InfoCity @ BRISTOL ’98
Exploring Access to the Information Society

CONTENTS

The Bristol Declaration

Members of the Information Society Forum, together with participants at infoCity @ Bristol '98, assert that the principles of accessibility, affordability, cultural diversity, empowerment, equality, freedom of expression, open democracy, public service and especially freedom of information, must be at the heart of development and promotion of the Information Society.

The key to active citizenship is ACCESS - regardless of age, ability, gender, sexuality, ethnic origin, social status, income, and religious or political beliefs - to the information each person considers is needed to participate fully in society, and to opportunities to express freely ideas and opinions.

For information and communications technologies (ICT) to play an effective role in reducing the democratic deficit and creating an open, informed and informing society, everyone has to have the opportunity to share in the benefits through:

- access to awareness of the potential of the technology;
- access to appropriate training in its use;
- affordable access to the technology;
- access to the decision-making process about the ways in which the technology is applied;
- access by individuals to personal information held about themselves;
- access to systems of redress if such information is inaccurate or is used improperly.

To facilitate democratic participation:

- local and national administrations need to devise and implement coherent strategies, incorporating public consultation, to create a user-friendly infrastructure for the Information Society and, in particular, frameworks for inter-agency co-operation to simplify and improve access to public services;
- educational institutions need to develop accessible systems of service delivery which encourage everyone to make use of opportunities to gain skills and continue education throughout their lives;
- hardware and software manufacturers and information service suppliers must be encouraged to develop comprehensive, harmonised systems that are genuinely accessible by adopting design-for-all policies through the active participation of user groups. Recognising that the market approach cannot of itself guarantee social inclusion, and that many of the most innovative information and communications products come from small companies, the production and distribution of harmonised design guidelines would assist in combating some forms of social exclusion.

With the convergence of ICT it is vital that coherent and harmonised codes of ethical conduct be established, alongside provisions for copyright and data protection and protocols and technical means of assuring the reliability of information reaching the Internet.

These values and aspirations, which echo those outlined in the EC *Report People First, The Next Steps* (1997), should rank alongside the final principle of the Bonn Ministerial Conference Declaration (July 1997) that *'opportunities for becoming computer literate should be available to people of all ages and from across the social spectrum'*, and the principle of lifelong learning described in the ISF Newark Declaration (May 1998) that *'education and training is essential for the use of global information networks'.*

Bristol, Saturday 12 September 1998.

Welcome Statements

Welcome to Bristol — historic city of the future
Cllr Nikki Barton, Deputy Lord Mayor

Bristol, capital city of South West England and one of the UK's major commercial, industrial and cultural centres, is home to 400,000 people. We are a diverse community and our city has always been a centre for communications.

John Cabot sailed from Bristol to Newfoundland in the *Matthew* in 1497 and the first of the great steamships, the *SS Great Britain*, was built here in 1843. Her designer, Isambard Kingdom Brunel, was also responsible for the world's first comprehensive railway terminus here at Temple Meads and our most familiar landmark, the Clifton Suspension Bridge. Bristol was birthplace to some of the world's most innovative aircraft, from the Bristol Box Kite to the supersonic Concorde; and the Balloon Fiesta we first hosted 20 years ago is now the biggest in Europe.

Central Bristol is studded with art galleries, theatres, museums and music venues. Our flourishing cultural life includes St Paul's Carnival, the UK's largest multi-cultural event outside London, and the Bristol Community Festival, the biggest free event of its kind in Europe. The city is home to many print, production and broadcasting companies and a host of community-based media projects, as well as those working on the cutting edge of music, information and communications technology. Together we are building a city of the future based upon the City Council's core values which include Democracy, Empowerment, Equality and Public Service.

In partnership with Hewlett Packard, the University of the West of England and community groups, we are creating Digital City Bristol - an online information service for local residents and visitors. Access points are being opened all around the city to allow local citizens to obtain information, share ideas and contribute to civic life as part of our Information Technology in the Community initiative.
The Bristol Education On-line project is equipping young children with the skills they need to be active citizens of the Information Society, and literally introducing them to new worlds. We believe that projects like these will strengthen and improve not only the economic, social and cultural life of Bristol, but also enhance local democracy by encouraging equal participation for all.

We are proud to host infoCity@Bristol '98, organised by Bristol-based PressWise with support from the EC Information Society Projects Office. It is appropriate that it should take place on the weekend the replica of the *Matthew* returns to Bristol, and during our Doors Open Day which encourages public access. We hope the exhibition and conference will give everyone a glimpse of the future, and help to ensure that every European citizen can make the most of all that the Information Society has to offer.

Enjoy your stay!

Councillor Nikki Barton
Deputy Lord Mayor
Vice-Chair, Equalities & Social Justice Committee
Project Leader, Information Technology in the Community

Welcome to infoCity @ Bristol '98
Dr. Claudio Carrelli, President, EC Information Society Forum

The Information Society is perhaps the most exciting development in communications, commerce and social relationships of our age. It guarantees that the new Millennium will be very different from all that has gone before.

For almost three years representatives from consumer groups, industry and other non-governmental organisations from all over the European Union have been meeting regularly as part of the Information Society Forum.

Our task has been to explore the democratic potential of this new age and to help the European Commission to develop human-centred polices that will allow each of our societies to benefit fully from new information and communications technologies.

We have been looking at the uses to which the technology can be put, considering the complex problems that arise with each new development, and suggesting safeguards to ensure that no-one will be left behind as the Information Society takes shape. This autumn we shall be joined by colleagues from Central and Eastern Europe so that together representatives of civil society can seek to ensure that information technology works to unite us for the future.

As President of the Forum I am delighted that the City of Bristol is hosting this special event - to display some of the new ways in which information technology is being applied locally, and to debate important issues about access to the Information Society. The City Council and PressWise are to be complimented on all their efforts to increase understanding of the Information Society.

Yours is a beautiful city with an extraordinary maritime history which has linked people from all over the world. Today it is also a Media City, and an experimental centre for many innovative Information Society projects.

This conference and exhibition launches a series of similar activities all over Europe. Later this month the European Confederation of Public Relations Professionals is running a competition to seek out the best ideas from journalists for communicating developments in the Information Society. Later this year we shall be examining in more detail how local administrations are being transformed by information technology. On 21 March next year we shall hold the first European Internet Fiesta, as part of the build-up to the first European Information Society Day in May.

