installation and management of a GPL/Linux System. Because GPL/Linux can be freely distributed, anyone can take a base GPL/Linux system, add software, documentation, and a way of packaging and installing it all, and ship it as their own. Examples of distributors:

- **Red Hat** <http://www.redhat.com/>
- **Debian** <http://www.debian.org/index.en.html>

There are a number of sites for downloading application software:

- **Freshmeat** <http://freshmeat.net>
- **LinuxApps** <http://www.linuxapps.com/>
- **Tucows software archive** <http://www.tucows.com/>
- **UK Mirror site, archive of software** <http://www.mirror.ac.uk>

Applications include MS Office equivalents, for example:

Open Office <http://www.sun.com/staroffice/>,

kOffice <http://www.koffice.org/>, and

GNOME Office <http://www.gnome.org/gnome-office/>.

The whole subject of 'free' and 'open source' software is vast, with many differing views and opinions. The GNU Project site and the OSI site contain discussions of the subject. An often quoted article is *'The Cathedral and the Bazaar'* by Eric Steven Raymond (a co-founder of OSI), <http://www.tuxedo.org/~esr/writings/cathedral-bazaar/>. This article discusses the benefits of the open source approach to software development. Additional articles are: *Homesteading the Noosphere* covering the property and ownership customs of the open-source culture; and *The Magic Cauldron* looking at the economics of open-source software. You may find an article by Jon C LeBlanc, *Migrate With Confidence From Microsoft Windows NT and Windows 2000 to UNIX/Linux. Strategic Information for IT Managers* <http://web.cuug.ab.ca/~leblancj/nt_to_unix.html#one> interesting.

Reference

1. Carnall D. Medical software's free future {Editorial.}. *BMJ* 2000; **321**: 976 <http://www.bmj.com/cgi/content/full/321/7267/976>

NHS Direct Online and the information divide

Dr Michael Wilkinson and **Susan McPherson**
Health Informatics Group, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT

michael.wilkinson@lshtm.ac.uk; susan.mcpherson@lshtm.ac.uk

Health Information and the modernisation agenda

As part of a general modernisation agenda, the British Prime Minister noted in the foreword of *Our Information Age: The Government's Vision*[1] (which has been removed from the No. 10 Downing Street Web site and there appears to be no archived version anywhere, indicating in itself gaps in government e-policy):

Information is the key to the modern age. The new age of information offers possibilities for the future limited only by the boundaries of our imaginations. The potential of the new electronic networks is breathtaking, the prospect of change as widespread and fundamental as the agricultural and industrial revolutions of earlier eras.

I want to ensure that everyone in the United Kingdom has the best chance to seize this moment – our information age, which offers new opportunities for greater prosperity, and a better quality of life.

Supported by government and private sector investment, and driven by rising consumer demand, the now ubiquitous nature of Information and Communication Technologies (ICT) continues to transform almost all areas of public and private life in modern Britain. A wide range of areas continue to be influenced by the 'white heat' of these investments in ICT, including education, entertainment, transportation and social services. The *Information for Health*[2] strategy document of the UK Government set out to grasp the opportunity which new information technology offers to improve health and healthcare. At the core of this strategy is the desire to meet the information needs of four distinct groups: (i) patients, (ii) healthcare professionals, (iii) managers and planners, and (iv) the public.

The NHS Direct nurse-led telephone service to the public, which will soon provide national coverage, seeks to provide advice on health and health services. Complementing this localised telephone-support service is NHS Direct Online[3]. This Web-based service seeks to provide information for the public through an internet interface. After nearly one year in operation, the NHS Direct Online service is also set for further expansion, principally in areas related to content provision.

The current NHS Direct Online Web site contains a range of health information content that is concerned with providing online information on healthy living, illnesses, conditions and treatments. The current portfolio of content provision, which is often supplied by national NGOs (non-governmental organisations) under licence to NHS Direct Online, is characterised as primarily:

- English-based, although a limited amount of content is presented in non-English languages
- text-based, with some audio content
- disease-focused

Although most of the content on NHS Direct Online is not dynamic, the content portfolio does contain some interactive elements, including decision-support tools to help people recognise symptoms of disease. Evidence-based treatment summaries and some audio/video material are also available. A database to help people find their local pharmacist was made available in December 2000, with development

of databases for dentists and opticians planned for early 2001.[4]

Health information and digital exclusion

It is well known that community groups that experience most social exclusion are also most likely to experience disproportionately higher levels of disease mortality, morbidity and healthcare costs. For example, South East Asian men living in the UK are significantly more likely than their white counterparts to suffer from premature death and disability due to heart disease with a mortality rate estimated at 40-50 % higher.[5, 6] Similarly, the poorest in our society are also the most likely to smoke cigarettes[7] and to suffer from the effects of cancer as a result.

