings that are best placed to enable wireless connectivity are not Council-owned, meaning we need to seek private permission and enter into site share arrangements. For large-scale projects and where it makes financial sense, if third party site share costs are too high, we can and do in fact build towers. These become the property of our customer, who can then generate revenue themselves by renting out space to third parties and Telco's," he said. During Phase One, Networks By Wireless implemented a routed 34Mbps backbone using licensed radio technol-

ogy in a resilient ring topology to connect five core sites in the Milton Keynes region. These core sites are high points that were selected during surveys as having the best line of site to enable wireless communication with the most number of schools, colleges and libraries. At each core site, up to three 11Mbps 2.4Ghz license-exempt radio signals (ISM) were transmitted, enabling ten senior schools and five junior schools within the footprint of the radio signals to connect with broadband links to other connected schools and the internet.

To enable the schools to connect, Networks By Wireless fitted each school with an antenna (approx. A5 in size) pointing towards the core site. The cable from the antenna was brought back to a 'wireless bridge' on the school's own network, (See Fig. 1). The best place to locate the antenna and wireless bridge was discussed and agreed between Networks By Wireless' installation engineers and the school during the final stages of Networks By Wireless' surveys.

The school is responsible for providing a double 13-amp power outlet, at the agreed position of the radio bridge, and a Cat 5e data connection from the wireless bridge back to wherever the router is located. MKSchools.net provides a configured gateway router with two RJ45 interfaces, one connecting to the wireless bridge and the other connecting to the school's network.

Fig. 1



(In three instances where there is no line of sight between a core site and a school, a DSL connection through phone lines has been used)

During Phase Two, seventeen further schools, mainly primary schools, were connected to the MKSchools.net backbone in the same way as Phase One.

Benefits

The implementation of the network by Networks By Wireless has enabled Milton Keynes LEA and The Open University at Milton Keynes to connect close to 19,000 students to the MKSchools.net service so far, which is a great leap to achieving their goal of getting every student online by 2005.

At approximately £450,000 in total, the MKSchools.net wireless network is extremely cost effective. Since further funding for the MKSchools.net network was not guaranteed, Networks By Wireless has enabled Milton Keynes LEA to spend its budget wisely by investing in a network they actually own. They do not pay an annual fee for the network, as with leased lines, the only regular fees incurred are for licences and maintenance.

Wireless technology also offers faster speeds than current DSL services. With a backbone of 34Mpbs and wireless links of 11Mbps, Networks By Wireless can provide up to 4Mbps last mile connections to each school, college or library - twice as fast as the government requirement.

Furthermore, Networks By Wireless has implemented a scalable and flexible solution that can be easily upgraded should more bandwidth be required, for instance when voice or video applications are added, or used to connect even more students. This would be cost prohibitive to do with an alternative solution.

BT AND THE NATIONALSPACE CENTRE

The National Space Centre is the UK's only attraction dedicated to all aspects of space and houses hands-on activities, artefacts and education facilities previously only available in North America. Many of the exhibition areas are computer based, meaning that internet capacity is critical.

George Barnett, technical director at the National Space Centre explains how the recent installation of broadband technology has made a difference: "We previously had a 256kbps (kilobits per second) connection but now we have upgraded to an additional 4mbps (megabits per second) ADSL, which means we can operate 16 times faster. One of our exhibition galleries, Space Now, uses web-based activities that allow visitors to view up-to-date space information. Previously, we had 'throttled' the bandwidth in this area as it required continuous internet access. Now, with the new capacity, this problem is eliminated and allows visitors to view live images and video at exceptional speeds and not just text documents.

"As well as our visitors gaining rewards from the new broadband installation, the business as a whole has enjoyed the benefits. General internet access and the office network has been increased, and PC security has improved as the software updates are not such a burden to download, taking minutes instead of hours. We have been able to hold video-conferences, meeting our business communication objectives and improving our relationship with other organisations. But, more importantly, the new installation by BT has allowed the National Space Centre to present live web-casts from NASA and ESA (European Space Agency), enabling us to broadcast significant space events to a wider audience."

An example of this was the recent live webcast, hosted by BT at the National Space Centre, commemorating the 40th Anniversary of Telstar, the world's first communications satellite that sent live TV signals across the Atlantic. To celebrate the anniversary, the original link between Andover in America, Pleumeur Boudou in France and Goonhilly in Cornwall, Britain was reconnected.