I hope infoCity@Bristol '98 will not just provide food for thought, but also nourish enthusiasm for the Information Society among all who take part.

Buon appetito!

Dr Claudio Carrelli
President, Information Society Forum
President, European Institute for Research & Strategic Studies in Telecommunications (EURESCOM GMBH)

[More details about European Information Society events can be obtained from the ISPO office Tel: 0800 962 114 / Fax: 00 32 2 2994170 / E-mail: ispo@ispo.cec.be]

Asserting citizens' rights in the Information Society

Mike Jempson, Executive Director of PressWise and a member of the EC Information Society Forum, explains why the UK media ethics body has organised infoCity @ Bristol '98.

At the beginning of this century, news from India took three months to reach the UK via ship. Now we accept as normal near instantaneous images from the Mir space station, and live coverage of sports anywhere in the world.

Perhaps half the world's population has yet to make a telephone call or watch TV, but we can learn that food has not got through to those starving in war-torn Sudan by means of a cell 'phone. And people in Bristol, Bratislava and Beira can communicate with and purchase goods from Boston at the press of a button.
These are phenomena of the global Information Society - brought to us by technologies which could allow the dispossessed of the world to operate on equal terms with privileged Western societies within a generation.

A few years ago the very idea of a 'fax' machine that could transmit printed words and images down a 'phone line was almost beyond belief. Today that technology has been made redundant by the Internet - putting us in touch with anyone, anywhere, at any time for the cost of a phone call - providing of course we and they have access to the right equipment and know how to use it.

But the Information Society is much more than satellite dishes, the World Wide Web, mobile phones, personal computers, games consoles, and credit cards. Even if we own none of these things we are caught up in the information explosion.

The communication revolution owes its origins to military and intelligence networks that still guard their secrets, while ours become more and more difficult to protect - which is why as citizens we need to be aware of both the potential and the pitfalls of the Information Society. Like any technology it can be a force for good or ill, for freedom or enslavement.

We may be aware of the messages about how to live, think and spend our money with which the mass media constantly bombard us, but less aware that the 'loyalty' cards doled out by supermarkets are building consumer profiles for future reference, as well as recording our every purchase to help the store restock.
Every time we fill in a form we provide someone with data which can be fed into computer systems and used to target us later with junk mail.

Information is power, and the collection of personal data by commercial organisations and public authorities can place the individual in thrall.

Ownership and control of the equipment that defines the Information Society is largely in the hands of huge international corporations. Eventually they could charge us for access to knowledge by buying the copyright of millions of books, films, recordings, and other cultural artefacts. For that reason alone some form of regulation is necessary if we are to stake a claim to citizenship in the Information Society. If this is to be a truly participative democracy, it is up to us, and our elected representatives, to ensure that everyone benefits regardless of age, sex, ethnic origin, physical or mental ability, social standing or economic power.

The Information Society is not just about crude commercial relationships. The same technology can help doctors determine what is wrong with us; support teachers in providing education; and allow us to develop real partnerships with those elected to govern or supply us with the necessities of life.

The technology can provide us with a fully integrated transport system - saving lives, protecting the environment and transforming our cities. It can bring the world closer together without putting it at

risk with unnecessary travel. It can help us share knowledge, transfer skills, and exchange cultural experiences.

We, too, can be empowered by the technology if we can persuade governments and corporations to become more open, and recognise our rights - rights to privacy, equality of access, to intellectual property, and the fruits of our own labour.
infoCity@Bristol ‘98 is both a celebration of the democratic and cultural potential of information and communication technology, and an investigation of the impediments that prevent people from taking full advantage of that potential.

We are about to witness the next great technological leap - the convergence of all forms of communication through the same digital process used by computers. At present radio and TV rely largely upon analogue transmission - wave signals which take up spectrum space and are vulnerable to atmospheric interference.
Digital transmission - where signals are first converted into digits, taking up less spectrum space and less subject to interference - will mean it is possible to transmit far more material of far higher technical quality.

In effect there will be no difference between the communication process whether you are making a phone call, drawing money from a 'hole-in-the-wall', listening to the news, watching children's TV, playing a CD, or working on a computer. Of course, we will have to have the right equipment, and know how to use it. Belonging to the Information Society does not come cheap - which is why national and local governments are examining ways of increasing communal systems of access.

PressWise was set up to defend the public's right to accurate information from the print and broadcast media, and to assist those who fall foul of irresponsible journalism. Our support for press freedom and responsibility, freedom of information and citizens' rights against abuse by the mass media extends into the digital age.

Sites of interest for virtual tourists in the Bristol area

Time and space forbade them from supplying a latterday Baedeker Guide, but Robin Askew and Eugene Byrne have selected a few local internet sites that might tickle your fancy.

Aardman Animations
www.aardman.com
The Oscar-award winning people who brought you Wallace and Gromit.

Bristol City Council
www.bristol-city.gov.uk
Useful info on council services and people as well as lots of general Bristol stuff. Site has improved greatly in recent months.

Bristol Index
www.brisindex.co.uk
Fiendishly useful. Easy-to-search business, leisure and community directory for Bristol and surrounding area run by local web design firm Linkcheck on a non-profit basis.

Bristol Ravers Directory
http://rave.ml.org/stp
Detailed guide to the (non-mainstream) club scene in and around Bristol. One of the longest-established and best among dozens of local nightclubbing and club culture websites.

Cycling in Bristol
www.gn.apc.org/cycling/index.html
Home of the Bristol Cycling Campaign. Good example of a well-run lobbying website.

Evening Post
www.epost.co.uk/index.html
The local evening paper.

Institute for Learning and Research Technology
www.ilrt.bris.ac.uk/
University of Bristol department that pioneers technological approaches to learning. Lots of interesting Internet/IT innovations for academics.

Netgates
www.netgates.co.uk
Bristol ISP, cybercafe and training establishment.

Spandex
www.spandex.co.uk
Local signmaking company whose pages combine useful business facilities with a great sense of humour - try the Gerber Time Tunnel, an interactive (though very biased) history of signmaking.

University of Bristol
www.bris.ac.uk

University of the West of England
www.uwe.ac.uk

Virtual Venue
www.venue.co.uk
Online version of Venue, the local what's on magazine, with cinema, theatre, art and live music listings, plus local features and a well-maintained local links page.

