

Research Report No. 6

**Portal Sites:
Emerging structures
for Internet control**

S.M. Hinton

January 1999

La Trobe University Online Media Program

The La Trobe University Online Media Program undertakes social and policy research related to the development and regulation of online media services. There are three strands of research.

Research Strand 1: New Media and Communication Environments.

Organisational, regulatory and technological change is occurring at such a rapid pace that it is difficult predict what the future new media landscape will look like. Service providers are uncertain about the potential markets for rapidly evolving and new services. This strand of research examines the development and adoption of new services.

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The shape of the media, communication, publishing and computing industries is rapidly changing. Most of those changes are being brought about through strategic alliances between discrete elements of multi-functional and often competing organisations, and linkages with smaller start-up companies which have developed innovative products and services. For the first time "carriers" are having to pay attention to "content", software-based services and consumer electronics. These industry changes are occurring as the various industries "internationalise" and as governments remove layers of regulatory control. This strand of the research program examines the restructuring of media, communication, publishing and computing industries and considers the implications of those changes for industry participants and government policy.

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Abstract

Portal sites are Web sites – places on the Internet – designed primarily to attract large numbers of Internet users, and from this, to generate revenue through advertising and ultimately the sale of goods and services. Over the course of 1998 and 1999, fierce competition between portal sites has led to their development into specialised ‘transactional spaces’ that aim to mediate the Internet user’s entire online experience, from sending and receiving email, to locating content and publishing their own content.

The emergence of these portal sites represents a significant stage in the development of the Internet, and moves a substantial way towards establishing the Internet as a commercial mass medium on par with conventional forms of mass media. This report charts the development of portal sites, and aims to place them in the overall context of the ongoing development of the Internet.

In Chapter One, it is suggested that resource discovery in a smaller pre-commercial Internet was supported by user communication and a limited number of software tools. Chapter Two suggests that resource discovery has become problematic since the Internet has become commercialised because the amount of available information has increased and there has been a significant increase in less experienced fee-paying users. Portal sites are seen as a logical extension of this development, and are described in detail in chapter three. Chapter Three shows how portal sites have developed, and identifies the main stakeholders involved. Chapter Four examines some of the implications that portal sites hold for the Internet. It is argued that portal sites constitute a form of ‘transactional space’, establishing themselves as both user destinations and content providers in their own right rather than simply providing a navigation function, a development that has implications for the future of the Internet and the way people use it.

The report concludes that while it is still too early to make predictions about the possible long term effects of portal sites on the Internet – it is not even certain that portal sites (or their descendants) will be able to meet challenges such as the viability of the advertising model or the possibly fickle usage habits of tomorrow’s more experienced Internet user. However, when viewed in context with the history of the Internet and its ongoing commercialisation, one thing is clear: portal sites are part of a much larger game for control of the Internet that has only just begun.

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Chapter 1

The pre-commercial Internet

This chapter examines the development of the pre-commercial Internet and the nature of its users. It explores the origins of the Internet before building a profile of the pre-commercial Internet user, showing where these users came from, and which common traits many of them shared. The chapter then goes on to examine how Internet content and resources were located and discovered by users of the pre-commercial Internet. Due to the fact that the Internet developed first in the US, the discussion will focus primarily on the US experience.

Origins of the Internet

The Internet developed from the coalescence and interconnection of a number of computer networks. The term 'internet' is short for 'internetwork', which is defined by computer science as "two or more networks using different networking protocols connected by means of a router". The proper noun 'Internet' refers to the interconnection of a number of networks across the world, to form one super-internetwork¹.

Government funded computer networks

The networking technology that the Internet relies upon was initially developed by the Advanced Research Projects Agency (ARPA, later renamed to DARPA), an agency established in 1958 in response to the perceived threat of Soviet technological superiority². The Internet was made possible by a great deal of groundbreaking work carried out through funding made available by ARPA to various research institutions in the 1960s and 1970s. The results of this work went into the establishment of a computer communications network called ARPAnet, which was designed to link geographically remote computers located in universities which were engaged in research funded by United States defence contracts.

One of the most important – and required – aspects of ARPAnet's design was its ability to link mainframe computers of differing and incompatible operating systems and hardware to each other. The first networked computers (nodes) in ARPAnet – one at the University of California, Los Angeles (UCLA) and the other at the Stanford Research Institute (SRI) – first exchanged data in October 1969³.

Access to ARPAnet was restricted to research organisations which had defence contracts, which placed some organisations in a privileged position. As ARPAnet access was proving very useful to researchers, a research network for non-defence contractors called CSnet, was constructed from National Science Foundation (NSF) funds⁴.

By the mid 1980s, ARPAnet was beginning to show its age, and a new faster network, also funded by the NSF and called NSFnet, was developed to connect the main US university based supercomputers, and to provide a network infrastructure for the academic and research community that was isolated from defence networks. When ARPAnet was shut down in 1987, two of its nodes were subsumed by MILNET (the US Defense department's computer network) while the other nodes were connected to the new NSFnet⁵. NSFnet was the key to the development of today's Internet, a point which shall be explored further below.

¹ Peter Dyson, *Dictionary of Networking, 2nd ed.ition*, Network Press, USA, 1995, p. 170.

² K. Hafner and M. Lyon, *Where Wizards Stay Up Late: The Origins of the Internet*, Simon and Schuster, New York, 1996, p.14.

³ *ibid.*, p.151.

⁴ Initially CSNet was developed as a network for computer scientists (hence CSnet - Computer Science). However, use by members of the scientific research community more generally led to the name Computer and Science network (see Hauben, M. and Hauben, R., *Netizens: on the history and impact of USENET and the Internet*, IEEE Computer Society Press, USA., p. 50)

⁵ K. Hafner and M. Lyon, p. 256.

USENET, non-profit networks and bulletin boards

Outside of the large, federally funded networks of ARPAnet and NSFnet, a number of smaller networks emerged which were accessible to a much larger audience. Without the large amount of funding committed to the major networks like NSFnet, these smaller networks were funded by local communities of universities, libraries and schools, and they were based on a low cost architecture.

One of the most important low cost networks was USENET. Sometimes referred to as “the poor man’s ARPAnet”, USENET exploited telephone lines to transfer data from one computer to another, and was made possible by the advent of smaller, cheaper mini- and micro-computers and the UNIX operating system. USENET computers would dial other known USENET computers and exchange information with them, once or twice a day. As a result, users of a USENET computer would get fresh information – email, files, news – once a day, and once a day their information would go back to another USENET computer.

At points where a USENET computer was part of a larger research organisation with access to, say, ARPAnet, it enabled communication between ARPAnet users and USENET users⁶. As a result of its relatively simple design and its cost-effectiveness, USENET became an important link between various distributed online users, and thus one of the main arenas in which users of the pre-commercial Internet were able to communicate.

As computers became smaller and cheaper in the 1980s, networks based around Bulletin Board Systems (BBSs) increased in number, and became important points for communication within and between a number of sub-cultures. BBSs are computers (often a micro-computer sitting in someone’s home) which have been set up to accept incoming data calls. Thus, individuals with a computer and a modem of their own can ring a BBS and exchange digital data with it.

Typically, bulletin boards are used to send and receive digital data such as electronic mail, computer software or digital images. Unlike the Internet, users wishing to contact international bulletin boards would be forced to make expensive international phone calls, although some data, such as electronic mail, could be transferred by USENET-like networks such as Fidonet⁷.

USENET, most community funded networks, and many BBSs connected to the Internet over time as technical development made access easier and cheaper. As each network connected, the groups that each network supported also became part of the Internet, each contributing different aspects to a growing community of Internet users. The following section explores some of these groups and their values in more detail.

Pre-commercial Internet users

Just as the Internet developed from the interconnection of a number of computer networks, so too the collective of Internet users can be seen as consisting of a number of interconnected user groups from the constituent networks who were able to mingle within the common ‘cyberspace’ the Internet afforded. The linking theme between each of these user groups is that many of them were drawn to computer mediated communication technologies, such as ARPAnet or USENET, community networks or bulletin boards, to support various special and expert interests. Some of these interests are examined below.

The academic research community

The academic research community – especially computer scientists and students – formed the earliest network-based cultures on networks such as ARPAnet and CSnet. Although funded primarily for research work, discussions on decidedly recreational topics such as science fiction existed on ARPAnet⁸. Hafner and Lyon point out that although ARPAnet was

⁶ It is important to recognise that USENET did not provide a network connection to ARPAnet as such. A USENET user could only see information that people from ARPAnet sent to USENET - they could not arbitrarily access ARPAnet data.

⁷ Fidonet. *Fidonet*. <http://www.fidonet.org/>.

⁸ M. Hauben and R. Hauben, p.52.

originally intended for computer resource sharing, it was used far more as a communications network, and that between 1972 and 1980 email was “discovered by thousands of early users”⁹.

Computer enthusiasts

Although forming the central hub of the Internet, academia was not the only group which influenced the development of the pre-commercial Internet. Appearing with the development of micro-computers in the 1970s, home computer hobbyists were one of the earliest computer using groups outside of academic institutions. Up until this time, mainframe computers were large and expensive, and their use was restricted to experts who worked with the computers in environments such as academic institutions, large businesses or the government.

The first micro-computers that people used at home were very simple by today's standards, and although limited in practical application, nonetheless drew a faithful crowd of tinkerers and hobbyists who were fascinated by the technology. Early home computers were sold as kits, which the home enthusiast would assemble themselves, usually with a soldering iron and a great deal of patience. United by this common interest, a culture of home computer enthusiasts grew, and continued to grow as the computers they used became more complex. These enthusiasts often operated or participated in BBSs and other computer networks such as USENET, as they were an important medium for the exchange of specialised information, especially about computing, but not necessarily limited to computing¹⁰.

Subcultures and virtual communities

Computers also provided the network infrastructure upon which members of other groups could communicate. Writers such as Howard Rheingold have identified the development of virtual communities in many of the early networks, including bulletin boards¹¹. One such bulletin board system, established in 1985, was the WELL (Whole Earth 'Lectronic Link) which grew out of the Whole Earth Catalogue as a means of “providing access to tools and ideas to all the communes who were exploring alternate ways of life in the forests of Mendocino or the high deserts outside Santa Fe”¹².

Rheingold notes that the communities that formed on the WELL extended beyond the immediate target alternative lifestyle community, including “young computer wizards” and “grizzled old hands who were still messing with mainframes”¹³, as well as a subculture based around the band ‘The Grateful Dead’. Another important group of users that grew on the WELL and used it as a forum for communication consisted of journalists from media such as *The New York Times*, *Business Week* and *Rolling Stone*¹⁴.