A team from BT Ignite, BT's business services and solutions division, installed the broadband link. The Ignite team took TV signals from the outside broadcast team at Goonhilly and, using BT's IP (internet protocol) network, Colossus and BT's broadband connections, sent live TV pictures via the web to the National Space Centre. Visitors and school groups were invited to watch the event live via webcast. It was a celebration of an historic moment, witnessed by all present, which would not have been possible without broadband.

The Telstar live webcast is just the first in a series of exciting plans the National Space Centre has for the broadband installation: "During World Space Week, 4-10 October, we are hoping to have a live link with Dr Piers Sellars, the British born astronaut who by then will be midway through his space mission. We plan to talk to him via NASA and broadband provides us with an efficient and much cheaper connection than a direct satellite link.

"We are also aiming to host our own web site, something we could not have previously contemplated. The site will include educational games that will stimulate young minds and inspire them to take an active interest in Space. Further to this we may also provide online ticket booking facilities, information packs and possibly e-commerce offering our visitors additional ways of interacting with us."

George's list is never ending thanks to the countless possibilities the connection and BT technologies offer.

Paul Leonard, head of sponsorship at BT, says: "One of the key reasons for BT's association with the Space Centre is to inspire young minds and open them up to the excitement and fun of science and technology and the part that communication plays, not just in space exploration, but in society as a whole. We believe that it is vital that the National Space Centre has the technology enjoyed by other businesses to ensure it can bring the highest level of service to visitors."

BOB LIDDLE AND MARCONI

When Bob Liddle was forced to retire from his job with Derwentside District Council after being diagnosed with MS he felt trapped at home. However, through his determination and computer skills, he has helped to build a model online community that has transformed the lives of hundreds of others. Today, the 'Derwentside Infonet' has won awards, attracted the attention of other local authorities up and down the country and even resulted in Bob receiving an MBE from the Queen.

The Infonet is one of a number of pioneering initiatives that Derwentside District Council, in County Durham, has undertaken through ATM technology provided by telecommunications company, Marconi. In 1999, the sophistication of the Council's information infrastructure made it the UK partner and European co-ordinator for SWIFT (uSer oriented and Workflow Integrated FederaTion of service providers for the elderly), an EU-funded programme to use internet and workflow technology to support elderly and disabled people living in their own homes.

In 1995, the Council negotiated a deal with Telewest to build a high-bandwidth, optical fibre-based Municipal Area Network, based on Marconi ATM switches. The aim was to link the biggest towns in the area and provide facilities for schools and community centres that could share voice, data and video with guaranteed levels of service and quality. By 1996, the Council had become, in effect, an Internet Service Provider (ISP), offering local community centres, schools and businesses unlimited broadband access for a fixed fee. Derwentside's network now generates an annual surplus of more than £90,000 to reinvest in other Council services. Also, the communications infrastructure has attracted 16 new businesses in the last 18 months, along with a new factory that brought with it nearly 500 jobs.

A SWIFT response

SWIFT's involvement with the Derwentside Infonet has been key in taking advantage of the network's functionality and bringing to light the many ways in which broadband can serve the community.

Martin Harriman, chief marketing officer of Marconi says: "Derwentside demonstrates the potential for broadband beyond business use. An ATM network gives you high security, high reliability and high predictability. The concerns about broadband technologies like ATM have always focused on cost, but a network like Derwentside's demonstrates that it provides a very good return on investment in the medium and longer term. Also, you just can't guarantee anything close to the speed, security and reliability it affords through other means."

One aspect of the SWIFT programme being piloted in Derwentside is an appointments system. It was estimated almost 20 years ago that 100,000 person-years were being wasted across 10 European countries each year due to missed health appointments for the elderly and today, the estimate is 200,000. SWIFT also improves services by providing an interface between the elderly and the various agencies involved in their care.

The Challenges

The main challenges for the SWIFT team have been the different health and care systems in each country and interfaces between the different systems of each of the groups that combine to support the elderly and disabled.

However, Professor Nigel Harding of Health Systems Co-ordination says: "While there are longstanding barriers between the various branches of health, social and welfare services SWIFT has shown that there is a very real will on the part of the different agencies to deliver better and more co-ordinated services and that practical barriers can be broken down by systems.

The missing link

Participants in the SWIFT project are provided with a terminal in their homes, through which they can access a personal daily planner providing information on who will be visiting and when. It also allows users to cancel, amend or

add services they require by the simple click of a button.