Western Daily Press
www.westpress.co.uk
Solid, reliable news site run by regional daily paper. Useful for local business information.

A 'virtual tour' of Bristol — digital city

Journalists Robin Askew and Eugene Byrne take time out from the South West's top magazine Venue *to guide us along the information superhighways of the South West.*

Bristol has always been a pioneering city technologically. Whether in the building of merchant ships or aircraft or state-of-the-art information systems, the city has never lagged behind when it comes to innovation.

In recent years, there has been a huge growth in the number and diversity of technological industries along the northern fringes of the city. British Aerospace and Rolls Royce have been joined by cutting-edge information technology companies eager to take advantage of the city's good communications and the qualified people produced by local universities.

These industries provide well-paid employment for highly skilled individuals, most of whom have moved into the area from elsewhere and will probably move on again in a few years' time. In Bristol, as elsewhere, there is some concern that huge parts of the population are being bypassed by the information revolution.
One of the most visible attempts to reach out to the widest possible public is the City Council's 'IT in the Community' initiative. This year, 21 'public access points' have been placed in libraries and community centres throughout the city. Touch-screen kiosks or multimedia personal computers give access to the Council's intranet and website and selected sites within Digital City Bristol.

Ros Mitchell, one of the councillors co-ordinating IT in the Community and herself an IT consultant, emphasises that there's much more to be done yet.

"At the moment they don't give access to very much, but I'm hoping that's going to be remedied fairly quickly. If you go into the Central Library, for example, you'll find a public access point in the foyer, a large and intimidating armour-plated box. You can get up a screen which says 'Welcome to Bristol City Council', but it's difficult to get much further."

Over the next few months the Council will be increasing the range of content, and later hopes to have 'live' links to other organisations, websites or intranets - currently opportunities to work with the Benefits Agency, other government agencies and youth organisations are under examination.

Cllr Mitchell looks forward to a far more interactive system allowing people to take problems and queries to council officials directly, or, say, view planning applications remotely and mail back comments on them. The constraining influence, as always, is money rather than the technology.

"I'd like to see these public information points in supermarkets like Tescos - with Tesco helping to pay for them," says Cllr Mitchell. "I don't think anywhere has quite got it right yet. Bristol isn't the leader, but we're certainly in the front rank. We are pioneers in using IT intelligently."

While the Council is making an honest effort to use new technologies to improve people's access to information, there are several private sector and public/private partnership organisations which are also doing exciting work that has a direct impact on the community. Here, we profile a few of them.

Digital City Bristol
www.bristol.digitalcity.org

Digital City Bristol (DCB) was set up in March 1997 to "stimulate the provision of a sustainable and visually appealing internet resource which represents the community that makes up the City of Bristol."

Modelled directly on the highly successful Digital City Amsterdam (which itself was inspired by the 'freenets' of some American cities), one of the main driving forces behind DCB was Erik Geelhoed, a psychologist at the Hewlett Packard Research Laboratories in Bristol (HPLB).

This is one of the biggest industrial research facilities in the UK, employing around 250 people. "It's more like a university type of environment than a suit-and-tie set-up," says Erik. "It's a different atmosphere, and that's what made it possible for us to get involved in the Digital City because there are no commercial spin-offs straight away. Hewlett Packard is not going to be selling digital cities."

What's in it for Erik Geelhoed is research data. "I do user studies. I look at what people want to do with all this technology. We want to find out about community computing - non-commercial uses of the Internet - so we started talking to voluntary organisations and community groups."

Visitors to the DCB website will find a huge number of local community and voluntary groups represented, far more than commercial organisations - something very unusual in any city website.

Visit DCB and you'll find a neat little gimmick; there's a big image-map of 'Bristol Harbour' which is arranged into thematic 'piers', each with 'houseboats' moored alongside. Each houseboat has a number of residents; click on a resident and you go their homepage.

Community groups and a limited number of individual citizens can become residents of DCB, free of charge. If you don't have web design skills, DCB will even design your page for you.

When it was launched as a partnership between HPLB, Bristol City Council and the University of the West of England, DCB caused a great deal of excitement. Since then, it has developed steadily, though not everyone is satisfied.

"At the moment, for example," says Erik, "It's very hard to become a member because you have to download a form, fill it in by hand, sign it, stick a floppy disk in an envelope and put it in the post. Most people can't be bothered with this long-winded process."

The good news is that DCB should be making giant strides forward very soon now. Its server is due to move from UWE to City NetGates, a local Internet Service Provider (ISP), cybercafe and training facility rolled into one.

"Because Netgates do all these things, the whole process should become a lot smoother, and we'll have online registration and so on," says Erik.

It is also hoped that DCB will become far more interactive - perhaps with chat groups, bulletin boards and so on. What's important, now, however, is that DCB becomes economically sustainable enough to develop, rather than depending on the time and goodwill of several individuals and organisations.

"At the moment it's funded by UWE, City NetGates, the Council, the Bristol Evening Post and Hewlett Packard Labs," explains Erik.

In the words of the DCB site: "The ultimate goal is to create a resource owned by a public/private sector partnership and to play a major part in the city's economic regeneration."

Cabot Software
www.cabot.co.uk

Digital TV is being hailed by many as the Holy Grail of access to the information society, producing a convergence of computer, television and telecommunications technologies.

Market penetration of the home computer, it is argued, will reach a plateau, excluding the technophobic majority from the Internet. But digital terrestrial and satellite television offers an opportunity to introduce Internet access to many millions more households without the necessity to own or even know how to operate a computer.

The set-top boxes initially necessary to receive digital signals are essentially pared-down computers, complete with 32-bit processors, a small amount of memory and a modem. As well as carrying web browsers, these can also run interactive software allowing two-way communication between broadcasters (including advertisers) and viewers.

Bristol-based Cabot Software is at the forefront of such software development.
"Internet access via digital set-top boxes is certain to introduce a large number of people to the internet, who wouldn't previously have used it because of computerphobia," says Cabot's Marketing Manager, Ian Johnson.

"How widespread this becomes depends entirely on the penetration of digital set-top boxes."

And there's the rub. Despite the BBC's high-profile enthusiasm for digital television, widespread public confusion over what it actually offers could prove to be a major problem for the industry as the latest official terrestrial digital TV launch date of 1 November looms.

Unfortunately, despite the existence of a world standards committee called DAVIC, which is responsible for resolving disputes between proponents of incompatible technologies, various digital platforms have adopted different software environments in direct competition with each other for interactive digital supremacy.

