Public access to the internet

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The advent of the Internet brought with it hitherto unheard of possibilities for human creativity, information access, and global communication. When did these possibilities actually translate into widespread public access to the Internet? It is difficult to specify a date, but one can identify a few key developments and the key actors behind those developments.

Long before the advent of the Internet, the counterculture movement - Vietnam, alternative technologies, etc. - gave birth to the first community network, when the Community Memory system was developed in the early 1960s in San Francisco by a group of hackers. Then in 1986 the Cleveland Free-Net in Ohio started a new generation of community networks. Free-Net soon drew thousands of new users, and new systems were established in dozens of cities, mostly in Midwest USA. These free public-access computer networks enabled people not only to exchange and access information but also empowered them.

1971 saw two key developments: Raymond Tomlinson's invention of a program for email[1] for ARPANET, the network of scientists working on Defense related research, permanently changed the way people viewed computers and human communication[2], and Michael Hart's Gutenberg Project that made copyright-free books electronically available[3] led to the creation of huge volumes of electronic content for sharing world wide. Two more developments took place in 1973: Vinton Cerf and Robert Kahn presented basic Internet ideas based on ideas for Transmission Control Protocol (TCP, later to be called TCP/IP) at a meeting at the University of Sussex[4], and ARPANET had its first intercontinental connection - with the University College of London, England. The early 1980s saw many institutions not doing defense research accessing the network.

By 1985, Internet was already well established as a technology supporting a broad community of researchers and developers, and was beginning to attract other communities. Electronic mail was being used broadly across several communities, often with different systems.

The first commercial Internet services were offered by PSI and AlterNet in early 1990. In August 1991, CERN released the World Wide Web, a major milestone in the history of the public access to the Internet. On 15 September 1993, the Clinton administration formally launched the National Information Infrastructure initiative in the USA, thanks to the initiatives taken by Vice President Al Gore. The Mosaic web browser version 1.0 was also released in 1993, and by 1996 the word "Internet" was common public currency, but it referred almost entirely to the World Wide Web.

Although the new development was compared to the highways which in an earlier

generation has transformed transportation, it soon became clear that the Internet was far more than the ‘information superhighway’ and capable of providing access to higher levels of intelligently ordered and functionally enriched distributed information. That is where the Internet differs considerably from the traditional library, the place where people went to seek information.

The growing popularity of computerized communication prompted discussion regarding many fundamental aspects of social interaction, including questions of privacy, community, cultural exchange, ownership of knowledge, and governmental control of information, all of which are related to public access.

What is public access?

Public access includes access to the technology (the computer, connectivity, bandwidth, etc.) and access to all the content stored in the world's greatest artificial network, as Newsweek calls the Internet. Of the two, the second is hierarchically above the first, as the technology is subordinate to the content (knowledge) it can bring in. This is similar to bringing in water to a village through a pipeline, where clearly the water is more important than the pipes. Both the technology access and the content access can either be free or fee based. The content could be textual, audio, video or multimedia. The connectivity can be through a variety of technologies ranging from dial-up using a landline telephone and modem to wi-fi and handheld devices (smart phones, game console, etc.).

The public can use Internet access to send and receive emails, take part in listservs and discussion groups, and for searching information. Scientists use it for collaborative research as well, and the common people use it for talking to others either through chatting or through voice-over-IP. More recent uses of Internet access include data exchange via P2P technologies, music sharing, blogging, vlogging, citizen journalism, getting RSS feeds of news from different sources, and podcasting.

Apart from their own homes and offices, the public can access the Internet from public libraries and cybercafés, and to some extent from educational institutions and the ever-expanding telecentres as well as hotel lobbies and airport lounges equipped for wi-fi access.

The vast quantities of information that can be accessed by anyone, anywhere, any time at no cost can be referred to as the information commons. Public access to the Internet is based on the idea that even in profit-dominated market economies, communal ownership and control of information resources can be efficient and effective [5].