An added benefit of SWIFT to elderly and disabled users is pictures of the faces of the people who are due to visit are available on screen, to reassure people who face the danger of bogus callers.

Derwentside District Council has already invested £1.5m to provide state of the art communications facilities for its community and, through SWIFT, has begun to build an affordable way of tackling a major social concern.

With the prospect of future services such as telemedicine, teleshopping and ever-increasing opportunities for social interaction, SWIFT, Derwentside District Council and companies like Marconi are making the future for people with limited mobility - people like Bob Liddle - a little rosier.

BROADBAND BRITAIN?
Wireless and the rural economy

Extract from 'On the Move: a Look at the Social Uses of Mobile and Wireless Communications', by the Local Futures Group, sponsored by IBM.

The extract deals with the potential of wireless broadband to boost broadband links in currently disenfranchised rural communities.

Within the UK, the knowledge-based economy is essentially a metropolitan phenomenon, dominated by London and the South East, but with regional capitals like Bristol, Manchester and Glasgow. Many rural areas are on the periphery of this activity and while there are more businesses per head of population in rural areas than urban areas, they tend to be small businesses that are more often than not unversed in the benefits that ICTs can offer them.

Rural areas are typically the least likely to be early adopters of any new network technology, given the problems of access, the economics of capital investment, and the thin customer base: it takes special innovation in finance and organisation to overcome this.

On the demand side, the dispersed populations and small businesses typical of rural areas make it difficult to develop a critical mass of skills, informed consumers and innovative end-users that can make the most of new technology supply and provide a justification for yet more investment on the supply side. Given this, the role of the public sector becomes even more crucial if rural economies are to experience improvements in their competitiveness and not fall further behind.

The public sector is the largest employer of graduates in many parts of the UK and particularly in rural areas. As such it is often the most 'knowledge-based' sector and its use of ICTs are crucial to the development of the rural economy. This activity is in part driven by the e-government targets, but these focus on electronic service delivery and while this will go some way to ending the accessibilty problems for rural households, a more profound shift in the rural economy can come from the public sector harnessing its power as an economic actor, as employer, trainer and partner, as well as purchaser of advanced services. The e-governance agenda has forced some central government agencies, probably for the first time, to be a more advanced user of ICT than the private sector - the Knowledge Network or Government Gateway are good examples of this.

In terms of broadband and other advanced ICT applications, public sector demand is crucial, particularly in areas where business demand is weak or widely dispersed. The aggregation of public sector demand - collective purchasing of e-learning applications by schools or colleges, e-procurement across councils or health authorities, is seen by many content providers as the only hope for kick-starting the market for broadband.

Where we have not yet seen this level of innovation is in mobile applications and with a few honourable exceptions, government seems to be missing a trick here. You can easily can get the score from your favourite teams sent to your mobile phone in (almost) real time, but cannot yet get accurate weather forecasts from the Met Office or bus timetabling in all areas. London Transport does offer such a service, but while this is a benefit to urban dwellers who may want to time when they leave the house in the morning, it would be even more of a boon to citizen in rural areas for whom missing the bus means the next one may be several hours (even days) away!

More than that, mobile services offer the public sector the possibility of customising services to individual preferences, something that has been talked about in e-government circles, but we have as yet seen little evidence. While emailing a PC connects you with a place, texting a mobile phone connects you with a person. We have seen some evidence of this kind of application in the run up to an election, with party supporters receiving text messages, but little in the way of personalised service delivery.

However, the success of downloadable ringing tones and logos suggest that people are willing to pay extra for personalised mobile services - traffic and transport information, weather forecasts, information on schools, booking of leisure services and so on are all public sector information services that could command a premium if personalised. Tourism services are even more amenable to personalisation and indeed are location-dependent - among the most popular tourism services are those that enable people to find the nearest restaurant, railway stations, car parks or petrol stations. According to the Economist magazine, (October 2001), in Tokyo J-Phone's J-Navi services lets users enter a phone number, address or landmark and then searches the area within a 50-metre radius, proving information on shops, restaurants, subways and so on.

It may be that local authorities in rural areas, will lead the way in mobile provision in the UK. Powys in mid-Wales succeeded in building up a reputation for pioneering work on the development of innovative ICT initiatives to support new forms of economic and social development in the countryside.