Reluctant consumers persuaded to part with £200 for a set-top box they're not convinced they need may subsequently discover that it can't deliver the interactive services they want. Little wonder the Betamax vs VHS fiasco is the analogy favoured by pessimists.

Cabot is currently in discussion with all the regional terrestrial broadcasters about introducing interactivity to their programming, although the necessary software is unlikely to be installed in the first generation of set-top boxes.

For Internet access, the company has developed the dedicated digital TV web browser NeTTV, whose universal coding allows it to work with just about any set-top box. Its other main advantage over rivals is the tiny memory requirement (just 120K). The browser can be accessed using a remote control unit similar to the existing infra-red units familiar to viewers. For a greater degree of inter-activity, alphanumeric keyboards with infra-red links to the set-top box can be used.

Using an Electronic Programme Guide, two-way communication allows viewers to download additional information from broadcasters and to interact using either the telephone network or a cable TV network's return path (placing orders for programme-related merchandise, for example). It also allows broadcasters and advertisers to gather information about viewing habits.

Further down the line, this software is likely to become even more sophisticated. One of Cabot's most recent developments is Neighbourhood Talk - an interactive community bulletin board accessed via the set-top box.

This can be customised to carry reviews and listings of local services and entertainment, including news, classified local services, cinema listings, school and library information, traffic bulletins, job advertisements, and so on, all tailored to local communities. A simple user interface allows viewers to upload contributions.
So, for example, if Tiddles the cat goes missing, it's possible to post details of the errant feline in a forum accessible to suitably equipped neighbours.

Industry predictions about the likely penetration of digital TV over the next few years vary wildly. But for those concerned about access to information, there remains a danger that the digital revolution could leave the information-poor even more impoverished.

There are an estimated 900 million television sets on the planet. Each one will require a set-top box to receive digital transmissions (the next generation of sets will come with built-in decoders).

In the UK, the government has promised that existing analogue transmissions will continue in parallel with digital broadcasts until the early years of the next decade. But those analogue frequencies are an extremely valuable commodity, and there is likely to be heavy pressure from the Treasury to sell them off to mobile telephone companies at the earliest opportunity.

The spectre of pensioners and the unemployed being left with sets that can no longer receive any transmissions at all is likely to present one of the great political challenges of the new millennium.

Footnote: Cabot Software host a free open day in Bristol entitled 'A Guide to Interactive TV' on 22 September. This is intended for broadcasters, TV production companies, advertising agencies and corporate advertisers who want to find out how to benefit from new media. Contact: ken.helps@cabot.co.uk

MEDIAworks For Business
www.mediaworks.org

Establishing a presence on the World Wide Web can be a daunting prospect for many small businesses. But with 'e-commerce' expected to take off over the coming decade, it's a market few can choose to ignore.

According to research by the International Data Corporation (http://www.idc.com), the value of internet commerce will increase tenfold to $400 billion by 2002. Finding reliable independent advice on how to make the most of the opportunities is the real challenge.

Launched last November with backing to the tune of £300,000 from the EU European Regional Development Fund, the MEDIAworks for Business Centre at the University of the West of England aims to fill the gap. Local small businesses are offered free one-to-one consultations in the use of electronic commerce and multimedia techniques, as well as help in developing their own company pages on the Digital City Bristol site.

The diverse range of industries helped over the last ten months includes multimedia production, printing and packaging, insurance, food retailing, estate agency, photography, audiocassette production, broadcasting, engineering spares, hot air ballooning and building supplies.

"The overriding aim of our programme is to ensure that West Country-based companies obtain sufficient knowledge and training to enable them to make the best business use of e-commerce and multi-media techniques," explains MEDIAworks manager Jeremy Arnold.

"Our service is totally independent, with advice, help and training being provided by experts in the areas of multimedia and e-commerce. To date we have helped over 100 organisations. In addition to the provision of help, advice and training, we also offer a web site enhancement service where we redesign existing web sites to make them more effective and interesting."

Before launching onto the Web, he says, businesses need to be clear about what they want to achieve. "How many of their customers, or potential customers, for example are online, or likely to go online. Even if you get free web space, there's no point in spending money on designing a site, getting it up there, and then find nobody's looking at it because all the people who are interested in your business are not online themselves. At the moment, the great success stories are small companies in niche markets."

The commonest mistake that small businesses make is simply to recreate their company brochures online. Then there are those who fail to capitalise upon the opportunities available to them in cyberspace.

"If you suddenly go on the World Wide Web and start to get orders from overseas, do you know how to deal with them? You've also got to have some form of procedure for how to deal with enquiries coming from the site.

"For example, have you got someone who's regularly checking for e-mail enquiries? And once they've arrived, what happens then? Have you registered your presence with all the search engines in the proper way? These are all issues that need to be addressed."

Contact: Jeremy.Arnold@uwe.ac.uk

Bristol Education Online Network (BEON)
The Bristol Education Online Network started in 1996 as a pilot project funded from government and industry contributions and run by British Telecom (BT), locally-based computer giants ICL and the local education authority.

Under the project, 11 primary and secondary schools in the Withywood area of Bristol were given computers, training and learning software. At the time, it was the largest and most important experiment in the Education Department's Super-highways Initiative.

"We've now got similar projects in Merseyside and Northumberland," explains ICL Marketing Communications Manager Alison Knott.

"But Bristol was the original project, and Withywood was chosen specifically because it was an economically-challenged area."

BEON provided each school with around 30 PCs. All are now on a network managed remotely from ICL's offices in Wakefield, thus freeing school staff from time-consuming technical chores.

ICL has also provided software geared into the National Curriculum.

"Technology is really the enabler, here," says Alison, pointing out that a major part of the project has been to train teachers in building the machines into their work.

"The key focus is that the teachers understand how it's relevant to the curriculum and how to integrate it into their classroom context. You can't just throw PC's into a classroom and expect there to be some automatic learning outcome."

So does it work? A report prepared for ICL by academics from Exeter University pointed to a whole raft of gains - improved oral and written work, significant increases in literacy, providing motivation and confidence in pupils who might come from difficult home backgrounds, and so on.

"There have been behavioural changes in a lot of students, especially in situations where there's a real threat of success," says Alison.

"For many it's uncool to be seen to be achieving - using PCs gives them the opportunity to fail and succeed."