Recognising the potential damaging effects of social exclusion and the growing digital divide, the UK government has funded a number of initiatives to develop ICT capacity where it is most needed. Most of this investment has focused on developing infrastructure in libraries, schools and other community settings, usually to support the National Grid for Learning (NGfL).[8] In contrast to Government investment in ICT infrastructure, investment in the creation of content has been noticeable by its absence.

As reported in the PAT-15 strategy group report *Closing the Digital Divide*,[9] the general lack of culturally-appropriate content is a major barrier to wider Internet participation for many of the poorest in our society. In order to encourage wider participation, content needs to be presented in a manner that fits the information needs of different cultures. The development of such content goes beyond mere translation, and includes critical communication issues related to tone and pace of the written word, in addition to culturally appropriate use of images and sound.

At present in the UK there are several internet-related health portals, including NetDoctor,[10] PatientUK,[11] and Lloydspharmacy.[12] NetDoctor is a commercial site run by a consortia of independent doctors and pharmacists. Patient UK is run by two GPs with

commercial sponsors and managed by an Internet Services Agency. Lloydspharmacy is a commercial site run by Lloyds Pharmacy, purchasing content from independent contractors. The current portfolio of content provided by these, and other, private-sector health portals is similar to that which is currently available in the public sector sites (e.g. BBC Online Health and Fitness[13] and NHS Direct Online). In essence, the private sector and the public sector are both serving the same market – leaving people most excluded from society also most excluded from participating in and benefiting from the Internet and health.

Private sector health portals in the UK are all competing for the same market – notably white, middle-class population groups. These populations are by far the easiest to design content for, and they are also the most profitable in terms of business models designed to attract sponsorship (Netdoctor) and sales (e.g. the Wellbeing site[14] run by Boots and Granada Media).

In contrast to private-sector health portals – which seek to design service provision to drive profit – public sector health portals should be driven by a community service (e.g. BBC) and health-gain (e.g. NHS Direct Online) motive. In essence, NHS Direct Online should be providing content that is reflective of the whole of modern British society, including those sections that are not likely to generate any profit.

There is a pressing need for NHS Direct Online to be extended to help groups most excluded – the poor, ethnic minority groups, older people, disabled people. Failure to provide such content will further isolate and alienate these groups and further compound health and social problems. By contrast, a focus on health gain that includes provision for currently excluded groups has the potential to yield health and social benefits for both at-risk individuals and society generally.

Development opportunities

Given the need to close the digital divide and to promote a more inclusive society, there is a need to ensure that the content that is made available on NHS Direct Online is sensitive to the trans-cultural nature

of modern Britain. The following areas may be considered for development:

1. Design

The general design of the site should take into account accessibility for various excluded groups. From a disability point of view this might include making the site accessible for partially sighted users by following Royal National Institute for the Blind (RNIB) guidelines on communicating with blind and partially sighted people[15] or making sure it works with 'talking computers'. The design of the site should also take into account that economically disadvantaged groups may not have access to recent Web technology advances (e.g. Flash) and so the site should aim to be accessible to older as well as newer technology. The home page of the site should also be able to effectively direct people to foreign language versions and text-only or disability versions.

Ongoing market research and user-oriented research strategies should be developed to advance opportunities for NHS Direct Online within a highly dynamic market environment. This will help to ensure that the needs of users are taken into account and are used to inform the development and application of new Web technologies. Research reports should provide a detailed analysis of the existing and emerging market, and provide detailed recommendations on strategies to:

- improve the look and feel of the NHS Direct Online Web site

- advise on use of images, text, search and find strategies

- enable media convergence to additional media platforms, e.g. Digital TV (DiTV)

- develop branding and marketing strategies within the UK

- international exploitation of NHS Direct Online Intellectual Property Rights (IPR)

2. Extend Text Portfolio

In order to make the content portfolio of NHS Direct Online more

representative of the UK population as a whole – and to assist people who are currently excluded from access to content by both the private and public sectors – the current portfolio of fact sheets and audio clips should be extended to include non-English content. This should not merely involve direct translation of existing English text, but development of culturally relevant and appropriate content through collaborative work with non-English speaking users and organisations representing ethnic minorities.

3. Extend Audio Portfolio

Audio clips are particularly useful for people who have difficulty reading, due to poor eyesight or who have low literacy levels. The existing audio-clip portfolio should be extended to include the primary Asian and Chinese languages.

4. Build a Transcultural Video-Clip Library

There is currently a significant amount of interest in video-based content. Rising consumer demand, in addition to improvements in the capacity of hardware and software, have served to drive this demand. There are a range of new developments in DiTV, including the new Wellbeing channel from Boots and Granada and new pilot projects, such as NHS Digital[16].

Video-based content has a significant amount of utility, particularly for people who have low literacy skills or people who prefer to acquire information on multimedia formats, who may often be those who are socially excluded.