Closely associated with Rheingold's ‘young computer wizards’ was the sub-culture of phreakers (people who used the phone system illegally), computer crackers (people who attempted to gain unauthorised access to computer systems) and software pirates (people distributing illegal copies of copyrighted software). These groups used bulletin board systems to communicate with one another and share information. While they were relatively small, they generated a great deal of attention from civil liberties groups and the media as a result of a number of raids carried out by US Secret Service agents during ‘operation Sun Devil’ in

⁹ K. Hafner and M. Lyon, p.189.

¹⁰ Christopher Lindquist, ‘Ferret Lovers Unite - And Download’, *Computerworld*, vol. 25, no. 32 (August 12, 1998), p. 88.

¹¹ Rheingold, H, *Virtual Communities: homesteading on the electronic frontier*. Addison-Wesley. Reading, Mass, 1993.

¹² Rheingold, H. “A Slice of My Life in My Virtual Community” in P. Ludlow (ed), *High Noon on the Electronic Frontier: Conceptual issues in cyberspace*, MIT Press, Cambridge, MA, 1996, p.428.

¹³ *ibid.*, p.429

¹⁴ *ibid.*, p.430

1990¹⁵. The spectre of the computer cracker continues to be a popular theme in both fiction and news media.

These few examples provide a brief (and somewhat US-centric) overview of the kinds of groups involved in computer-based communications networks. The following section will illustrate the main traits that can be said to have emerged from these groups.

Main traits

The anarchic nature of the Internet makes generalised claims about the nature of a homogenous group of pre-commercial Internet users difficult to substantiate, as there is no central authority which one can identify as the voice of the Internet. As suggested above, the pre-commercial Internet user community was a melange of sub-cultures and special interest groups. However, from this heterogeneous mixture of users, certain beliefs could be identified as being common to many of them, and from these shared beliefs, at least five general traits could be distinguished.

First, for most pre-commercial Internet users, the medium was primarily about social communication. This may seem obvious, but the network could just as easily be about transmission of software updates or, in the case of ARPAnet's original design, to facilitate computer resource sharing. However, where computers were used to establish data networks, whether it be in the form of government funded networks, or small bulletin board systems, communication between individuals, mediated by computers was been paramount. Thus, a desire to communicate must be seen as one common trait of the groups that used the pre-commercial Internet.

Hauben and Hauben believe that people have a "communal wish" to communicate with others¹⁶, and further claim that this wish led to the growth of the network because more participation leads to more communication and thus a greater variety of information (which, of course, leads again to greater participation).

The second shared trait was a belief in the value of collaboration and cooperation. The Internet has been called a 'gift economy', where an individual participates by giving away information in the hope that perhaps at some later time, someone else is giving away information that they will find useful¹⁷. The Internet Society (ISOC) supports cooperation in its Guiding Principles policy:

*"Encouragement of cooperation between networks: Connectivity is its own reward, therefore network providers are rewarded by cooperation with each other"*¹⁸.

Rules for online interaction called 'netiquette' (literally, 'net etiquette'), developed in a number of online fora, such as USENET and the WELL, which were designed to keep the network operating efficiently. These rules were largely designed around common sense and a principle of respect for other users¹⁹. Most users obeyed the basic rules of netiquette, mainly because it benefited them to do so, and because they were motivated by a desire to communicate and share information. The Netscape Web browser even incorporated a built-in link to netiquette information under its 'help' menu.

The third trait of pre-commercial Internet users was a strong desire to avoid centralised control or regulation (or at least, to promote self regulation). Where there was a practical need for a central authority – for example, to oversee the development of technical

¹⁵ John Perry Barlow, 'Crime and Puzzlement' in P. Ludlow (ed), *High Noon on the Electronic Frontier: Conceptual issues in cyberspace*, MIT Press, Cambridge, MA, 1996, p.467.

¹⁶ M. Hauben and R. Hauben, p.55.

¹⁷ H. Rheingold, 'A Slice of My Life in My Virtual Community', p.425.

¹⁸ Internet Society. *Internet Society Guiding Principles*.
<http://www.isoc.org/isoc/mission/principles/>

¹⁹ For an example of netiquette rules, see Albion.com. *Netiquette Home Page*.
<http://www.albion.com/netiquette/index.html>.

standards in the case of the Internet Engineering Taskforce (IETF) – a strong commitment to openness and consultation is easily seen in policy documents. Indeed, the IETF claims that “anyone can submit an RFC”²⁰. The first Request for Comment – RFC 1 – was posted in 1969. By September 1998, over 2,400 RFCs had been posted by a variety of authors, ranging from individuals to large corporations²¹.

Resistance to regulation and centralised control is one of the better known aspects of pre-commercial Internet users. Attempts by governments – both US and external to the US – to regulate the Internet have met with strong opposition from the Internet community. In 1996, in response to the passing of the Telecom Reform Act by the US senate, John Perry Barlow, co-founder of the Electronic Frontiers Foundation (EFF)²² drafted what he called “A Cyberspace Independence Declaration”²³. This document outlines many of the ideas that pre-commercial Internet users held with respect to issues of governance and control, and expresses the outrage that many users of the pre-commercial Internet felt.

The fourth trait identified here as common to the pre-commercial Internet users is a general belief that information should be free. This concept had two meanings. On one hand, the concept referred to the producer of information, and was tied closely to notions of freedom of speech. On the other hand, the belief encompassed the far more anarchic concept that “information wants to be free”, a phrase often attributed to Whole Earth Catalogue and WELL founder Stewart Brand, and one that was certainly taken strongly on-board by software pirates and those who questioned the notion of intellectual property rights²⁴.

It is the fifth and final trait that is perhaps the least strongly held amongst all pre-commercial Internet users, but which differentiates the pre-commercial Internet user from the user of the commercial Internet, as described in chapter two. This final trait was a resistance to commercialisation.

From its inception, use of ARPAnet for purposes outside of defence research work was forbidden. When the NSF established NSFnet, an Acceptable Use Policy (AUP) was enforced which explicitly prevented use of NSFnet for commercial traffic. Items 10 and 11 in the NSF AUP stated:

“UNACCEPTABLE USES:

(10) Use for for-profit activities unless covered by the General Principle or as a specifically acceptable use

(11) Extensive use for private or personal business”²⁵

As data from all networks that formed part of the Internet needed to traverse the NSFnet backbone in order to communicate with other networks, the policy effectively prevented commercial use of the Internet until it was removed in 1995 (see Chapter 2).

This non-commercial attitude was not confined to the owners of government funded networks. Fidonet, one of the most popular means for bulletin boards to share information, was established by Tom Jennings, primarily as a hobby:

²⁰ Internet Engineering Taskforce, *RFC Overview*, <http://www.rfc-editor.org/overview.html>. An RFC (Request for Comment) is a document that proposes a new technical standard, or a change to an existing one.

²¹ USC Information Sciences Institute, *Index of /in-notes/*, <http://www.isi.edu/in-notes/>.

²² Electronic Frontiers Foundation, *About EFF*, http://www.eff.org/EFFdocs/about_eff.html.

The EFF (see <http://www.eff.org/>) was founded in 1990 to “to protect fundamental civil liberties, including privacy and freedom of expression, in the arena of computers and the Internet”.

²³ Please refer to Appendix A for a copy of Barlow’s 1996 email containing the declaration.

²⁴ See, for example, Chapter I of P. Ludlow (ed), *High Noon on the Electronic Frontier: Conceptual issues in cyberspace*, MIT Press, Cambridge, MA, 1996.

²⁵ M. Hauben and R. Hauben, p.220.

"[Fidonet] is a hobby, a non-commercial network of computer hobbyists [sic] ("hackers", in the older, original meaning) who want to play with, and find uses for, packet switch networking. It is not a commercial venture in any way; FidoNet is totally supported by it's[sic] users and sysops, and in many ways is similar to ham radio, in that other than a few "stiff" rules, each sysop runs their system in any way they please, for any reason they want."²⁶

The success of USENET was similarly due to the work a number of committed individuals, for whom developing and maintaining a communication network was a labour of love.

To summarise, then, the users of the pre-commercial Internet were generally part of various employment groups (for example, academics from the sciences) or sub-cultures (alternative lifestyle groups in California, for example) who used the medium as a way facilitate communication between group members. Because the technology was far less user friendly than today's Internet technology, and also because many users were from technical backgrounds, users were generally quite technically adept.

From these groups, a number of common traits emerged: a willingness to communicate, a belief in the importance of cooperation and collaboration, a resistance to centralised control and regulation, a belief that information should be free, and finally, a general non-commercial, and at times an anti-commercial outlook. These traits had a strong impact on the way people used the pre-commercial Internet, especially as it applied to discovering and locating online resources.

Resources and resource discovery in the pre-commercial Internet

Resource discovery is an important issue in a distributed medium. In the cooperative, communication oriented and predominantly academic environment of the pre-commercial Internet, resource discovery was a lot more like research than asking an oracle. While technological solutions existed to help locate some forms of information, such as popular files held on FTP archives and people's email addresses, resource discovery was still predominantly performed via direct or indirect communication with other, more seasoned Internet users.

Technological solutions

Basic technological solutions for locating some kinds of information in a distributed environment have been around for as long as distributed networks. Most relied upon accessing a single known server that provided an interface to some kind of indexing service. Two typical examples of pre-commercial resource discovery tools are finger servers and Archie servers.

Finger servers were available on many machines, and allow users to communicate with a text only interface (command-line interface) to query the computer about users with accounts on that machine. If, for example, you knew someone called Bob Smith had an account on a machine called defeat.theb.org, you could connect to defeat.theb.org and request a list of email addresses for people with accounts on that machine whose surname was 'Smith'. Using the finger server, one could also determine other information about the user, including whether they were currently logged in.

Another pre-commercial resource discovery server is 'Archie'. Popular archives of files available for downloading, for example, could employ a service called 'Archie', which was a command-line interface which could be queried for information about files held in a number of registered archives (but not all archives) in machines worldwide. By connecting to a known Archie server, a user could request a list of all known file archives which contained a particular file they were interested in. The information returned by Archie would be enough for the user to then use software to connect to the archive located by Archie and retrieve the file.

²⁶ Tom Jennings, *History of Fidonet*,
http://www.scms.rgu.ac.uk/students/cs_yr94/lk/fido/fhist.html.

Community and communication

While resource location tools like Archie and finger were useful, they are not true resource discovery tools: the user must already have an idea of what they want to look for: a particular file or a particular person. If the query was more vague (for instance, the user wanted to find the email address of someone with similar interests to them, or if they wanted to find a text editor program) then these location tools were not very effective. Similarly, a user needed to know which computers the tools were located on in order to connect to them and use them.

The hurdle this introduced was best overcome by asking someone else – a colleague at work, or someone online whose email address you knew – where a resource was located. New users, dubbed ‘newbies’, were often asking questions, and helping newbies get acquainted with the rules and technical details of the Internet was considered something of a civic duty for any experienced user.