"Anecdotally it's been a huge success," says one local education authority official.

"The teachers all want to be in on it. The problem is that we can't possibly expand it across the whole of Bristol because it's too expensive."

The best tribute to the effectiveness of BEON comes from the schools themselves. Earlier this year, all 11 schools in the scheme individually signed up to pay for the service from their own budgets. Hartcliffe School, an 800-pupil comprehensive in one of the most economically- and socially-challenged areas of the West Country, also signed up.

Hartcliffe head teacher Tony Turner told the press: "Having seen the many educational and social benefits achieved in the other participating schools, we wanted to be part of BEON. We take children from the BEON primary schools and so there will be some continuity. We anticipate significant advantages for our pupils."

Contact: ICL Education Systems, ICL House, 143 Redcliff Street, Bristol BS1 6NS. Freephone 0800 252674. Email: info@icles.com

Inter-Work
http://graduate/selbymillsmith.com

The Internet might not seem like the obvious place to start if you're a student or recent graduate looking for a career. But the Net can have distinct advantages when it comes to ensuring equality of opportunity and eliminating discrimination on grounds of gender, race or disability.

Established ten months ago by leading occupational psychologists Selby MillSmith, the Bath-based Inter-Work service provides final year under-graduates and post-graduates with an opportunity to match their skills to the requirements of many of the country's leading employers.

"For some years we've been assisting a number of corporate clients - big household name companies - to select graduates," explains director Dr. Colin Selby. "We knew they were spending several thousand pounds per place offered. Because of the cost, they tended to limit their excursions to find the right people for their company to a select number of universities.

"At the same time, we were doing a lot of work identifying competence - the sort of things that attract companies to a particular person as an employee. This entails trying to predict how somebody is going to work in a given situation by comparing them with a reference group of people who are already in that job.

"The consequence of that was that we had a dictionary of competencies that covers all the sorts of things that employers might be interested in. And as the Internet arrived, we realised that we could use it to administer questionnaires to final-year undergraduates."

So with the traditional employers' 'milk round' concentrating on an ever more narrow range of institutions, effectively excluding students who attend the less fashionable universities, the availability of at least one Internet terminal in every university department (Bath University library, for example, has 300, open 24 hours a day) means that an Internet-based system of bringing students and employers together is much more egalitarian.

The system works like this: the Inter-Work site carries a detailed interactive questionnaire which contains 190 questions that take around 30 minutes to complete. After soliciting basic biographical information, the questionnaire uses a multiple choice format to build up a psychological assessment of the potential applicant.

Because the service is funded by subscribing employers like Shell and the Kingfisher group, it is free to undergraduates, although they can request a 10-page careers guidance feedback report for

a nominal £10. Employers, meanwhile, are supplied with software allowing them to identify the profiles of people they are trying to recruit.

Lists of matches are then printed out and suitable graduates invited to apply for jobs.

City NetGates
51 Broad St, Bristol BS1 2EJ
www.netgates.co.uk

In the brief few years of its existence, City NetGates has become a very well known - even much-loved - local institution. That's because it has provided countless Bristolians, at a cost of £2.50 per half hour, with their first ever taste of the Internet.
Who knows how many machines the giant retail outlets like PC World have shifted locally as a result of love affairs with the Web born over a cup of coffee at NetGates?

But City NetGates is much more than Bristol's first (and currently only) cybercafe. If that was all it had been, it would have gone under, like a lot of other similar institutions that sprung up in the first great Internet hype of the mid-1990s.

"We anticipated that the cafe would be much busier earlier in its life and would help to support financially the development of the other aspects of our business," says owner Peter MacLellan. "This has not been realised, but use of the cafe has been rising rapidly in the last year counter to predictions of it being rapidly replaced by home access."

NetGates turns a living as an Internet Service Provider (ISP) and by offering web design and training services to businesses and individuals.

"Several cybercafes were attempted in this area but few have survived. The main reasons for failure have been poor business planning and a triumph of enthusiasm over economics. Those that were set up struggled as cafes and in most cases failed to provide fast access and good facilities for using the Internet, so they failed at that level too.

"The most successful Internet cafes do not depend just on food or Internet access income but have several other income sources such as training or web page design," explains Peter.

"Although NetGates is primarily a business ISP we established our cafe as a shop window because we believed there was a large market education exercise required and it provided the ideal vehicle.

"NetGates was established with a long term view rather than trying to exploit a short term opportunity. We have tried to respond to customer demand rather than run ahead of it and have concentrated our resources on maintaining high standards of service.

"By being involved with training and public access through the cafe, as well as the access, design and consultancy services offered to business, we have been able to understand the end users' view better, so avoiding some of the hype and gimmicks that have characterised the Internet's widespread adoption over the last three years.

"We see the Internet as a communication tool rather than a global toy."

Barriers to equality in the Information Society

In this edited version of his keynote speech at the conference, Dr Jan Van Dijk of Utrecht University queries whether in future the world will divide simply into 'information-haves' and 'information-have-nots'.

Gaps in knowledge, information and usage of technology have always existed among people, at least since the invention of writing and perhaps since the first primitive division of labour, and are very likely to remain even in advanced societies.

However, after a slow and sometimes very long introductory period, media such as the telephone, the radio, the TV, and the video-recorder have been adopted by the majority of Western populations and used in a relatively equal way.

While it is possible that a large majority of Western populations will possess a computer and a network connection within a few decades, and know how to use them, individuals will do increasingly different things with these new media.

Access to information and communications technology (ICT) is not only about possession of equipment, software and connections, but also about having the skills to use them, and the actual usage to which these resources are put.

This latter point defines the biggest barrier to full participation in the Information Society - it is possible we will see an increase in information gaps between different kinds of people.

Many people, primarily the elderly and the illiterate, find it difficult to use electrical devices in general and computers in particular. The number of people for whom first attempts may have proved negative should not be underestimated.

Results from a recent survey of so-called digital skills in The Netherlands - one of the North-Western European countries in the vanguard of using ICT - cast doubts about splendid opportunities for all via the Internet, multimedia and the information super highway.

A large proportion of 18-70 year olds admitted severe difficulties in using electronic equipment to which they have access: playing a CD (33%), using Teletext-on-TV (23%); playing back on a video-recorder (52%); programming a video-recorder (62%); making payments with a PIN-card (23%); buying a train ticket from a vending-machine (61%).