As well as being the primary employer, user of ICT services and often trainer - local authorities and other public sector institutions often have an enhanced role in rural areas simply because of the institutional 'thinness' of these localities. Whereas in urban areas there are often large numbers of employers, voluntary and community organisations and public sector institutions from leisure centres to universities, in rural areas such as mid-Wales, the public sector is more likely to be the 'major game in town.' In terms of ICT penetration and usage therefore - where the public sector goes, whether in terms of broadband applications such as e-learning (like the recently-announced Curriculum Online portal) and e-health or in terms of public sector mobile communications, others are more likely to follow.

A wireless solution?

For many of the reasons outlined above, the conventional means of accessing broadband connectivity are simply not an option at the moment for individuals and businesses in rural areas. With insufficient demand in these regions, the debt-ridden cable operators are understandably reluctant to proceed with the laying of fresh cables, while BT's roll-out of DSL faces the additional problem that connectivity speeds fall off sharply at approximately two miles from any exchange, and the connection therefore require considerable engineering and maintenance work if it is to be effective. Interactive digital TV, especially digital satellite, may in future be the medium of choice for 'hard to reach' groups and many local authorities are currently experimenting with it as a way of reaching people in their homes.

One possible solution is the installation of fixed wireless systems as a means of delivering high-speed Internet access to remote areas. Although still in its infancy when compared to cable modems and DSL, it is developing rapidly and allows operators to bypass an incumbent's control of the local loop, the source of so much controversy and anguish in the UK's telecommunications industry. The technology is a hybrid between fixed-line telephony and local wireless stations, with subscribers receiving the signal via a roof-mounted aerial that is in "line of sight" of the nearest transmitter.

Despite the promise of the technology to-date, however, government auctions for fixed wireless license have only elicited a lukewarm response from the market, and it seems that public sector intervention will be necessary if the wireless opportunity is to be realised in rural Britain.

For a more 'bottom-up'/grassroots-type approach microwave wireless may offer some hope in smaller communities as the example below demonstrates. And in the US, as in the final example in this chapter, wireless networks owned and run by their users - often with an explicitly social purpose - are springing up across the country. There, members 'lend out' their Internet access by hooking up high-speed DSL or cable modem connections to a wireless base station, which then transmits bandwidth to any nearby laptop or handheld computer.

Conclusions

Rural areas present particular challenges to public sector policymakers in the UK at the moment. The triple blows of BSE, foot and mouth and the downturn in tourism has exacerbated other, more long term decline in primary industries and heightened the need to create a more diversified and high value economy in the countryside. Given the problems of thin demand and dispersed markets - broadband solutions will almost certainly have to be publicly led, at least in part and in many areas of the UK, wireless initiatives such as those pioneered in Powys, mid-Wales, will form part of the picture.

Given the centrality of public sector institutions in the economic life of the countryside, it is to be hoped that mobile information and communications - from transport information and flood alerts to the state of footpaths - forms part of the e-governance agenda of more and more local authorities in the near future. This will of course have to be matched by high quality infrastructures of skill and business support and by a commitment to both experimentation and evaluation of ICT initiatives. But the parlous sate of many of our rural areas and the need for a step change in their economic performance suggest that the time for radical experiments is now.

i. Broadband roll-out progress

a. Roll-out

BT:

Date	No of exchanges enabled to deliver ADSL	Percentage of UK households covered by exchanges
End-May 2002	1,115	66%
End-April 2002	1,015	60%
End-March 2002	1,010	60%
End-November 2001	1,010	60%
End-September 2001	1,000	60%
End-March 2001	839	50%
End-September 2000	619	40%

KINGSTON COMMUNICATIONS:

All of Kingston's exchanges in the Hull area are now enabled to deliver ADSL.