Towards universal access at the world level

The major debate today revolves around "universalization" of access. Why is universalization so important? Researchers like Ernest Wilson worry that, in the absence of universal access, the rapid diffusion of the Internet into the organizations, cultures, and

societies of industrialized nations may widen the multidimensional gap separating them from developing nations, exacerbating an already significant moral and practical problem [6]. Larry Press believes that the Internet's flexible, low-cost communication may lead to improved economic productivity, education, health care, entertainment, awareness of the world, and quality of life in developing nations and pockets of poverty within nations, thus reducing disparity [7]. There are a number of barriers to universal access. While in most of North America and Western Europe, Internet penetration is very high and very nearly every citizen who wants to access the Net can do so, in many parts of the developing world, and in particular Sub Saharan Africa, only a small percent of the population can have access, even if the bandwidth is abysmally low and the cost forms a substantial fraction of one's income. The numbers of computers, telephones, etc. per thousand inhabitants and the bandwidth in most of these countries are very low compared to the advanced countries and they are unevenly distributed [8]. It is to overcome this "digital divide" developing countries are pleading for the setting up of a Digital Solidarity Fund [9].

In many developing countries, efforts are being made to overcome the digital divide or the lack of technology by setting up community owned telecentres which gather and provide the information needed by the local people.

The development of telecentres

Telecentres, also known as public access points (France), digital community centres (Mexico), and so on, differ from cybercafés in the way they work. Cybercafés are mostly intended to provide the people who use them with an Internet connection, and, where necessary, a very basic introduction to the equipment. They operate along the lines of a self-service establishment. Telecentres are intended to accompany community use of the Internet (education, health, micro-enterprises, and so on). They are generally opened in neighbourhoods without cybercafés and are for communities that are a priori excluded from the information society. In addition to making available equipment and connections, telecentres provide training and assistance for various uses (helping local people develop community applications, for instance).

In practice, the difference between telecentres and cybercafés is not always clear-cut, and the two can overlap according to the objectives of the people running them and the development model selected.

In fact, there are three main models for the establishment of telecentres:

- Telecentres supported by local or national public authorities. For example, a town like Brest [10] in France has systematically equipped itself so that each inhabitant has a public access point less than 300 metres from home. Between 1999 and 2001, Argentina implemented a wide-ranging infrastructure programme that involved setting up 1,350 Community Technology Centres (CTCs) [11]. The Indian government took the same approach in the States of the North-East [12] and most national plans for the information society now include telecentre projects under the heading "social inclusion".

- Telecentres that are the initiative of a group of local people, a local voluntary group or a school. They often receive backing in the start-up phase from an NGO [13] or international aid agency. For instance, IDRC, a Canadian development agency, and IICD, a Netherlands agency, developed extensive support plans for telecentres in the early 2000s. UNESCO has also supported many Community Multimedia Centres (CMCs) to promote community empowerment and address the digital divide by combining community broadcasting with the Internet and related technologies [14].

- Telecentres that are designed as private enterprises with authentic business plans that can only exist in areas where basic needs can be met. Although their profitable activity brings them closer to cybercafés they are nevertheless dedicated to the needs of the community.

The first experiments date back to the late 1990s, and since many telecentres have closed down since then, it is possible to identify certain conditions that are essential (although certainly not enough on their own) to the success of telecentres:

- The launch of a telecentre genuinely responding to the needs of local people, these needs varying considerably not only from one country to another but from one village or neighbourhood to another;

- Funding for training trainers and not only for equipment;

- Provision of freeware enabling technological autonomy and avoiding regular reinvestment in applications and upgrades;

- Existence of the minimum infrastructure to allow technical functioning (energy, viability of the premises, etc.);

- Presence in spaces that are already meeting the needs of local people other than connectivity (health centres, social centres, libraries, and schools);

- Construction of a development model that gradually enables financial independence from the original donors. Many failures were due to outside subsidies running out.