A small majority of the population (52%) claimed to be able to use a personal computer (PC), but users admitted difficulty with specific applications: word processing (54%), using spreadsheets (85%), transferring money (93%), playing computer games (81%), sending messages by e-mail (89%), looking for information on the Internet (92%).

Not being able to command a PC is felt to be a great personal shortcoming by 26% of Dutch people below 50 years of age and more than 40% of those aged over 50.
Almost everyone finds it difficult to programme a video-recorder and use PC applications, but the biggest differences showed up between the young and the old and between people with high and low educational achievement.

A significant majority (62%) of respondents believe that if you cannot use electronic equipment and smart cards you will eventually become marginalised in society.
While only 28% of the whole Dutch population expressed negative attitudes towards the ‘digitalisation’ of society, antipathy was highest among the poorly educated (66%), the unemployed (41%), and 64-70 year olds (54%).

The survey revealed that those who regard themselves as computer illiterate consider their lack of skills as a personal shortcoming. Because computers are seen as 'difficult' and they shrink from getting involved, their insecurity and fear of being excluded compounds their negative attitude towards the digital age.

Removing this first barrier might be considered just a matter of time - as the older generations die, 'computer-penetration' of society increases, and educational and computer training levels rise. Apart from being ethically unacceptable, such an assumption would also be partly incorrect.

The Dutch survey revealed that a majority of the population below the age of 50 had difficulties working on a PC, and 60% of people above that age. Yet many older people (29% of 57-63 year olds; 20% of 64-70 year olds) want to learn how to command a PC.

Supposing people did manage to get across the first threshold and were ready to use computers and the Internet - do they possess or have access to a computer or a network connection, at home, work or school? This is the barrier that dominates debate about the accessibility of the new media.

From every investigation of the social composition of computer and network users it is evident that the differences are large and permanent among most social categories. The vast majority of users are male, relatively young, well-trained, with a high or medium-sized income and originate from (an advanced region of) an affluent Western country.

A major survey among American households even showed that most of these gaps widened between 1989 and 1993.

In other words, while access to computers and networks is rising in absolute figures among all social categories, the young, the well-trained, the relatively rich and the people from affluent Western countries and regions are increasing their advantage over the old, the less well-educated, the relatively poor and the people from poor countries and regions (western and non-western).

There is only one exception: studies show that the gap in possession and access to computers and networks between males and females is narrowing.

Economists and media experts assume too easily that computers, the Internet etc. will follow a similar path to that of radio, television and other mass media of the twentieth century. In fact it is doubtful whether personal computers and computer networks will reach 90%, 80% or even 70% penetration within two or three decades.

It seems more likely that the pattern will follow that of telephone use, which took about seventy years to reach a more or less general diffusion and still is very unevenly distributed between and within Northern and Southern countries of the world.

Among the many reasons for this prediction are the facts that:

- the new media are considerably more expensive than the old ones, despite the steep decline in price of computer capacity;
- the equipment becomes obsolete much faster and new peripheral equipment and software are continually needed;
- with the development of multimedia the need for audio-visual hardware and software needed is increasing; however, they are the most costly in terms of equipment, bandwidth and intellectual property rights;
- new media are an add-on to the old media, and the element of total household budget available to spend on media and communication is not elastic, especially for those on low incomes;
- the general diffusion of old media occurred during a period of strong economic growth and levelling of incomes in the Western world; the new media have arrived in a period of a relative slackening of economic growth, individualisation, social and cultural differentiation,

increasing income differences and the rise of so-called modern poverty in Western countries;
- the diffusion of the old media was supported by universal service and public service policies promulgated by the state; the spread of new media, including the construction of information super-highways, is being left almost completely to 'the marketplace' where commercial objectives are more important than universal service and public service.

Nevertheless, it is possible that within 20 to 25 years a large majority of most Western and some Eastern-Asian populations will possess computers and networks (of varying quality and capability) in their homes or have access to them at work, at school or in public buildings.

Access is one thing, accessibility is quite another. What can the users do with these media and how will they actually use them?

Until recently personal computers and computer networks were notoriously 'user-unfriendly'. With the advent of new graphical and audio-visual interfaces and operation systems the situation has improved, but all is not yet rosy, as the Dutch survey demonstrates.

Video-recorders and personal computers are among the most popular items of electronic equipment, yet they appear to be the ones people have most difficulty with. In Holland 14% of the population would like to have a computer but have not purchased one because it is perceived as too difficult to operate; 23% of people possessing PCs do not use them for the same reason!

A broader interpretation of user-friendliness is the usage style offered. Some say that the usage style offered with the new media is not attractive to many women, the poorly educated and ethnic minorities, because it does not meet their needs and information requirements.

It would not be surprising if this proved to be the case since, according to a theory of technology as human effort, the design of new media techniques contains the traces of the social-cultural characteristics of its producers - predominantly male, well-educated, English-speaking members of the ethnic majority.

For commercial reasons the ICT-industry is seeking to improve the user-friendliness and usage style of the new media to make it more accessible. There remains the problem of lack of experience with PC-applications which in turn is caused by lacking and unequally distributed usage opportunities. This may be the most difficult barrier to remove.

Apart from their use for games applications, PCs are most often used as a form of advanced typing machine. In other words this multifunctional device is utilised far below its capacity. Applications other than word processing, computer games and, more recently, educational/reference CD-ROMs, tend to be used only by professionals for work and education.

Many home computers, purchased in subsidised private PC-projects or for the benefit of the children are simply left unused. Published figures of the sales of hardware and software everywhere show steep upward lines, yet in America studies have shown that 11% of PC owners put their computers away between 1989 and 1993 because they were not using them; and 21% of Americans who claimed to have access to the Internet in 1995 were not connected a year later.

Meanwhile professional usage opportunities at work or at school are increasing so rapidly that many users (20-30% of western populations) get the impression they cannot catch up. New versions of applications are available before the old ones have been mastered.

Those who have nothing to do with computers in education or occupation are unlikely to use them at their own initiative. The only exception is parents of children attending school - among the most important purchasers of home computers - who give themselves the opportunity to learn how to use a computer, often with the help of their children who also benefit.

Close analysis of home computer-use data from America reveals that college graduates make more use of their home computer for business or work than people without a college education, for whom entertainment/games uses predominate.

This is what is meant by a usage gap - and it is likely to grow rather than decline with a larger distribution of computers among the population. If true, the difference between advanced and simple uses would increase.