The Department of Health currently houses a vast library of health videos. There is a need to review this current investment and to provide a detailed analysis of the range and quality of the existing videos and their potential application for NHS Direct Online.

Conclusion

The ultimate paradox of the Internet is its enormous potential to isolate and increase inequalities while also having the potential to connect people and reduce inequalities. It is therefore vital that projects such as NHS Direct Online, where the aim is

the latter, create a framework to ensure maximum inclusion in the information society. Such a framework would need to be sensitive to the cultural diversity which now informs modern Britain. This inclusive framework would have greater potential to:

… ensure that everyone in the United Kingdom has the best chance to seize this moment - our information age, which offers new opportunities for greater prosperity, and a better quality of life.[1]

References

1. No. 10 Downing Street Web site. *Our information age. The government's vision.* Policy statement. London: Central Office of Information, 1998. Document previously available at: <http://www.pm.gov.uk> (i.e. http://www.pm.gov.uk/default.asp?PageId=1590) *N.B. copy no longer archived*

2. National Health Service Executive. *Information for health. An information strategy for the modern NHS 1998-2005. A national strategy for local implementation.* London: Department of Health, 1998. Copy available at: <http://www.doh.gov.uk/nhsexipu/strategy/index.htm>. The NHS Information Policy Unit is responsible for the development and implementation of the NHS Information Strategy, Information for Health. <http://www.doh.gov.uk/nhsexipu/>

3. NHS Direct Online <http://www.nhsdirect.nhs.uk/>

4. Department of Health. *Building the information core: Implementing the NHS Plan.* Section 3. *Delivering Information.* London: Department of Health, 2001. Copy available at <http://www.doh.gov.uk/nhsexipu/strategy/update/ch3/3.htm>.

5. McKeigue PM, Shah B, Marmot MG. Relation of central obesity and insulin resistance with high diabetes prevalence and cardiovascular risk in South Asians. *Lancet* 1991; **337**: 382—6

6. Balarajan R. Ethnicity and variations in mortality from coronary heart disease. *Health Trends* 1996; **28**: 45-51

7. Department of Health. *Smoking Kills - A White Paper on Tobacco.* (Chapter 1: *Smoking Kills. Smoking and Inequalities* 1.20 to 1.23). Presented to Parliament by the Secretary of State for Health and the Secretaries of State for Scotland, Wales and Northern Ireland by Command of Her Majesty. Cm 4177. 1998; London,The Stationery Office <http://www.official-documents.co.uk/document/cm41/4177/chap-01.htm#sub-4>

8. NGfL. National Grid for Learning <http://www.ngfl.gov.uk>

9. Department for Trade and Industry. *Closing the Digital Divide: Information and communication technology in deprived areas.* Report by the Policy Action Team 15 (PAT 15). London: DTI, 2000. Copy at PAT 15 Web site <http://www.pat15.org.uk>

10. NetDoctor: the UK's independent health Web site <http://www.netdoctor.co.uk>

11. Patient UK: a directory of UK health, disease and related Web sites <http://www.patient.co.uk>

12. Lloydspharmacy <http://www.lloydspharmacy.co.uk>

13. BBC Online Health and Fitness site <http://www.bbc.co.uk/health/>

14. Wellbeing <http://www.wellbeing.com/>

15. RNIB. Helpful facts on communicating with blind and partially sighted people <http://www.rnib.org.uk/wesupply/fctsheet/method.htm>

16. Department of Health. *Building the information core: Implementing the NHS Plan.* Section 3.2.3. *NHS Digital.* London: Department of Health, 2001. Copy available at <http://www.doh.gov.uk/nhsexipu/strategy/update/ch3/3_2_3.htm>

News items

Behind the Headlines on RDN

The Resource Discovery Network (RDN), funded by JISC, has recently put out a press release on a new service *Behind the Headlines*.

The service offers users background information on the latest news stories via pre-set searches of high-quality Internet resources. All of the RDN's 30,000 resources are selected, catalogued and described by subject and information professionals drawn from over 60 UK education institutions and related organisations. The service is offered free at the point of use and is available online …

<http://www.rdn.ac.uk/news/headlines>.

Access on 20th June found a number of 'health-related' stories: diabetes; high blood pressure and dementia; shaken baby syndrome; abortion in Northern Ireland; BSE in Europe.

Healthfinder redesigned

A recent press release alerted people that healthfinder <http://www.healthfinder.gov>, the US Federal Government's portal to reliable health information on the Internet, was being redesigned.

In June a public preview was offered, with opportunities to comment and feedback <http://www.healthfinder.gov/preview>.

New features of the redesigned site include: daily health news; interactive online checkups; more prevention, wellness, and alternative medicine resources; an expanded Spanish section; a new section just for kids 8—12.