Public access points, or telecentres, have developed significantly in Latin America and the Caribbean and many of them have joined forces in the exchange network. [15]

Africa is, of course, the continent where such centres have experienced the most problems in keeping going. Low population density, low literacy levels, oral culture and the poor quality of supply from operators mean that developing the telecentres is, on the whole, difficult. On top of these generic difficulties, telecentres have also come up against the structural impossibility of finding independent income: in solvent areas, cybercafés have sprung up at great speed, preventing the establishment of telecentres ; in insolvent areas, international donors often became tired of funding projects that were

often over-ambitious from the outset (Africa is the continent where North-centred visions of the information society have been transposed without really taking local needs into consideration, thereby condemning projects to fall into disuse). [16]

India, on the other hand multiplied the telecentre experiments by adopting different models, including community owned, revenue model and government-supported centres.

A good example of the community-owned model is the village knowledge centres established by the M S Swaminathan Research Foundation (MSSRF) in several villages in southern India. [17] [18] The most well-known use of the Internet in these centres is broadcasting, through a public address system advance information on wave heights in the Pondicherry coast, downloaded from a US Navy website so that fishermen in coastal villages can decide if it is safe for them to venture into the sea on a given day. Since this service was begun in 1999, there has not been a single death in the sea in these villages. In collaboration with OneWorld International, MSSRF set up the Open Knowledge Network (OKN), that connects rural communities in Asia and Africa for exchanging local content, indigenous knowledge, and traditional practices [19]. Besides Internet, OKN uses cell phones and radio for communication.

The ITC's eChoupals are a good example of the revenue model [20]. The National Informatics Centre of the Government of India has established many centres in the north-eastern states [21]. Thanks to the initiative taken by MSSRF, a National Alliance, perhaps the largest multi-stakeholder partnership in development, has been formed to take the knowledge revolution to each one of the 638,000 villages in India before the 60th anniversary of India's Independence [22]. The Government of India has come forward to meet a large part of the costs, to the tune of $1,500 million.

While in general technologies tend to exacerbate inequalities and favour the early adopters at the cost of those who come in late, thanks to the free and unhindered flow of information it facilitates, the Internet is inherently a democratizing technology and it can make access to information a level playing field. How can we translate this inherent potential into reality? It is here we recognize the great value of the "public commons" approach to sharing information.

Public commons and information sharing

Let us see how the public commons approach to disseminating scientific knowledge is affecting the way scientific research is performed around the world. This example, which has reached maturity, shows the impact of the concept of public commons on the spread of global public access to information content.

About 15 years ago Paul Ginsparg, then at Los Alamos National Laboratory, thought of a central archive for physics research papers. Now arXiv is flourishing with its headquarters at Cornell and has more than 15 mirror sites (a few of them in developing countries) [23]. Steve Lawrence, then at NEC Research, Princeton, started CiteSeer

which does not wait for authors to submit/deposit their papers but crawls the Net and collects all papers in computer science and related fields [24] . Stevan Harnad at Southampton created Cogprint, an archive for cognitive sciences [25] . He also wrote a few provocative papers on what he calls a "subvertive proposal" to expand "scholarly skywriting", the way scientists are able to write in the internet sky, for everybody to read [26]. Following this impulsion, in the past few years scientists have started depositing their research papers - besides publishing them in refereed journals of their choice - in interoperable institutional open access archives. The software for setting up these full text archives are absolutely free. The interoperability protocol (OAI-PMH [27]) and associated software that enable a user to trace all papers on a given subject or by a given author from anyone of the archives (located anywhere in the world) as if they are all in one single (universal) archive is also absolutely free.

Today there are more than 400 such interoperable institutional archives providing access to the full texts of many thousands of research papers. This is especially helpful to scientists in the developing countries. Peter Suber maintains a blog [Open Access News] and reports comprehensively on developments of the open access movement around the world [28] .

Along with open access archives, there are also open access journals for which readers and their libraries do not have to pay a subscription. More than 1,700 journals - including a few hundreds from developing countries - are now OA journals [29].