As might be expected, discussion fora like USENET and mailing lists (mass delivery email) were obvious places for new users to make such inquiries. In order to prevent basic questions being asked over and over again, Frequently Asked Questions (FAQ) lists were generated and regularly posted to USENET groups and many mailing lists by list owners, moderators or public spirited individuals. Netiquette demanded people read a group’s FAQ before asking questions, and in many lists failure to do so often resulted in a severe response from list participants.

In the cooperative group based pre-commercial Internet, it was likely that a new user would know other experienced users, which made the system of learning and resource discovery through communication with other users quite effective. While this system worked well for small groups of keen enthusiasts, it relied heavily upon cooperation, the fact that the demand created by people needing information could be supplied by those who had the answers, and that the total amount of information was small enough that people could realistically be expected to answer most queries. The following chapter will examine the growth of Internet commercialisation, and will suggest that for users of the commercial Internet, resource discovery has become problematic.

Chapter 2

Internet commercialisation

During the 1990s, the Internet has been progressively commercialised, notwithstanding its non-commercial roots. Commercialisation allowed businesses called Internet Service Providers (ISPs) to sell Internet access to individuals and other businesses, that has opened the Internet to a much wider audience. It also made it possible for commercial organisations to use the Internet for business purposes. This, in combination with the development of the World Wide Web (WWW) has led to a burgeoning Internet user population of mostly inexperienced, non-expert fee-paying users who do not necessarily share the same values as pre-commercial Internet users.

This chapter examines the transition from the pre-commercial Internet to the commercialised Internet, and identifies the effect this had upon users. It is suggested that to new users of the commercialised Internet, timely access to Internet content is a major concern, because of the burgeoning resources available on the Internet and as a result, sites that support effective resource discovery have come under increasing demand.

Commercialisation of the infrastructure

The first step towards commercialisation of the Internet took place through the privatisation of government funded network infrastructure, and then the opening of the infrastructure to commercial traffic.

Privatisation of the NSFnet backbone

In July 1988, the first semi-commercial involvement in NSFnet began when the Michigan Educational Research Information Triad (MERIT) was awarded a five year contract for installing and managing the proposed National Research and Education Network (NREN), a high speed educational network proposed to link NSFnet, NSInet (NASA), ESNet (Department of Energy), and MILNET (Department of Defense). IBM and MCI were named as "joint study partners"²⁷ to MERIT in this venture.

This was an important development, because the telecommunications infrastructure that this new national backbone was to be built upon was privately owned, unlike ARPAnet or NSFnet. In September 1990, IBM and MCI established a company called Advanced Network and Services (ANS) primarily to manage the network they were installing. Shortly after this, the NSFnet management performed a curious policy back flip. MERIT's responsibilities for managing the new backbone infrastructure was transferred to ANS and it was "agreed that ANS should seek commercial users"²⁸. After a number of articles were published in *Communications Daily* in early 1992 about this incident, a Congressional hearing was called by Representative Rick Boucher. However, a report from the Office of the Inspector General for the NSF found that it was within the NSF's scope to make such changes to its policy, and the matter was dropped.

Thus, by 1992, ANS was running the NSFnet backbone services, and the NSFnet Internet backbone had been effectively privatised. This did not mean, however, that the NSFnet backbone was open to commercial use.

Relaxation of acceptable use policies

As discussed in Chapter 1, the basic network infrastructure that developed into the Internet was funded and supported by non-commercial agencies and Acceptable Use Policies prohibited the use of the NSF backbone for commercial purposes. Even though acceptable

²⁷ Gordon Cook, 'A National Network That Isn't', *Computerworld*, vol. 26, no.10 (March 9 1992), pp. 91-95.

²⁸ M. Hauben and R. Hauben, p. 218.

use policies were in place by 1989²⁹, by 1992 they had become practically unenforceable due to the NSF policy back flip and the privatisation of the backbone. By then, there was already growing dissatisfaction with placing limits on the use of the NSFnet backbone, and a number of groups were suggesting that the policies be relaxed.

At the House Science, Technology and Space subcommittee oversight hearing on NSFnet management called by Representative Boucher in response to the NSF policy back flip, the NSF networking director was quoted as saying “If Congress allowed us to relax it [the NSFnet AUP], we'd go along with it ... A policy of unrestricted access would allow the network to exploit economies of scales.” At the same hearing, Mitchell Kapor from the Electronic Frontiers Foundation (and perhaps more importantly, founder of the Commercial Internet Exchange – see below) expressed a belief that the “acceptable-use policy should be dropped”³⁰.

Networking developments were also occurring in the private sector. A number of private companies, both in the US and abroad (UUnet Technologies, Sprint and significantly, ANS in the USA, SWIPnet in Sweden, Pipex in the UK) were established through the late 1980s and early 1990s to provide businesses with access to what has been called the Public Data Internet (PDI)³¹. Traffic within these networks could be commercial in nature as long as it did not pass across or into a network in which commercial data was prohibited, such as NSFnet.

In order to interconnect these PDI business networks, the Commercial Internet Exchange (CIX), a consortium of PDI access providers, was established by Mitchell Kapor, founder of the software company Lotus and president of the Electronic Frontiers Foundation. The goal of CIX was to provide a backbone network for commerce like the NSF had for research.

Because MCI owned the physical cabling and hardware that NSFnet now consisted of, ANS were allowed to run commercial traffic over the lines as well as non-commercial academic traffic. PDI (commercial) traffic was considered part of ANSnet that was handled by a subsidiary of ANS called CORE (Commercial Research and Education), while traffic from non-commercial subscribers was considered NSFnet traffic. Throughout the period between the privatisation of the NSFnet backbone and the final withdrawal of government subsidies for NSFnet in April 1995, a number of companies, most of them members of the CIX, developed mid-level networks that enabled the flow of commercial traffic between commercial networks.

With the end of substantial government funding of NSFnet, the acceptable use policies were finally dropped, and PDIs were able to start offering Internet access more freely. The virtual monopoly that ANS had been granted through their placement as overseers of the NSFnet backbone was broken. This allowed three major players – Sprint, MCI and ANS – to emerge as major commercial providers of access to the Internet, with competition growing from UUNET, Netcom and Compuserve³².

Internet service providers

An important result of Internet commercialisation was the emergence of commercial organisations – Internet Service Providers (ISPs) – that sell Internet access to businesses and individuals. This growth in ISPs opened the Internet to anyone with a computer, a modem and the money to spare to pay the ISP's subscription fees.

Broadly speaking, ISPs have developed in four ways: as extensions to existing telecommunications companies such as MCI, Sprint and ANS, from proprietary online

²⁹ *ibid.*, p. 219.

³⁰ Ellen Messmer, 'Users Question New NSFNET Usage Policy', *Network World*, vol. 9, no. 13 (March 30 1992), pp 19-20.

³¹ Robert D. Collet, 'The role of public data Internet service providers in corporate information networking'. *Telecommunications*, vol. 27, no. 1 (Jan 1993), pp. 50-52 (Americas Edition); pp. 52-54 (International Edition).

³² Michael Cooney, *et. al.*, 'Internet surge strains already shaky structure', *Network World*, vol 12, no. 14 (April 3, 1995), p. 67.

service providers such as Prodigy or CompuServe, from some bulletin board systems, and in the form of new businesses that have been established to provide Internet access.

Essentially, because of the cost of maintaining the top level and mid-level network infrastructure, investment was limited to the largest telecommunications companies. Businesses connected directly to the Internet through leased connections to the major access providers, and some of these businesses competed with the major access providers in supplying individuals or small companies with dial-up or leased line Internet access.

This structure enabled ISPs offering relatively inexpensive dial-up Internet access to appear across the United States. America OnLine (AOL), originally a proprietary online service competing with companies like Prodigy and CompuServe, changed its direction to focus on provision of Internet access, a successful strategy that has propelled it to one of the United State's largest ISPs³³.

Growth of the commercial Internet

The growth of the commercial Internet can be charted by examining the growth in the .com domain name. All computers attached to the Internet must belong to a domain, and a domain name contains information about what organisation the computer is from, and the type of domain – *com* for a commercial company, *edu* for an educational institution, *net* for an organisation that supplies network access or infrastructure, and so on. For example, a domain name like *fred.firstuni.edu* would correspond with a computer called *fred*, located within the domain of an organisation called *firstuni*, which is an educational institution³⁴.

A survey carried out regularly by Network Wizards³⁵ shows dramatic growth in the Internet, particularly in the commercial (.com) domain of the Internet from around 1994.

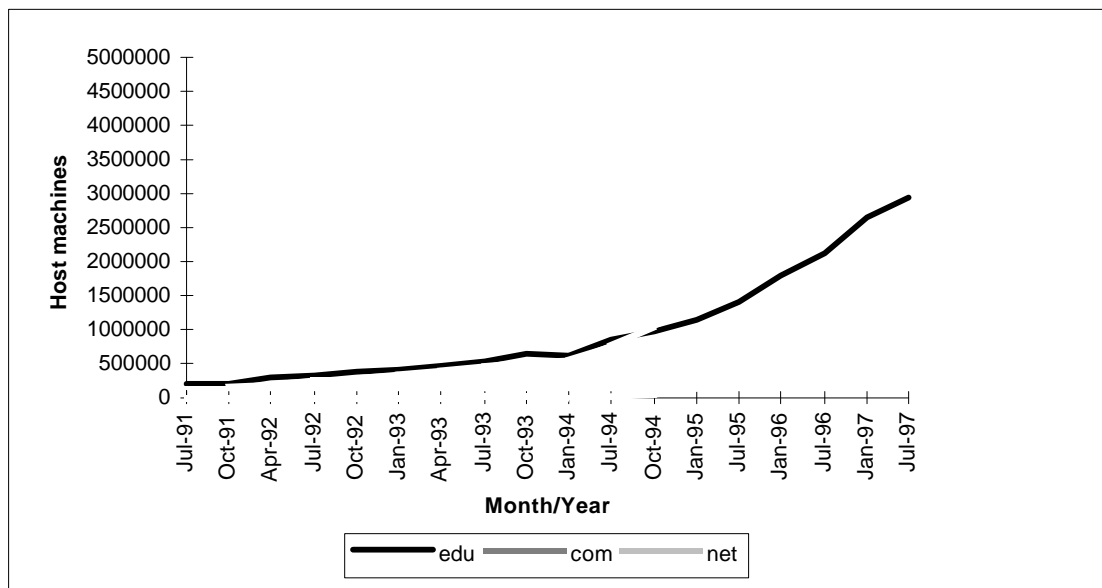


Figure 1 – Growth in Internet Domains July '91 to July '97

The World Wide Web

Almost by accident, the World Wide Web (WWW, or 'Web') was developed at roughly the

³³ AOL is regularly listed in the top four of five ISPs. See, for example, CNet's special report on ISPs at <http://www.cnet.com/Content/Reports/Special/ISP/ISPs.ag/index.html?st.cn.ISPrc.cnt4.gp>.