Let us assume that the first three barriers wither away in time and as the technology improves. This does not overcome the final problem - a potential increase in the existing differences in usage. Why should a technology, so well suited to spreading information, in practice lead to more private appropriation and greater inequality in usage?

Similar contradictions can be seen in other aspects of the Information Society, for instance the protection of authors' rights, copyright, and safety of payments, and the right of privacy.

The difficulty of providing such protections in digital environments is both an expression of the spread of information throughout society and the desire to keep it into one's own hands.

The former tendency is technologically supported by the ease of registration and copying by digital media. However, in Western societies there are a number of strong counter-tendencies supporting private appropriation.

The first is social-cultural. The computer is, pre-eminently, a device used by individuals but which is also able to connect individuals in groups and communities by networks.

So, increasing information inequality might just be an aspect of general social-cultural differentiation in society. However this must also be seen in the context of a second tendency - rising material inequality and differences of incomes perceivable in all Western countries since the early 1980s.

This tendency causes increasingly unequal division of material resources and in extreme cases even an exclusion or marginalisation of segments of society living on welfare or minimum wages.

Information inequality may also be a consequence of the rising cost of information and communication and the ICT goods and services, while household budgets are shrinking or static.

The third tendency is political. The policy of privatisation and stimulation of the free market economy tolerates rising material inequalities and is leading to commercialisation of formerly public information supply and communication facilities and an increase in private education.

Finally there are the continually diverging areas of application of ICT. Computers are multi-functional and (re)programmable to cope with very simple domestic actions and highly complex economic, political and educational requirements.
This technological capacity is what sets ICT apart from more familiar old media like the press, broadcasting and the telephone. A neutral property in its own right, the extended multi-functionality of ICT offers many more opportunities to expand existing information inequalities.

Together these four tendencies produce a force which easily induces greater information inequality and is very difficult to prevent. Is there anything wrong with such differences among people increasing anyway?

To put it bluntly, using ICT does not necessarily makes one more happy. It may not even improve your position in society.

Our consideration must be strategic, and based on support for the most important values of civil society since the French revolution (freedom, equality and solidarity) and a sober scientific analysis of the effect of the growth of structural information inequalities in 'network society' - an expression describing a society shaped by more or less diffuse social networks increasingly realised by media networks gradually replacing the so-called mass society of dense gatherings of people who interact primarily face-to-face.

In a network society the positions people take in media networks will be decisive for their influence in taking decisions on all kinds of social affairs. To have full access to these media is absolutely vital for true participation.

However, present use of ICT appears to be much more to the benefit of the existing information elite, than it is to the rest of society. There is even a risk of social and communicative exclusion of groups already marginal in society.

Researchers have already noted the development of a fairly homogeneous elite operating globally using their networks and other media to appropriate, transmit and control capital and information without limit of time and place.

Alongside them are all kinds of subordinate groups, much more tied to time and place, filling these resources and media with labour, data and increasingly heterogeneous cultural expressions without having any hold on the market, technology and the world.

Usage of ICT might contribute to the development of such deeply rooted structural inequalities that every political, social and cultural democracy will become hollow and many citizen rights will be emptied of their substance. We may be moving (back) towards first, second- and third-class citizens.

To mitigate information inequality, it is necessary to prevent structural inequality by making the right strategic choice of opportunities which determine whether people are included or excluded in the Information Society.

This requires general and specific information policies which are not just a matter for governments and public administrations, but also for the organisations of civil society and socially-responsible private corporations.

The realisation of a minimum provision of information and communication for every citizen, if not every inhabitant of a particular country, is the most important action.
This begs the question as to which information and communication facilities should or need to be available to everyone in an Information Society.

The Information Society Forum has taken the view that this is a matter of extending the principle of universal service, modernising public service in a society characterised by economic privatisation and technological convergence, by guaranteeing access to the following:

i. *Basic private and public communication connections, to be able to participate in society and social life generally.*
Until now this function, along with face-to-face communications, has been realised to a large degree by the telephone and printed mail. In the short or medium term it must now be extended to electronic mail and audio-visual channels of broadcasting.

ii. *Public information and communication.*
Since the citizen is supposed to know the law and be able to participate in a democratic society, in the new media environment public administration has to be extended to, not replaced by, electronic copies.

All documents containing laws and regulations or decisions of official bodies and sources of information used for these decisions - paid for by taxation - must be available in electronic form, free or at very low cost, and citizens must have the opportunity to respond using electronic channels.

The citizen's right of access to public service broadcasting via a diversity of sources and feedback channels, must be safeguarded against the trend towards narrow-casting and pay-TV.

iii. *Health communication and information* - for evident reasons, e.g. emergency services.

iv.*Educational information and communication as a logical consequence of compulsory education.* Transforming these information resources into meaningful usage opportunities is a vital skill for citizens, alongside access to and competence in ICT hardware and software.

The most important skill is the capacity to search, select and process information from the fast growing sources of supply. It is perhaps the most unequally distributed skill among Western populations, yet it is decisive for the potential to live and work in the Information Society.

School curricula, communication skills or media education will only partially provide this facility.

Conventional approaches to mathematics and language will have to be transformed to cover data processing and the search, selection and processing of information, with much more attention given to the language of images and to audio-visual content.

More specific policies to prevent information inequality must address the four key barriers to access described above.

Knowing how to use ICT equipment is crucial. Although the concept of a 'computer-driver's license' fits nicely with the analogy of the right of participate in transport network, it would reinforce the notion of computers as difficult. It would be better to integrate the learning of computer skills in basic and in adult education, as an obligatory subject in adult education.

The development of public information distribution outlined above will assist in encouraging access to and familiarity with computers and networks.

The supply of services in public buildings is only a second-best solution. Hopefully it will motivate people to make use of these services and feel more confident about obtaining their own hardware and software at home.

Possession of ICT equipment is more a matter of general income policies which are much more popular in Europe than in the US.

Both sides of the Atlantic have some form of welfare, poverty or minimum wage policies, but they run behind social developments - the increasing proportion of average household expenditure on communication is not taken into account.

Some European countries with relatively high levels of social welfare have felt obliged to provide benefit claimants with supplements to cover telephone connections, daily newspapers and even computers with Internet connections.