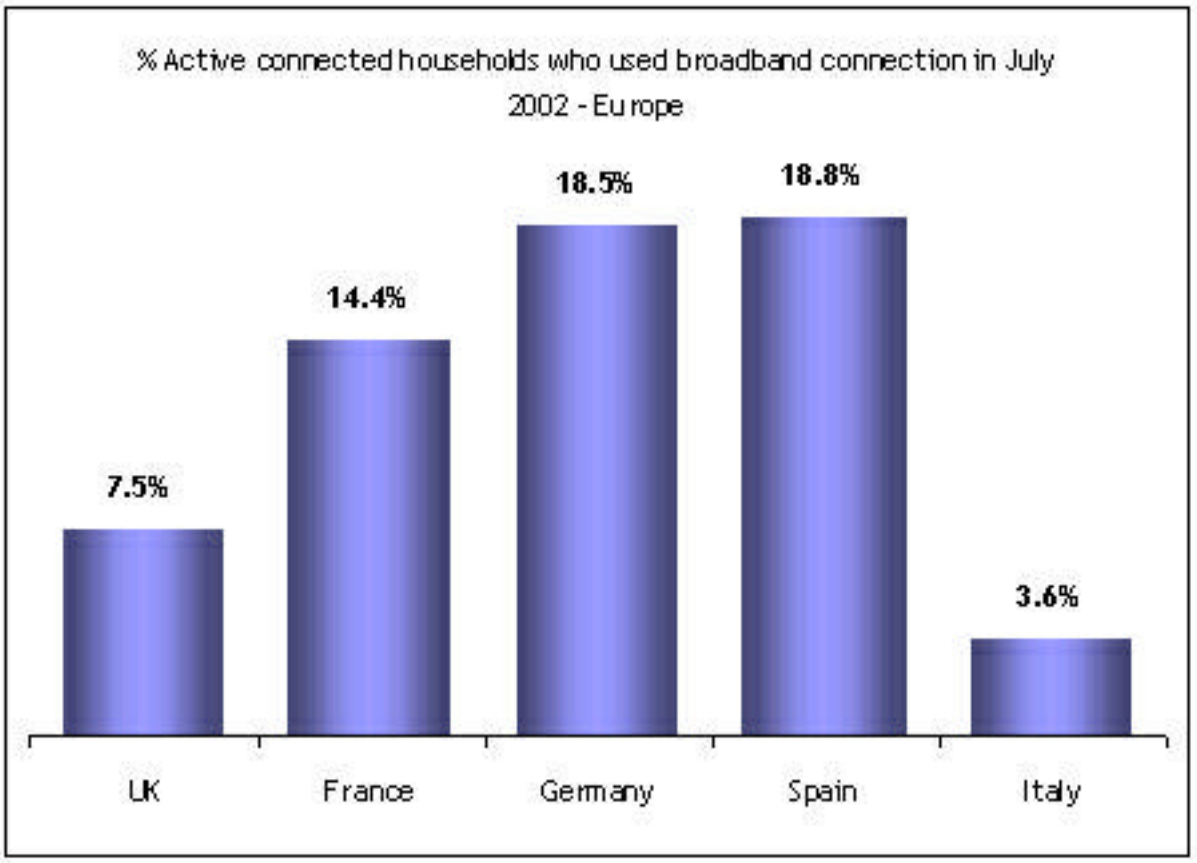
b. Take-up (as at end of July)

BT: 320,000 approx.