³⁴ Note that computers in countries other than the United States must also specify a country identifier: .au in the case of Australia. Thus, an Australian university would be something like *fred.firstuni.edu.au*.

³⁵ Full details of how the survey is carried out is available in RFC 1296. See M. Lottor, 'Request for Comment 1296'. <http://www.isi.edu/in-notes/rfc1296.txt>.

same time as the Internet was commercialised. The Web has played an important role in Internet commercialisation by making the Internet much easier to use, and therefore much more attractive to a large audience of non-expert users. This section examines the development of the Web, the change in focus from proprietary services to the Web, and, finally, the role the Web has played in Internet commercialisation.

Development and overview of the Web

The Web has become so ubiquitous that many people use the terms 'Web' and 'Internet' interchangeably. Prior to the development of the Web, the Internet was mostly text based. Access was often via a terminal interface into which a user would type commands to run programs, transfer file or send email. The Web allows the retrieval of HTML documents – files that can include text, graphics, sound or video – that open the way for a number of exciting interactive applications. Importantly, HTML documents can contain 'hyperlinks' – words interspersed with normal text that can be activated by the user to request other HTML documents. The simplicity of this approach allows Internet users to dispense with the arcane commands of the UNIX operating system³⁶.

Web browsers are the software that provide the interface between the user and the network. The most popular browsers are Netscape Navigator and Internet Explorer³⁷. The browser software not only provides access to the Web, but also integrates various other Internet protocols such as Gopher (a forerunner to the Web) and the File Transfer Protocol (FTP, one of the early network data transfer protocols developed in 1972 that allows users to send and receive digital computer files).

Reflecting its acceptance among Internet users, the Web has grown at a remarkable pace, doubling in size in a matter of months rather than years. Table 1 shows the growth of the Web, based on statistics maintained by Matthew Gray at the Massachusetts Institute of Technology³⁸.

| Date | Number of Sites |
|-------|-----------------|
| 6/93 | 130 |
| 12/93 | 623 |
| 6/94 | 2,738 |
| 12/94 | 10,022 |
| 6/95 | 23,500 |
| 1/96 | 100,000 |
| 6/96 | 230,000 (est) |
| 1/97 | 650,000 (est) |

Table 1 – Growth of the Web 1993 to 1997

³⁶ T. Boutell, 'World Wide Web FAQ', <http://www.boutell.com/faq/oldfaq/index.html>. Boutell's description of the Web is one of the earliest and most technically correct.

³⁷ Jesse Berst, 'The Web Browser War is Over: Here's who won', *ZDNet Anchordesk*. August 20, 1998. http://www.zdnet.com/anchordesk/story/story_2442.html.

According to statistics generated at www.whichbrowser.com, over 98per cent of the browsers in use are either Netscape or Internet Explorer. According to Berst's article, figures indicated that 52per cent of users use Netscape, while a further 46per cent use Internet Explorer - roughly the same.

³⁸ Matthew Gray. *Web Growth Summary*. <http://www.mit.edu/people/mkgray/net/web-growth-summary.html>.

From proprietary services to the Web

Intense commercial interest in the Internet did not start until the mid-nineties, commensurate with the final relaxation of acceptable use policies, and the development of the Web. Before then, the focus of potential online commerce opportunities was in proprietary services, mainly because the pre-Web Internet was difficult to use, and still restricted primarily to non-commercial use. In the absence of a popular open network like the today's Internet, online information companies such as CompuServe and Prodigy in the United States successfully provided subscription based access to proprietary online services.

The Internet was not seen by some as a serious infrastructure upon which to develop applications for electronic commerce, and was viewed instead as an unregulated anarchy run by "propellor-heads"³⁹. In 1995, for instance, Microsoft launched the Microsoft Network (MSN), a proprietary network designed as the crucible for the future of online commerce. However, later that year Microsoft began modifying its strategy to face new competition from the Internet⁴⁰.

As commercialisation opened the Internet to the community, many users began to perceive the Internet as an alternative to proprietary online services. Although the Internet was more difficult to use, it was cheaper to access, and it had a kind of wild frontier feel to it. In response to the growing interest in the Internet, CompuServe was forced in 1996 to start providing its subscribers with access dial-up only to the Internet⁴¹, and by 1997, CompuServe had shifted its primary business focus to the Internet, rather than the provision of proprietary information resources⁴², and finally was bought out in a complex deal between AT&T WorldNet and America OnLine in September 1997⁴³.

The Web's role in Internet commercialisation

One of the most important aspects of the Web is that it provides a basic interactive platform upon which other technologies can deliver information or services to the user, and importantly, from which users can send information to various services. Thus, a Web page may consist of text, graphics, buttons, text entry fields or any combination of these objects. This design makes the Web relatively easy to use, and allows a mass audience of non-expert computer users to engage in interactive behaviour with other users or with content providers.

The Web is a major contributing factor to the growth of the Internet – especially the growth of the commercial Internet. Figure 2 shows the variations in percentage growth in the .com domain and the www prefix since July 1991⁴⁴. Domains with the www prefix are, by convention, applied to Web servers, so the growth in the number of www domains is representative of the growth of the World Wide Web.

³⁹ This phrase was used by the director of information systems at the American Petroleum Institute, quoted in Michael Cooney, *et. al.*

⁴⁰ Nick Wingfield, 'Microsoft storms the Web', *Infoworld*, vol. 17, no. 50 (December 11, 1995), p. 24.

⁴¹ Nick Wingfield, 'CompuServe plugs in to Internet access', *Infoworld*, vol. 18, no. 7 (12 February 1996), p. 54.

⁴² Anonymous, 'CompuServe: Internet increases on-line misery'. *Communications International (London)*, vol. 23, no. 10 (October 1996), pp. 54-56.

⁴³ Larry Barrett, 'AOL stock soars on CompuServe news', *ZDNet News*, September 8, 1997, <http://www.zdnet.com/zdnn/content/zdnn/0908/zdnn0001.html>.

⁴⁴ Network Wizards, *Network Wizards home page*, <http://www.nw.com/>. Data is compiled from statistics available from the Network Wizards Web site.

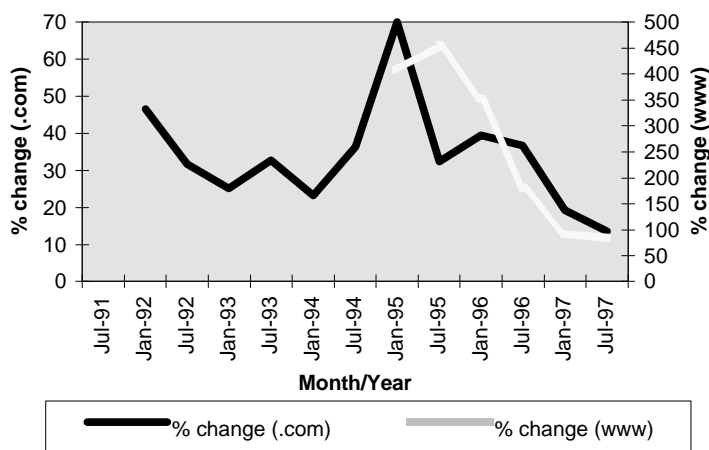


Figure 2 – % Change in Growth of .com and www domains

In the graph above, the percentage change in the .com domain is shown in comparison to the percentage change in the growth of the Web. The key element of this data is the correlation between growth in the .com domain and the introduction of the Web. The *www* machine name is not significant enough to appear in the statistics until January 1995. However, the Web was gaining momentum and popular interest throughout 1994 (the Web accounted for 1 per cent of NSFnet backbone traffic by September 1993⁴⁵, and this was also the month that the Mosaic browser became available on PC, Apple Macintosh and UNIX). From January 1994, the steady growth of the .com domain corresponds with the introduction of the Web into a wider Internet community.

Commercialisation and Internet usage

Chapter one suggested that the pre-commercial Internet was used mainly for communication and knowledge-sharing between members of specific groups – largely those based in research and academia. However, commercialisation has led to a change in the profile of the average Internet user. As will be explained further below, the commercial Internet user pays for their Internet access, are less experienced and are less expert than pre-commercial Internet users.

This change in the profile of Internet users also has an impact on the way the average Internet user uses and perceives the medium. One important and identifiable change is the Internet user's demand for timely access to content. This demand is heightened by the cost of access, while simultaneously content is harder for new users to locate in an ever-growing medium in which new users do not have access to experienced users to help them find information.

The change in the profile of the average Internet user

So far, this chapter has identified how the Internet has become commercialised, and has outlined the Web as a key technology that has complemented this, contributing to the growth of the Internet by making it easier to use and more appealing. But commercialisation has also had an important impact upon the profile of the average Internet user.

Commercialisation has not only increased the number of Internet users, it has also changed a number of characteristics of Internet users. Certainly, surveys indicate that the demographic of Internet users is changing. Where the pre-commercial Internet was dominated by men, 1998 has seen the rapid growth in the number of women coming online⁴⁶.

⁴⁵ World Wide Web Consortium, *A Little History of the World Wide Web*, <http://www.w3.org/History.html>.

⁴⁶ Brock N. Meeks, 'Web demographics changing', *MSNBC*, April 30, 1998, <http://www.zdnet.com/zdnn/content/msnb/0430/311653.html>.

While Internet access continues to be limited to only the richest parts of US society⁴⁷, the average household income and education level of Internet users has fallen from well above average back towards national averages⁴⁸, and in Australia the number of people using the Internet from home has been steadily increasing⁴⁹.

Commercialisation also means more users are paying for their own Internet access, where in the past, users were more likely to have their Internet access subsidised (67 per cent of users paid for their own access in 1998, compared with 51 per cent in 1995)⁵⁰. This is supported by research from the Graphic, Visualization, & Usability (GVU) Center at Georgia Institute of Technology, that states in the findings of its ninth survey:

"Initially, the growth in home use of the web was mainly fueled by people who used the web at work and were transferring use into their homes, making it available to a new set of users (i.e. their families). Results from the last few surveys, however, suggest a new category of users -- a set that specifically seeks out home web access."⁵¹

The rapid increase in users means that the ratio of 'newbies' to experienced users is increasing. For example, in January 1997 there were an estimated fifty-seven million users. By January 1998, this number had risen to 102 million users, suggesting that as of January 1998, 56 per cent of Internet users have less than one year's Internet experience⁵².