There is room for significant improvement in the user-friendliness of hardware, software and operating instructions. Commercial pressures should persuade the ICT industry, but users, user groups, consumer organisations and trade unions should be lobbying for a say in the design.

Unfortunately, it is still common practice for suppliers to rely too much upon their internal technical capacity and too little upon the needs and contexts of users. The resulting products and services remain unattractive to exactly those who already feel excluded from/by the new media.

Even if practical impediments to equality in the Information Society are reduced, there is no guarantee that equality of usage will result. Much broader and generally supported policies would be needed to overcome the very different ways in which different social classes make use of ICT.

Working class use tends towards electronic financial transactions, tele-shopping, consuming multimedia entertainment at home and data entry or the plain execution of computer tasks at work; middle-class use of the new media tends towards the interpretation and utilisation of data in advanced applications for taking decisions at work, and for supplementary professional work and educational multimedia programmes at home.

If such structural inequality is to be challenged attention will have to be paid to deeper social issues - lifelong learning, job mobility, unemployment and the full emancipation of women and ethnic minorities, to name but a few.

Overcoming new barriers to access

If the Information Society is to be more inclusive, hardware and software manufacturers must listen to people with disabilities, argues Prof. Rodolfo Cattani of the Italian Institute for the Blind, in a condensed version of his contribution to the conference.

To make full use of the keyboards, screens, telephone handsets and smart cards which are the tools of the Information Society you have to be young, clever, able-bodied, have good sight and good hearing, be strong, speedy and somewhat aggressive.

But what happens if you are visually impaired, if you have hearing problems, if your mobility is reduced, if your mind works at a slower pace, if you are dyslexic? What will you do in your old age, when your body will start refusing to fight and the world will seem to change from a kind of happy playground into an increasing nightmare? What will happen if you become sick or poor? Is it a luxury to pay attention to all these human beings who do not conform to the characteristics of the 'dominant' race?

The solution to the problem is a design-for-all policy, the main aspects of which should be to:

- check the accessibility of existing equipment and services ;
- design and develop new equipment and services available for the widest range of users, including those with special needs;
- deliver equipment and services according to the capacities of the users;
- promote legal measures requiring service providers to make public terminals accessible to people with disabilities.

For people with disabilities the extended use of information technology is something of a two-edged sword. On the one hand Information Technology (IT) seems to open unexpected possibilities for them to access information, to communicate with an unlimited number of partners and to move freely on the electronic highways as well as to orientate themselves better in their physical surroundings. On the other hand IT may generate new problems and similarly raw and unadapted technology can deny any access to a user with a disability.

If we do not want to create new discrimination, we must achieve an Information Society-for-all through an inclusive IT policy that acknowledges social responsibility towards all citizens.

There are at least five primary targets if conditions for people with disabilities are to be improved:

- preventing wrong policies,
- positive action to implement solutions;
- creating conditions for equality of opportunities;
- promoting the ability to exert influence over attitudes;
- drawing attention to problem areas.

Some of the difficulties encountered by people with disabilities are due to the fact that the developers of new products are not aware of their needs. Many problems could be avoided by involving concerned users in the development process.

These limitations are not inherent to information technology itself, which is characterised by its great flexibility, but in the requirements we fail to set on the technology.

Experience shows that it is hardly possible to guarantee accessibility for people with disabilities without an active positive policy. Since IT products - like those of every industry - are created with the so-called normally-abled consumer in mind, people with special needs are expected to adapt themselves to this stereotypical consumer model instead of being offered alternative options.

Sometimes adapting products which are already on the market becomes an additional business opportunity for the industry. The result is that often people with disabilities cannot afford the product.

A new principle needs to govern the Information Society - the philosophy of universal design to shape and adapt the environment so that in the long term we can reduce the use of specially designed assistive devices and equipment.

We must try and promote the development of products which can, to the greatest possible extent, be used by everyone, or which are designed to be so flexible that they can be easily adapted to the needs of people with special needs.

In order to take full advantage of the opportunities that are offered by IT, standardisation, creativity and interoperability should be key elements in future developments. The fall-out would be beneficial for all, not just for a limited group of users.

Disability organisations and experts must be included in the development process - e.g. testing new solutions and products - if people with disabilities are to be informed about and participate in projects that concern them.

The Information Society should be accessible to all, because equality of access to information for all citizens is fundamental to any democratic society. People with disabilities should be granted such access on an equal basis.

The accessibility of electronic communications technology is especially important for people with disabilities. Their ability to participate in the democratic process would be greatly enhanced if this became the preferred way of improving links between citizens and the public sector. Teleworking can also create new opportunities for disabled workers.

Universal-design solutions are a reasonable and preferable alternative to 'special' solutions - which are often unsatisfactory and more expensive both for the manufacturer and for the user - but they do require that the needs of people with disabilities are known and considered right from the beginning of developing new IT devices.

This does not mean an end to 'customisation' - product design that does not discriminate against any group of disabilities, but is likely to mean great flexibility and a capacity for adaptation to assist those with special needs.

It is essential that the process of change towards the Information Society be managed in a way that promotes trust and confidence amongst citizens in its possibilities to improve people’s quality of life.

The 1996 European Commission’s *Living and Working in Information Society, People First*, promoted a broad discussion on how to reap the benefits of the Information Society in terms of work organisation, employment and social cohesion as well as regulatory principles.

Subsequently the Commission stated, in *People First, Next Steps* (1997), that regulation of the Information Society should have as a basic aim promoting inclusion and support for people with special needs and those lacking opportunities to improve their position.

The Information Society Working Group of the European Disability Forum is working on a Manifesto which considers the potential and challenges of the Information Society - since it may generate new barriers for disabled citizens as to their right to equal access to information and inclusion in society, protective regulations are essential.

Disabled people’s interests concern the whole sphere of their lives and not just single aspects like mobility and health issues.

Full participation in the Information Society means an ability to access it, to afford it, to be aware of its potential, and the availability of services and products appropriate to people's needs.

The image of disabled and elderly people as passive recipients of care and health services is simply wrong. Regarding disabled people as a homogeneous group is discriminating and disregards their abilities and potentials.

All players in the development of the European Information Society should acknowledge the need for all groups of disabled people, with their different needs, interests and abilities, to be involved in the shaping of their own future.

Exclusion from participation in societal development is undemocratic and discriminating. The right to participation, to independent living and to full inclusion should be granted through effective regulatory measures which European states should be encouraged to implement.