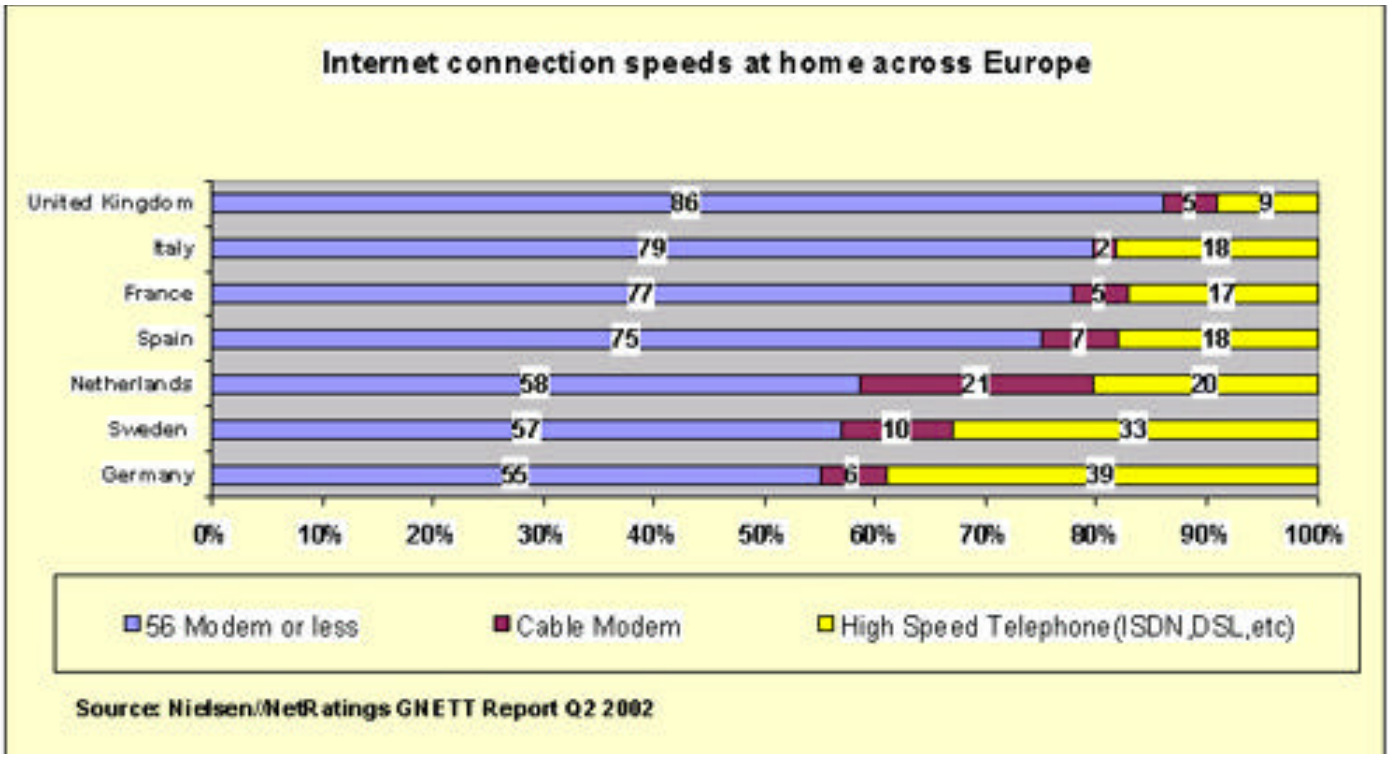
KINGSTON COMMUNICATIONS: 10,000 approx.

Source: Oftel

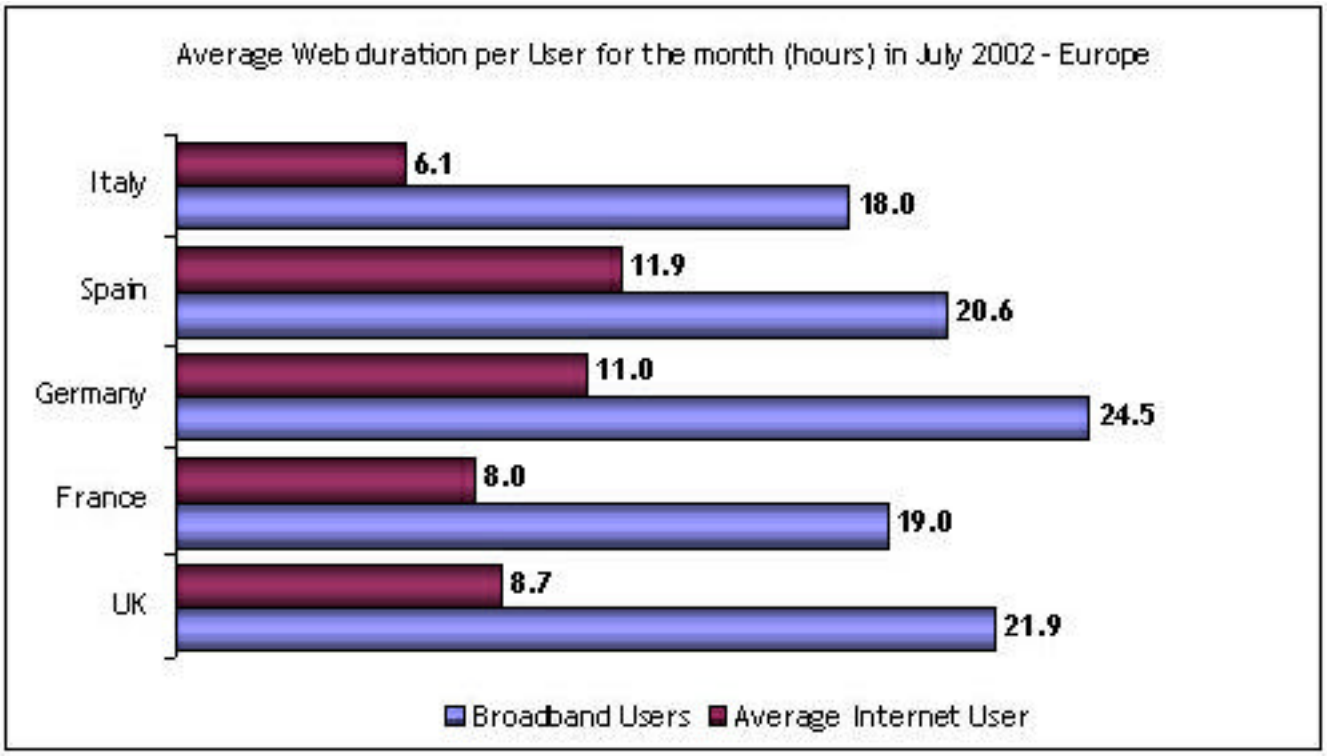
ii. Broadband penetration in the UK compared with Europe