Access to knowledge all around the world

One can see a parallel between the telecenters and the open access archives. Both of them are using advances in technology to include the excluded and making available much needed information at a low cost through the "public commons" approach. Both of them are overcoming a serious problem by intelligently marrying technology and the public commons approach. Both of them are about sharing and caring. Both of them are eminently suited to increase the overall productivity of the world as a whole and lead to greater collective happiness. It sounds almost utopian.

But many publishers, including some scientific societies, are working to stall the progress of the open access movement, as they see it as a potential threat to their business interests. On the other hand many donor agencies, such as the Wellcome Trust, who fund scientists to perform research are avid supporters of the movement.

In the area of scientific data, as distinct from full texts of research papers, organizations such as ICSU (and CODATA) are promoting the culture of open access. Even Celera Genomics Corp., the for-profit company that sequenced the human genome simultaneously with the public-funded Human Genome Project, has stopped selling subscriptions for access to its sequence/data and would donate the data to the National Center for Biotechnology Information, USA. As Francis Collins of the National Human Genome Research Institute put it "data just wants to be public."

Scientists in developing countries need particular attention, says Bruce Alberts, former President of the US National Academy of Sciences. In his 1999 presidential address [30] to the National Academy of Sciences, USA, he suggested "Connecting all scientists to the World Wide Web, where necessary by providing subsidized Internet access through commercial satellite networks," and "taking responsibility for generating a rich array of scientifically validated knowledge resources, made available free on the Web, in preparation for a time when universal Internet access for scientists is achieved in both developing and industrialized nations."

From cyberspace to the real world

In the early days of the Net, there was a feeling that the Net had given us the freedom to do things independently from the governments and the law of the land. Indeed, back in February 1996, John Perry Barlow, an Internet activist, published a "Declaration of the Independence of Cyberspace". [31] "Governments of the industrial world," Mr Barlow declared, "on behalf of the future, I ask you of the past to leave us alone. You are not welcome among us. You have no sovereignty where we gather. You have no moral right to rule us nor do you possess any methods of enforcement we have true reason to fear. Cyberspace does not lie within your borders." And the Internet became one of citizen advocacy's most important tools used for research, public education, organizing, political discussion, coordination, and much more.

Unfortunately digital technology also has brought about new forms of information enclosure that undermines the public's right to use, share, and reproduce information. Such enclosures threaten to undermine the political discourse, free speech, and creativity needed for a healthy democracy. And in reality governments can and do have considerable control over what is transacted on the Internet. As the Economist pointed out, "the Internet is part of the real world. Like all frontiers, it was wild for a while, but policemen always show up eventually." [32]

Both the democratic character of the Internet and its ability to reach out to a ?near infinite' knowledge base have come under question. If the high cost, low quality and rarity of Internet access add up to make the first barrier to public access to Internet in poor countries, the policies and attitudes of institutions and governments lead to a second kind of barrier. As the Carnegie Endowment for International Peace has found, governments can prevent their citizens from visiting certain sites they consider harmful to national interest, control access to overseas sites, monitor postings by their citizens, and they can literally isolate their people from the rest of the network [33]. Schools and parents may use a filter to save children from the ever-increasing presence of smut sites on the Net. How can we otherwise save ourselves and our children from the menace of the presence in the Net of nudity, sex acts, drugs, alcohol, tobacco, violence and profanity, cults, racist, extremist, and intolerant groups, illegal gambling and fraudulent business ventures? The challenge here is how we can balance our quest for freedom and

openness with the need to curb porn, obscenity, and intolerance.

That is the greatest dilemma libraries offering public access to the Internet face. Whereas almost all public libraries in the USA provide free Internet access to their readers, the situation is abysmal in almost all developing countries.

As Nancy Kranich has said, public access to the Internet is vital to rekindle civic participation, and to claim for public space and to promote the public interest in the digital age.

There are two ways of promoting public access to the Internet:

- Enabling citizens the world over to use the tools of the information network to gain access to available information, as well as to create their own information and circulate it worldwide.

- Ensuring free access to essential information, so that the opportunities provided by the Internet are actually used to spread throughout the world access by all to knowledge.

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