Additionally, it is not unreasonable to suggest that users of today's Internet are generally less technically expert than users of the pre-commercial Internet. As ISPs open the Web to a wider segment of the population, the number of users with training in technical disciplines like computer science tends towards a proportion closer to the national average. The fifth GVV survey (April 1996) noted that users from an educational occupation exceeded users from a computer-based occupation for the first time, a trend that has continued to the latest (April 1998) survey⁵³. The Web, as noted above, is much easier to use than the text-based terminal interfaces that preceded the Web, which means that the user does not have to have as much technical knowledge to access Internet content. Similarly, commercial ISPs have streamlined the process of setting up a home computer for Internet access, which means that users need not understand intermediate or advanced computing concepts in order to establish their Internet connection.

Given these indicators, we can surmise that generally speaking, the average user of the commercial Internet is less experienced and less expert than users of the pre-commercial Internet.

New demand for resource discovery

It can be postulated that changes in the profile of Internet users may also lead to changes in user's perceptions of the Internet, particularly concerning their desire to gain access to

⁴⁷ Courtney Macavinta, 'Digital divide growing, study says', *CNET News.com*, July 28, 1998, <http://www.news.com/News/Item/0,4,24691,00.html?st.cn.nws.rl.ne>.

⁴⁸ Graphics, Visualisation and Usability Centre, *GVU Centre's WWW Surveys*, http://www.cc.gatech.edu/gvu/user_surveys/. Based on income statistics taken from Internet surveys conducted between 1994 and 1998 by the Graphic, Visualization, & Usability (GVU) Center at Georgia Institute of Technology.

⁴⁹ Australian Bureau of Statistics (1998) *Use of Internet by Householders*. cat. no. 8147.0. ABS. Canberra.

⁵⁰ Graphics, Visualisation and Usability Centre, *GVU Centre's WWW Surveys*. Data taken from the fourth GVV survey and the ninth GVV survey.

⁵¹ http://www.gvu.gatech.edu/user_surveys/survey-1998-04/reports/1998-04-General.html

⁵² Techmall, *More Than 100 million Internet Users as of January 1998*, <http://www.techmall.com/techdocs/TS980629-6.html>.

⁵³ http://www.gvu.gatech.edu/user_surveys/survey-04-1996/bulleted/general_bullets.html

information in a timely and effective manner.

When asked what the most desirable improvement of the Internet would be, a 1996 study found that the most common answer (two in five responses) was to make the Internet “more user friendly” or “easy/improved access”, “having a map address” or “more powerful search commands”⁵⁴. These findings tend to suggest that in 1996 there was a definite demand for better resource discovery tools and tends to support the contention that resource discovery is an issue for Internet users.

Augmenting this demand is the decreasing efficacy of pre-commercial methods of resource discovery as the numbers of inexperienced non-expert Internet users greatly outnumber the experienced expert users, as suggested above. The frustration caused amongst users in response to an influx of new inexperienced users is best outlined by the backlash America Online has felt against its users and services. As AOL began providing users with access to the Internet, they flooded into online fora like USENET and, because they were inexperienced, breached many of the long standing rules of netiquette. The antagonism this generated was marked by the creation of USENET groups dedicated to slandering AOL and its users.

Even the commercial search engines have become less effective in the ever-growing Web. Search engines which work on the principles of indexing text, build their indexes by scanning text and indexing words in a context insensitive manner. A search for the word “Charlie Chaplin”, for example, returns all documents containing that phrase, because search engines do not provide the user with a means for specifying the context the word or phrase should appear in. Thus, while the user was supposedly searching for information about the famous comedian, the user would also find a number of irrelevant documents, for example, someone’s curriculum vitae that lists “Charlie Chaplin memorabilia” as one of their interests.

Given the growth in complexity of the medium, the increase in non-expert users and the relative decrease in experienced users (and thus the decline in communicative processes as an effective means for resource discovery) and the cost of time taken to locate Internet resources, the demand for effective, timely access to Internet content has grown rapidly. A particularly relevant question arises at this point: what kind of solution can supply such a demand from so many people, and what form would it take?

⁵⁴ J. Katz and P. Aspden, ‘Motivations for and barriers to Internet usage: results of a national public opinion survey’, *Internet Research*, vol. 7 no. 3, (1997), p. 181

Chapter 3

Portal sites

Since early 1998, sites called 'portal sites' have emerged as doorways for users to access Internet content, combining the strengths of search engines with carefully selected content to guide users into an online experience in which the demand for access to content is satisfied. This chapter defines portal sites and examines their development, outlines the major issues that have shaped them to date and identifies the major stakeholders.

Definition and early development

Portal sites are Web sites that are designed to perform two functions. First, they supply the demand for effective resource discovery identified in the previous chapter by giving Internet users tools to locate information (search engines) and by supplying the most accessed services, such as free email and news headlines. Secondly, portal sites concentrate users and create large audiences, thereby generating revenue, typically through advertising, for the portal owner.

It is difficult to chart the development of portal sites, since there is no single date or site that can be identified as the first portal site. Articles referring to "portal sites" began appearing in online magazines like Wired News and ZDNet in late 1997, but an informal review of published articles reveals that the majority of discussion about portal sites did not begin until around February 1998. An Altavista search for the term 'portal site' reveals roughly increasing mention of the term from December 1997 (see Table 2)⁵⁵.

| Month | Number of Documents |
|--------|---------------------|
| Jul-97 | 2 |
| Aug-97 | 1 |
| Sep-97 | 16 |
| Oct-97 | 1 |
| Nov-97 | 7 |
| Dec-97 | 15 |
| Jan-98 | 10 |
| Feb-98 | 18 |
| Mar-98 | 17 |
| Apr-98 | 39 |
| May-98 | 83 |
| Jun-98 | 47 |
| Jul-98 | 399 |
| Aug-98 | 78 |

Table 2 –Altavista documents containing phrase "portal site"

Proto-portals

While literature and Web searches provide some clue as to the emergence of the term 'portal site', it is important to understand that the development of portal sites was not like the development of the Web, that can be pinpointed to the date the first Web server was turned

⁵⁵ Results are based on using the Altavista advanced search query screen and searching for the phrase "portal site".

on. Rather, portal sites have evolved from Web sites that, by virtue of the popularity of the content or services they offered, were attracting large audiences of Internet users.

While many of these popular sites were resource discovery tools, such as search engines, which became popular because of users' need to find locate information, it is important to recognise that search engines were not the only sites that were attracting large audiences and that subsequently developed into portal sites. Two other types of Web site – start pages and content sites – developed into portal sites because they were able to concentrate large numbers of users.

Portal sites can thus be said to have developed from one of three kinds of 'proto-portal' site, each one identifiable by the strategy by which it channels and concentrates users: start pages, navigation sites and content sites. The defining characteristic of portal sites is that they combine aspects of all three of these proto-portals, to form a cohesive Web site that maximises user numbers in a number of ways. These three strategies will be examined in more detail below.

Start pages

The first type of proto-portal is the start page. The owners of the start page proto-portals used Web browser software to leverage their domination of the browser or ISP market and channel their users to their home pages. This is made possible because when a user connects to the Internet and starts their Web browser, the Web browser connects, by default, to a pre-specified Web site. On the two major browsers, this site is the browser company (Microsoft's or Netscape's) home page. However, the start page can also be set to any Web page by the user, or by a third party, such as a hardware vendor or an ISP.

To understand the relevance of this, it is necessary to examine the process by which a new Internet user gets an Internet connection. Typically, Internet users get a connection to the Internet through their work or through their home. To simplify the discussion, only users who obtain Internet access from home will be considered. Of the users who get access from home, some already have a computer and so need to purchase a modem, a subscription to an ISP, and set up the necessary software on their machine to allow them to connect. Other home users buy computers 'Internet ready' that come with all the necessary equipment and software already installed. Often manufacturers of Internet ready computers negotiate deals with an ISP, perhaps giving the user certain benefits, like free Internet access for the first ten hours.

The important detail lies in the software designed to connect the home user's modem to the ISP. Most ISPs provide Internet access software packages to users that automates the quite convoluted process of installing the necessary software components, including a Web browser. At the point in which the Web browser is installed, the Web browser's start page is configured to deliver the user to a start page chosen by the ISP, usually the ISP's start page. Users whose Internet access comes from an Internet ready computer may be directed to the hardware manufacturer's start page, or to the start page of the ISP chosen by the manufacturer.

Given this, unless the user consciously decides to alter the start page, they will be directed to one of three start pages: the browser's start page, the ISP's start page, or a hardware manufacturer's start page. America OnLine (AOL), the largest ISP in the United States claims thirteen million customers⁵⁶, which yields a potentially huge amount of traffic directed towards AOL's start page, AOL.com. Not surprisingly, AOL.com is the second highest trafficked site on the Web⁵⁷.

The two browser companies, Microsoft and Netscape, also have a similar advantage. If a hardware manufacturer or an ISP does not intervene, each company's browser defaults to the relevant corporate home page. This is most likely to occur if the user installs their own

⁵⁶ A. Stone, *et. al.*, 'The Battle of the Portals: Who will be left standing in the fiercest contest in cyberspace?', *Business Week*, 28 August 1998, <http://www.businessweek.com%1998%36%b3594010.htm>.

⁵⁷ Please refer to Appendix B.

Internet software, or installs an updated version of the browser software obtained directly from either Microsoft or Netscape. Thus, the Microsoft start page is the third most trafficked site on the Web, and the Netscape start page, Netcenter, is the sixth highest trafficked site⁵⁸.

Navigation sites

The second type of proto-portal is the navigation site. Navigation sites use a variety of methods to allow users to locate other sites, but do not provide content in their own right. An appropriate analogy is that navigation sites are like the book catalogue in a library: without the catalogue, the library is difficult to use. The most successful navigation sites – search engines – take advantage of the interactive features of the Web, and allows the user to perform automated searches through an index of millions of catalogued Web pages. Using this method, the user can, for instance, specify a word or phrase, and the search engine will provide the user with a list of Web documents that contain that word or phrase.

The history of search engines is worth exploring briefly. The first search engine was Lycos, an experiment run out of Carnegie Mellon University in the US. Lycos was followed by Altavista, established in 1995 by the Digital Equipment Corporation, notable because it was initially developed to showcase their high-end computer hardware, and probably to help generate brand awareness for Digital amongst Internet users, although information from Digital argues that Altavista simply represents part of the company's continuing commitment to research and development⁵⁹.

One of today's most popular search engines, Yahoo, that also grew from a US university (Stanford in this case), did not start out as a search engine, but as a hand entered list of links. Yahoo's hierarchical structure grouped popular content under arbitrary subject headings. While indexing much less Internet content, Yahoo became popular primarily because it was handcrafted, and as a result, the content indexed by Yahoo tended to be of a higher quality and relevance than the indiscriminate indexing of the automated search engines.