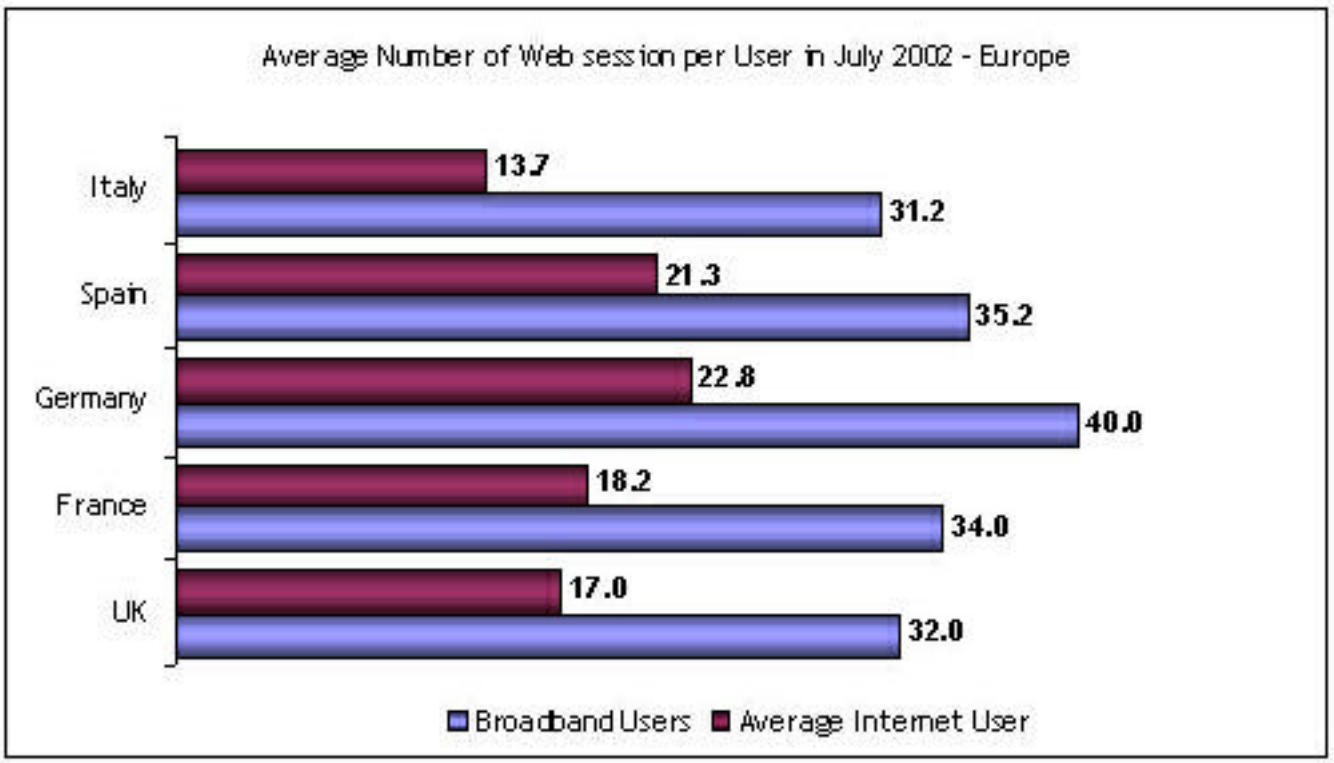
Source: Monthly Establishment Survey carried out by Taylor Nelson Sofres for NetValue



iii. Amount of web usage by broadband users



Source: NetValue



Source: NetValue

iv. Web activities: broadband users v all users

	UK broadband	UK all
Audio-video	31.2%	12.6%
Chat	19.2%	6.0%
File transfers	36.5%	11.4%
Games	6.8%	2.0%
Instant messaging	48.0%	30.3%
Mail	68.3%	51.9%
News	6.8%	2.3%
Other	54.0%	26.0%
Secured connections	87.0%	73.3%
Web	100.0%	96.3%