As outlined in the previous chapter, navigation sites owe their popularity in part, to the demand amongst users for ways to locate content on the Web. While it is possible to navigate the Web by browsing (exploring links on Web pages), the size and complexity of the Web make it infeasible to do so. By providing a viable means of locating Internet resources, navigation sites have become crucial resources for all users, forming a nexus through which most Web users need to travel, and therefore, a source of great audience concentration. Indeed, both content sites (see below) and start pages rely upon navigation sites in much the same way libraries rely on their catalogues.

Content sites

The third type of proto-portal generates audiences by providing content that is highly popular. These 'content sites' are distinct from navigation sites, because they provide the content that search engines simply provide access to. To return to the analogy of the library catalogue, if the navigation site is the catalogue, then content sites are the books on the shelves of the library. Examples of content sites include sites that provide information, such as online newspapers, as well as sites that provide interactive content and services, such as online shops like bookseller Amazon.com, companies like Hotmail.com that offer free email, and companies like GeoCities.com that offer users free home pages.

While most Internet sites contain content and generate some traffic, few generate audiences large enough to be compared with the major start pages and navigation sites. One of these sites, GeoCities, for example, allows people to establish their own Web pages free of charge. By adding advertising content to its customer's pages, GeoCities attracts advertising revenue while its customers provide the content. Web sites hosted by GeoCities attracted 14.2 million unique visitors in August 1998, more than the popular search engines Infoseek or Altavista⁶⁰.

⁵⁸ Please refer to Appendix B.

⁵⁹ Digital Equipment Corporation, 'About Altavista', http://www.altavista.com/av/content/about_our_story.htm.

⁶⁰ Please refer to Appendix B.

Another content site, Hotmail, offers users free access to email, which its customers can read and send through any Web browser. In August 1998, Hotmail attracted 14.6 million unique visitors, just ahead of GeoCities, making it the seventh most popular Web site⁶¹.

While navigation pages form perhaps the most important component of the Web, they exist in a symbiotic relationship with content. Users need to pass through navigation sites in order to access content, but without content, navigation sites are rendered useless.

The emergence of portal sites

Portal sites have emerged as owners of proto-portals realised the potential for audience generation and advertising revenue, which can be particularly lucrative for the most popular portal sites. Yahoo garnered US\$14.7 million in the third quarter, 1998, while Excite, the next most profitable portal, generated US\$9.9 million in the same period⁶². Competition for users and hence these dollars has led to a convergence in functions and strategies of proto-portals, so that the emergent portal sites have added extra features to their sites to develop a new site that combines the audience channelling strategies of navigation sites, content sites and start pages.

From proto-portals to portals

As the owners of proto-portals began to realise the importance of user concentration, competition for users between the sites began, and many of them upgraded their software and hardware so they would supply a better services, and thus generate more traffic. The search engine Excite, for example, upgraded its search engine towards the end of May 1998, and Lycos followed suit around the same time⁶³. This upgrading of proto-portal software and hardware is similarly mirrored by re-designs of the various Web sites' interfaces, especially throughout June 1998, when Altavista, Excite, Netscape and Microsoft all launched new or re-designed search interfaces⁶⁴.

One of the key characteristics of the transition from proto-portals to portals has been the convergence in functions of the proto-sites. Start pages have added Internet search facilities and content (news headlines, for example). Navigation sites have started trying to establish themselves as user start pages and have added content. Certain content sites have made similar changes to their sites: they have added extra content and search engines. Not surprisingly, as each has tried to successfully compete with the other, this convergence in function has led to a great deal of similarity between portal sites, both in terms of visual impact and in terms of the services and content each offers⁶⁵.

⁶¹ Please refer to Appendix B.

⁶² Anonymous, 'Report: Internet Ad Revenues Nearly \$170 Million in 3rd Quarter', *Internet News*, <http://www.internetnews.com/IAR/1997/10/2101-report.html>.

⁶³ Beth Lipton, 'Excite upgrades search engine', *CNET News.com*, May 26, 1998, <http://www.news.com/News/Item/0,4,22442,00.html?st.cn.nws.rl.ne>; also: Beth Lipton, 'Lycos improves Tripod search', *CNET News.com*, May 27, 1998, <http://www.news.com/News/Item/0,4,22505,00.html?st.cn.nws.rl.ne>.

⁶⁴ Paul Festa, 'Netscape rolls out portal beta'. *CNET News.com*, June 16, 1998, <http://www.news.com/News/Item/0,4,23230,00.html>;

Janet Kornblum, 'Microsoft tests Start site', *CNET News.com*, June 16, 1998, <http://www.news.com/News/Item/0,4,19007,00.html?st.cn.nws.rl.ne>;

Jim Hu and Tim Clarke, 'Excite debuts auction service', *CNET News.com*, June 10, 1998, <http://www.news.com/News/Item/0,4,23007,00.html>.

⁶⁵ Maria Seminerio, 'New study says portals are all the same, to their detriment', *ZDNet News*, October 7, 1998, http://www.zdnet.com/zdnn/stories/zdnn_smgraph_display/0%2C4436%2C2146552%2C00.html.

Many of these changes have required the purchase of resources not previously commanded by the proto-portal, leading to a great number of deals, buy-outs and strategic partnerships being formed between various interested companies, including portal sites, content sites, ISPs, hardware manufacturers, software developers and so-called 'old media' companies like NBC and Disney.

Portals established from non-navigation site proto-portals, such as AOL and Microsoft, do not have competitive Internet search engines of their own and have either purchased or leased services from their competitors. Microsoft, for example, has developed its own search engine from scratch, using technology from the Inktomi search engine⁶⁶. The Microsoft Network (MSN) portal also provides access to other portal search engines from their search page: Altavista, Lycos, Infoseek and Snap. AOL's Net Find services, that allows its users to search the Internet, uses search technology licensed from Excite⁶⁷.

Proto-portals that did not have a strategic foothold in the ISP market, such as Yahoo, have been engaged in various deals with ISPs. Yahoo has been trying to get its ISP service, Yahoo Online, off the ground for some time. Towards this end, Yahoo and MCI were negotiating an agreement whereby Internet users who gained Internet access through MCI would be directed to the Yahoo portal. The deal fell through in September 1998 due to MCI's impending sale⁶⁸. AT&T's ISP service called WorldNet, which is much smaller than AOL, with only 1.1 million subscribers, has been involved in deals with a number of portals, including Excite, Lycos and Infoseek, and more recently with Yahoo after its MCI deal fell through⁶⁹.

Some of the fiercest competition has been for content sites because ultimately, it is the desire of users to access content that generates traffic. While navigation sites such as search engines benefit from this traffic, it is the content rather than the search engine that the user desires. The importance of content is highlighted by the list of services each portal keeps developing. For example, in June 1998 alone, Excite closed a deal to host Disney content and launched an auction service⁷⁰; Yahoo bought a Web content development company, ViaWeb, for an estimated \$49 million and launched a real estate service⁷¹; AOL bought Mirabilis, a company that makes the popular ICQ chat software⁷²; Infoseek added a home page creation service⁷³; and Altavista added content channels⁷⁴. Each of these acquisitions or developments are designed to increase the amount of content offered by each portal, and therefore to increase their traffic.

The important point to note here is that while portal sites have developed from proto-portals

⁶⁶ Jim Hu, 'MSN tests search engine', *CNET News.com*, September 8, 1998.
<http://www.news.com/News/Item/0,4,26114,00.html?st.cn.nws.rl.ne>.

⁶⁷ Various Authors, 'AOL, Excite search for deal', *CNET News.com*, November 25, 1996,
<http://www.news.com/News/Item/0,4,5695,00.html?st.ne.ni.rel>.

⁶⁸ Janet Kornblum, 'Yahoo, MCI deal goes bust', *CNET News.com*. September 14, 1998,
<http://www.news.com/News/Item/0,4,26344,00.html?st.cn.nws.rl.ne>.

⁶⁹ Jim Hu, 'AT&T adds Yahoo to portal roster', *CNet News.com*. September 23, 1998,
<http://www.news.com/News/Item/0%2C4%2C26740%2C00.html?sas.mail>.

⁷⁰ Reuters, 'Excite to host Disney content', *CNET News.com*. June 4, 1998,
<http://www.news.com/News/Item/0,4,22842,00.html?st.cn.nws.rl.ne>.

⁷¹ Randy Weston, 'Yahoo buys Viaweb for \$49 million', *CNET News.com*, June 8, 1998,
<http://www.news.com/News/Item/0,4,22893,00.html?st.cn.nws.rl.ne>.

⁷² Erich, Luening, 'AOL acquires instant message firm', *CNET News.com*, June 8, 1998,
<http://www.news.com/News/Item/0,4,22894,00.html?st.cn.nws.rl.ne>.

⁷³ Jim Hu, 'Infoseek adds home pages', *CNET News.com*, June 11, 1998,
<http://www.news.com/News/Item/0,4,23078,00.html?st.cn.nws.rl.ne>.

⁷⁴ Matthew Broersma, 'AltaVista looks to new heights', *ZDNet News*, December 30, 1997,
<http://www.zdnet.com/zdnn/content/zdnn/1229/266880.html>.

that successfully channelled users by one of the three outlined above, their functions have had to converge in order to compete with one another. Thus, the most successful portal sites are a combination of navigation site, content site and start page, a powerful combination that supplies a demand for access to content.

Main stakeholders

Through this substantial jostling for position among portal sites, a number of portals have emerged as leaders and begun to take large shares of the Internet audience. Since portal sites are primarily designed to generate advertising revenue, one measure of the success of a portal site is the number of users it attracts. RelevantKnowledge⁷⁵ is a company that tracks usage of the main Internet Web sites, and is regularly quoted in the Internet media, becoming a kind of *de facto* benchmark for portal site popularity. In September 1998, RelevantKnowledge identified the top twenty Internet Web sites, based on traffic for August 1998. The top ten sites based on RelevantKnowledge's findings, as published in *Inter@ctive Week* on September 14 1998, are summarised in Appendix B.

Of the top ten, four – Yahoo, Lycos, Excite and Infoseek – are based around search engines, emphasising the strategic value of search engines for attracting large number of users. However, the performance of sites that developed as start pages or simply as content sites without navigation functions highlights the fact that portal sites are not only based around search engines. Such sites are America Online, which has become one of the leading portals by channelling its ISP customers to its portal site by way of inserting its start page in its user's Internet starter packs. Similarly, Netscape and Microsoft have entered the portal market through the numbers of users channelled to their respective start pages through their browser software.

Disney is a particularly interesting company. Disney's main strength is its content and strong brand name identification, and thus constitutes a portal that developed from a content site rather than as a navigation or start page site. On the basis of its content alone, Disney made it into the top twenty most trafficked sites. In mid-June 1998, Disney bought shares in Infoseek, and has since been establishing a new portal based around Infoseek technology⁷⁶. There is some suggestion that Infoseek itself may be subsumed by the new Disney site, and from this a portal site will emerge, combining Infoseek's navigation strengths with Disney's content⁷⁷. This would be an interesting development, since one of the top ten portal sites would then be owned by one of the world's largest media companies.

Similarly, NBC's partnership with Microsoft in MSNBC, rated by RelevantKnowledge as the nineteenth most trafficked Web site in August 1998, combined with NBC's purchase of shares in CNET (rated sixteenth), represents the move by another 'old media' company into portal space⁷⁸.

The involvement of major technology and media companies in portal sites, and the investment of millions of dollars in venture capital raises the question of what these companies hope to achieve in the long term, and what, if any impact portal sites will have upon tomorrow's Internet. Furthermore, as portals continue to develop, there are likely to be a number of issues that their owners will have to face in order to maintain their position. These questions and problems are examined in the following, final chapter.

⁷⁵ RelevantKnowledge, Inc, *RelevantKnowledge*, <http://www.relevantknowledge.com/home.html>.

⁷⁶ Jeff Pelling, 'Disney takes stake in Infoseek', *CNET News.com*, June 18, 1998, <http://www.news.com/News/Item/0%2C4%2C23322%2C00.html?sas.mail>.

⁷⁷ Jim Hu and Dawn Kawamoto, 'Infoseek searches for direction', *CNET News.com*, September 25, 1998, <http://www.news.com/News/Item/0%2C4%2C26835%2C00.html?sas.mail>.

⁷⁸ Various Authors, 'NBC buys stake in CNET, Snap', *CNET News.com*, June 10, 1998, <http://www.news.com/News/Item/0%2C4%2C22959%2C00.html?sas.mail>.

Chapter 4

The future of portals

This final chapter focuses on the future of portal sites, and their effect upon the Internet. There are a number of challenges which portals must overcome if they are to develop further. These challenges concern competition from content sites, the continued ability of portal sites to meet users' resource location requirements, and the viability of the advertising model upon which portal sites rely. These are each considered in turn, below.

The chapter ends by identifying the transition of portal sites from points of resource discovery which direct users to content, to the emerging role of portal sites as user destinations – sites that actually provide large numbers of users with the content rather than simply directing them to it. As huge numbers of users are directly channelled to a portal by way of browser or ISP, they find all their Internet content requirements supplied by one site, which places that site in a powerful central position to potentially make a profit from all transactions that take place within that site.

In this light, portals constitute what has been described as transactional space⁷⁹ –constructed spaces which will ultimately lead to more centralised control of the medium. One practical application of this theory can be seen in The Gartner Group's prediction that five portal sites will emerge as leaders and dominate the Internet, in much the same way that a smaller number of television channels dominate broadcast television.

Present and future portal issues

A number of issues are likely to arise as challenges to portal sites. These issues will have a bearing on the future development and issues which will impact upon portal sites, and, if portal sites continue to hold a central place in most people's Internet experience, it follows that the issues will have a large impact on people's online experience.

The portal/content dynamic

There will continue to be a dynamic relationship between content providers and portal sites. While portal sites are increasingly incorporating content into their sites, some content sites will always stand alone, making deals with the portal sites to direct traffic to them. The question here is just how this relationship between portal sites and content will pan out. Portal sites need content to attract users, while content sites will increasingly come to rely upon portals to direct traffic to them. Would a content site pay the portal in return for traffic passed to it (click-through traffic) or would the portal pay a subscription fee to the content site for linking through to its information?

For example, GeoCities attracts a large audience, precisely because it provides a great deal of content. By giving Internet users free Web publishing space, anyone with an Internet connection can have their own home page. The more people who set up a home page, the more content GeoCities provides and thus the more traffic it attracts. Since GeoCities attracts such a huge audience in its own right (14 million unique visitors in 1998)⁸⁰, it can either charge portals for advertising on its home page, or it can advertise within a portal to attract even more users.

Just how this relationship will emerge is open to discussion. If portal sites command the attention of a closed environment of users, as examined below, then content sites like GeoCities will begin to lose traffic unless they enter into a strategic relationship with a portal site. If, however, users regularly stray from portal sites, then it may be the portal sites which depend on popular content sites to direct traffic to them.

⁷⁹ P. White, 'Online Services and 'transactional space': emerging strategies for power and control in the new media', *Telecommunications Policy*, vol. 21, no. 6, p. 566.

⁸⁰ See chapter three.

Resource discovery in portal space

Another issue that will continue to grow in complexity is resource discovery. As portals become more complex, resources will be more difficult to find within the portal site. Better indexing of content will require new strategies, such as the use of metadata.

Metadata is “data about data”⁸¹, extra information about a Web page contained either within that Web page or contained within a database. Metadata aims to make resource discovery more effective by adding contextual information (such as author name, subject, title, and so on) to the document, thus freeing the user from the context-insensitivity of conventional search engines.

Increasingly, it is likely that portals will need to generate and maintain metadata for their content so that users can continue to access content in a timely and efficient manner. If they cannot achieve this, many of the benefits of the portal site will be gone for the user, and the portal site will thus not be able to compete with better organised portals in which content is easier to find.

The tagging of portal content with metadata also opens the possibility of establishing ratings systems within portals through strategies such as Platform for Internet Content Selection (PICS). PICS is a form of metadata that acts as a framework upon which a ratings system can be implemented. While PICS has achieved a degree of notoriety because of its application in censoring information, it can equally be used as an aid in resource discovery. For example, PICS provides a technical solution for implementing a rating system based on an assessment of the academic merit of a Web page.

Another solution to growth in Web site complexity is that portal sites will begin to form ‘hubs’⁸². A hub is a portal site with a theme (cricket, or science fiction, for instance) or a gimmick designed to provide its users with access to all the information about a particular subject or product, rather than with general access to the Internet as a whole. Large portal sites like Yahoo could thus oversee a number of different hubs, which would be advantageous for a number of reasons. One major advantage is that it would allow the portal owner to endorse competing advertisers (Amazon and Barnes and Noble, for example) in different hubs. Another major benefit is that by presenting different services and content packaged as separate services, portal owners can appeal to a wider demographic. AOL has adopted this strategy by maintaining its CompuServe and AOL businesses as separate (and competing) undertakings⁸³.

Advertising in portal space

Advertising in portal space is yet another interesting issue, because it brings up questions about how successful current Internet advertising strategies are, and whether the revenue they generate is sustainable. In an interactive marketplace, product manufacturers can talk with and sell directly to their customers, a marketing strategy which has piqued the interest of a number of companies. How does this approach fit with the portal strategy? Similarly, it is widely assumed that one of the greatest benefits of the Internet to marketers is the ability to garner information about users, which can be used to build a profile for more successfully targeted advertising schemes. What role will portals play in making this work, and what issues does this raise concerning privacy?

The most basic type of advertisement, the banner ad, simply displays a graphic in the user’s browser, inviting them to click the image to see more information or connect to the advertiser’s Web site. This simple approach to advertising is like television advertising in that it is indiscriminate. Because the success of advertising can be more readily evaluated on the

⁸¹ Paul Miller, ‘Metadata for the masses’, *Ariadne*, Issue 5 (September 1996).
<http://www.ukoln.ac.uk/ariadne/issue5/metadata-masses/>.

⁸² Scot Petersen, ‘Lycos CEO: Goodbye portals, hello hubs’, *PC Week Online*, July 17, 1998,
<http://www.zdnet.com/pcweek/news/0713/17elycos.html>.

⁸³ Jim Hu, ‘Portals offer alternative gateways’, *CNET News.com*, August 27, 1998,
<http://www.news.com/News/Item/0%2C4%2C25783%2C00.html?sas.mail>.

Internet (when a user clicks an advertisement, the click is recorded, and the advertiser can thus get statistics about how many users are connecting to their site), portal sites have needed to target advertisements to increase their effectiveness⁸⁴.

There are two methods portal sites use to achieve this: first, as users enter search terms into search engines, the portal site can display banner ads which a computer algorithm calculates is relevant to the thing being searched for. For example, entering the search term "flowers" might display an advertisement for a florist. The second, and more powerful way of targeting advertisements is to take advantage of the market segmentation effected by content. It is reasonable to assume that people viewing content about cars are interested in cars, and therefore, advertising can be targeted accordingly.

Construction of content areas designed to segment the audience and thus enhance the efficacy of advertising are thus likely, and indeed, are already beginning to show. Yahoo's home page provides links to computer and real-estate classifieds, for example⁸⁵. A real-estate agency which advertises within the Yahoo real-estate classifieds is obviously more likely to attract buying customers than if they were to advertise on a page designed for teenagers.

Another method for obtaining information about the user's interests and habits and thus to target advertising more effectively, is to monitor their choices whenever they need to make them, or more effectively, to create reasons that users would need to make such choices. By providing options to personalise the portal home page, for example, the user can select the types of links they want displayed most prominently when they access the Web site. By making these selections, the portal site is able to collect information about the user's preferences and target advertising accordingly. In this approach, it is necessary for the user to identify themselves, usually by becoming a 'registered' user of a service such as Yahoo. These registered users have been described as "a gold mine for companies trying to become a "portal" to the Web"⁸⁶.

One final point worth noting with respect to portals and advertising concerns the viability of the Internet advertising model. Sites which base their revenue upon the insertion of banner ads on Web pages may find that as new models of marketing develop, their revenue base shrinks and becomes too small to support their operation. One study from Forrester Research suggested that in a sample of fifty major advertisers, most consider Internet advertising to be highly ineffective⁸⁷.

Recently, a number of articles and reports have appeared which suggest that Internet advertising in its current form may be based on an unsound model. It is argued that the Internet represents a new medium in which "the focus has shifted from customer acquisition to relationship marketing and developing customer loyalty"⁸⁸ – in other words, new models of selling on the Internet is based around the ability of the producer to market directly to their consumers, rather than through an 'advertising middleman'. The uncertainty surrounding the viability of the banner advertising model suggests that portals will need to develop more effective ways of marketing products to customers to maintain their revenue base.

⁸⁴ Tim Clark, 'Targeting urged for Net ads', *CNET News.com*, August 12, 1998, <http://www.news.com/News/Item/0%2C4%2C25218%2C00.html?sas.mail>.

⁸⁵ See Yahoo's start page: <http://www.yahoo.com/>.

⁸⁶ Suzanne Galante, 'Yahoo up, Net stocks follow', *CNET News.com*, April 9, 1998, <http://www.news.com/News/Item/0%2C4%2C20938%2C00.html?sas.mail>.

⁸⁷ CyberAtlas, *Internet Branding with Banners...How Reliable is it?*, http://www.cyberatlas.com/segments/advertising/internet_branding.html.