Source: NetValue

i. BT wholesale products

Product and launch date	Product Description	Prices (ex VAT)
VideoStream (26/5/00)	Enables operators/SPs to provide consumers with video and TV on demand services	£425-£220 connection charge (depending on volumes) £600pa rental per End User (EU)
VideoStream Plus (9/10/01)	Enables operators/SPs to provide consumers with video and TV on demand services	£50 connection charge £111pa rental per EU
DataStream S 500, 1000, 2000 (29/9/00)	Enables other operators or SPs to develop IP based networks for businesses eg. corporate intranets	£100 connection charge £610-£840pa rental per EU (depending on speed)
DataStream Home (9/10/01)	Enables other SPs to develop IP based networks for residential customers or those who work from home	£50 connection charge £111pa rental per EU
DataStream Office (9/10/01)	Enables other operators or SPs to develop IP based networks for businesses eg. corporate intranets	£50 connection charge £111pa rental per EU, regardless of speed EU
IPStream S 500, 1000, 2000 (26/5/00)	Enables other operators and SPs to provide high-speed Internet access mainly to SMEs	£260 connection charge £540-£1,020pa rental per EU (depending on speed)
IPStream 500 (29/8/00)	Entry-level version of IPStream series. Aimed at residential customers.	£210 connection charge £177pa rental per EU
IPStream Home 500 (15/1/02)	Self-install version of the IPStream 500 product	£50 connection charge £177pa rental per EU
IPStream Office 500, 1000, 2000 (15/1/02)	Self-install versions of the IPStream S products	£50 connection charge £480-£960pa rental per EU (depending on speed)
Total end users (late-June)		**~320,000**

Source: Oftel

ii. Kingston wholesale products

Product and launch date	Product Description	Prices (ex VAT)
Wholesale product **(4/10/00)**	ADSL service aimed at residential customers.	£60 installation charge £40 pm rental per EU
Total end users **(late-June)**		**~ 10,000**

Source: Oftel

iii. Technologies

ADSL:
Asymmetric Digital Subscriber Line (ADSL) technology transforms a normal telephone line into a high-speed digital line that enables access to telephony services and the Internet at the same time. ADSL provides always-on, always-available access to the Internet at speeds that are 10 to 40 times faster than a standard 56k modem. ADSL service is specific to an individual line there-fore if an end user moves address, they will need to take a new ADSL service - it cannot be transferred.

Rate Adaption:
ADSL is normally only available to those living within 3.5km of an ADSL-enabled local exchange, but this can be extended to 5.5km for rate adaptive variants of the products. Rate-adaption is achieved through relaxing the line qualification limits, enabling the upstream path (away from the End User) to rate adapt to between 64kbit/s and 250kbit/s depending on distance from the exchange and traffic levels. The downstream speed (into the End User) remains the same at up to 500kbit/s, providing continued high speed Internet downloads.

Wires-only (G.DMT):
G.DMT services are 'wires-only' variants of wholesale DSL products. BT will continue to provide the network elements, ie the wires, with the service provider supplying the end-user equipment, such as the modem. This is one step towards an 'off-the-shelf' modem/CPE product.

Self-install:
Self-install products are the step beyond G.DMT. They will enable end-users to purchase CPE 'off-the-shelf' and install it themselves, eliminating the need for engineer installations.

For regular news, features, opinion and research on the development of broadband in business, visit www.netimperative.com

URLs for companies mentioned in this report:

www.bt.com
www.telewest.com
www.telekom.de
www.ibm.com
www.localfutures.com
www.assethouse.com
www.btopenworld.com
www.actnowcornwall.co.uk
www.aramiska.co.uk
www.yorkshirefutures.com
www.ntl.com
www.networksbywireless.co.uk
www.marconi.com

Research Sources

www.dti.gov.uk
www.oftel.gov.uk
www.deloitte.co.uk
www.ukonlineforbusiness.gov.uk
www.ogc.gov.uk
www.bnsc.gov.uk
www.nielsen-netratings.com
www.netvalue.com