⁸⁸ Paul Festa, 'Ad-driven Net firms in danger', *CNET News.com*, July 13, 1998, <http://www.news.com/News/Item/0%2C4%2C24119%2C00.html?sas.mail>.

Portals as Internet Content 'Channels'

Portals as content providers

As described in chapter three, portals aim to maximise their audience by channelling them to the portal site by way of the browser, and by providing them with access to Internet content. Competition for users has led portal sites to providing their own user-attracting content, including news and current affairs, weather forecasts, online games, virtual communities and chat services, personal home pages, online classified advertising, personals, stock and investment utilities, search engines, hierarchical indexes of links, and the list goes on.

This provision of content and navigation together, presented to the user as a kind of information nexus, marks an important developmental milestone for the commercial Internet. Portals have become destinations in and of themselves. Where before search engines attracted large numbers of transient users who were on their way somewhere else, portal sites attract and aim to hold their users, and in so doing, have created a metaphorical resort in cyberspace.

In the real world, resorts in exotic countries offer tourists a controlled, safe environment in which to swim, sunbathe, play games with friends, socialise, purchase trinkets or groceries, and experience, in complete safety, only as much of the local culture as they can stand without feeling too threatened. Portal sites, with their tailored content, moderated chat fora, online games and personalisation options are like the cyberspace equivalents of resorts. The user can go online, buy books and music CDs, read the news, chat, send and receive email without ever needing to leave the portal site.

Transactional space

Constructed spaces like portal sites have been described as 'transactional space', and hold important ramifications for the future of power and control on the Internet. It has been suggested that the Internet, with its decentralised architecture and associated resistance to centralised control offers a truly democratic medium that by its very design resists attempts by power elites to control it. Put simply, gaining control over the Internet is not just a matter of buying out the governing body of the Internet, since there is no governing body to purchase.

Portal sites, however, appear to have succeeded in capturing large audiences of repeat Internet users, and in providing these users with controlled content. Through the construction of a controlled space, populated with carefully selected Internet content, and the channelling of many users into that space, content and users become centralised, and thus so does control.

By drawing upon concepts of space as a metaphor for understanding the power dynamics of emerging new media systems, White has developed a framework which can help identify the mechanisms at work. White has identified the importance of 'transactional spaces' as sites in which "new forms of strategic power and control are emerging"⁸⁹. White compares the notion of transactional space with the notion of 'channel space', the locus of control in broadcast media created by the limited number of broadcast channels.

White identifies the browser as an example of a software-created transactional space, because "it places Microsoft software at a pivotal point in the transactions which a computer user makes with the resources on the Internet"⁹⁰. Likewise, the portal site has evolved to become an even more potent transactional space, because, like the browser, the portal site mediates the user's interaction and transactions with Internet resources, including other Internet users. It is not difficult to see that this places the portal site in a strong strategic position.

The channel model

The strategic importance of portal sites are their strongest and most valuable asset. The

⁸⁹ P. White, 'Online Services and 'transactional space'', p. 566.

⁹⁰ *ibid.*, p. 572.

possibility alone that portal sites may become like the television channels of a vast worldwide digital medium has ignited furious interest in portals, substantially raising share prices for companies like Yahoo⁹¹. Investment in portals by companies such as NBC and Disney, as indicated in the previous chapter, heralds serious involvement by powerful multi-national media organisations.

The possibilities that portal sites hold for strategic position and possible control over Internet transactions has led the Gartner Group to suggest that by the year 2000, a few leading portals may eventually attract and hold the majority of Internet users⁹². They predict that content sites hungry for users will then rely upon portal sites to channel users to them, while users will increasingly rely upon portals to provide them with access to information.

In addition to this, a great deal of content has not been successful outside portal space may become more likely to succeed in the controlled environments established by portals. One key example is electronic commerce. According to a recent survey of Australian Internet users carried out by [www.consult](http://www.consult.com.au), 22 per cent of respondents stated concerns with security as being one of the main reasons they did not engage in more online commerce⁹³. Portal sites, however, aim to create safe communities which may build commercial and user confidence. Sites outside established portals will be perceived as presenting a greater risk to the consumer, and thus it will become important for those sites to exist within a portal-based store, such as Yahoo's "Yahoo! Store"⁹⁴.

Against the channel model

While predictions that today's portal sites will become tomorrow's media giants are compelling, it is by no means a given that this is the only way the Internet can develop. Jupiter Communications has argued against the Gartner Group's analysis, suggesting that much of the success of portals to date is the result of an inexperienced Internet user base. According to Jupiter, as Internet users become more experienced, they would soon tire of the controlled environments of portal space and go in search of more interesting content outside portal space, perhaps in the unruly domain of the public Internet: "As users become more savvy, they ultimately have less of a need of a meta-aggregator of content and may choose a really specific niche along their own demographic or content"⁹⁵. Users will become less reliant upon portals for resource location and will use other means of accessing Internet content (such as using personal bookmarks to convey them directly to content they enjoy).

In conjunction with Jupiter Communications' argument, content sites may themselves constitute the biggest challenge to the Gartner Group's predictions. Popular content sites like news services already attract a large audience and are adding extra portal-like functions to their Web sites. This presents an interesting challenge for portal sites. If a few content sites become very popular, they will compete directly with portal sites for traffic. Indeed, if users spend most of their time within one content provider's site, and the content provider supplies access to basic services like free e-mail, then the user may have no need for the portal sites.

At this stage, it is impossible to tell how users will react. As explained in chapter three, because of the rapid increase in Internet users, most users are inexperienced, and so their behaviour may well change over time, thus rendering predictions based on today's statistics incorrect. Similarly, statistics based on usage patterns of experienced users does not enlighten us to how today's inexperienced users will develop, as the statistics must draw from a sample of users who are increasingly unrepresentative of the average Internet user. The

⁹¹ See, for example Suzanne Galante, "Yahoo up, Net stocks follow".

⁹² Jim Hu, 'Portals as Net's TV stations', *CNET News.com*, July 21, 1998, <http://www.news.com/News/Item/0%2C4%2C24445%2C00.html?sas.mail>.

⁹³ WWW.Consult, *5th Wwww.Consult Australian Online Survey Completed*, <http://www.consultco.com.au/pr/online5.html>.

⁹⁴ Yahoo Inc., *Yahoo! Store: Create your own secure online store*, <http://store.yahoo.com/>.

⁹⁵ Jim Hu, 'Racing to the start line', *CNET News.com*, May 14, 1998, <http://www.news.com/SpecialFeatures/0,5,22073,00.html?st.ne.ni.rel>.

average Internet user who started using the 'Net in 1994 is demographically different to the average Internet user who started using the 'Net in 1997.

Two possibilities exist: a certain number of users will go beyond the portals and controlled content for their general browsing, and will only use the portals as stepping stones to content, the majority of which will lie outside the portal space; and, other users will find all they need within the portal space, and without any significant need to leave the portal, will spend most of their time within it, perhaps straying into the rest of the 'Net only if someone points them to a particular resource. The question that cannot be answered is into which of these two categories will the majority of users fall.

If the portal continues to maintain its place as the user's primary point of access to Internet content and services, then this ability to gather user information places the portal site owner in a potentially very powerful position, with detailed information about the buying and viewing habits of millions of users. Obviously, this introduces a number of issues concerning privacy and rights to use personal information, which are far too complex to deal with adequately here. If portal sites continue to be central to people use of the Internet, then privacy will become a major issue for portal sites, and for the Internet users who use them.

Chapter 5

Conclusions

The significance of portal sites to the development of the Internet can easily be overlooked when viewed in isolation. At face value, the high valuation of shares in portal site companies and the multi-million dollar site buy-outs is reminiscent of the hyperbole that accompanied server-push technology in 1997. However, when viewed in the context of the development of the Internet, portal sites are revealed as far a more significant development.

As chapters one and two outlined, since the commercialisation of the Internet, there has been a gradual change in the profile and demographic of the average Internet user. This change has contributed largely to the development and popularity of portal sites, and goes to the heart of questions about how the Internet will be used in the future, and what forms control over the medium may take.

By establishing centralised points of access – the construction of transactional spaces to mediate users' interaction with the medium – portal sites effectively re-establish the structures of power and control that early proponents of the Internet hoped would be rendered useless and archaic in the distributed, anarchic medium of the Internet.

It is still too early to make predictions about the possible long term effects of portal sites on the Internet – it is not even certain that portal sites (or their descendants) will be able to meet challenges such as the viability of the advertising model or the possibly fickle usage habits of tomorrow's more experienced Internet user. However, when viewed in context with the history of the Internet and its ongoing commercialisation, one thing is clear: portal sites are part of a much larger game for control of the Internet that has only just begun.

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Appendix A – A declaration of the independence of cyberspace

The following e-mail from John Perry Barlow "A Declaration of the Independence of Cyberspace", is taken from the Electronic Frontiers Foundation archives. The URL for this document is:

http://www.eff.org/pub/Publications/John_Perry_Barlow/barlow_0296.declaration.txt

Date: Fri, 9 Feb 1996 17:16:35 +0100
To: barlow@eff.org
From: John Perry Barlow <barlow@eff.org>
Subject: A Cyberspace Independence Declaration

Yesterday, that great invertebrate in the White House signed into the law the Telecom "Reform" Act of 1996, while Tipper Gore took digital photographs of the proceedings to be included in a book called "24 Hours in Cyberspace."

I had also been asked to participate in the creation of this book by writing something appropriate to the moment. Given the atrocity that this legislation would seek to inflict on the Net, I decided it was as good a time as any to dump some tea in the virtual harbor.

After all, the Telecom "Reform" Act, passed in the Senate with only 5 dissenting votes, makes it unlawful, and punishable by a \$250,000 to say "shit" online. Or, for that matter, to say any of the other 7 dirty words prohibited in broadcast media. Or to discuss abortion openly. Or to talk about any bodily function in any but the most clinical terms.

It attempts to place more restrictive constraints on the conversation in Cyberspace than presently exist in the Senate cafeteria, where I have dined and heard colorful indecencies spoken by United States senators on every occasion I did.

This bill was enacted upon us by people who haven't the slightest idea who we are or where our conversation is being conducted. It is, as my good friend and Wired Editor Louis Rossetto put it, as though "the illiterate could tell you what to read."

Well, fuck them.

Or, more to the point, let us now take our leave of them. They have declared war on Cyberspace. Let us show them how cunning, baffling, and powerful we can be in our own defense.

I have written something (with characteristic grandiosity) that I hope will become one of many means to this end. If you find it useful, I hope you will pass it on as widely as possible. You can leave my name off it if you like, because I don't care about the credit. I really don't.

But I do hope this cry will echo across Cyberspace, changing and growing and self-replicating, until it becomes a great shout equal to the idiocy they have just inflicted upon us.

I give you...

A Declaration of the Independence of Cyberspace

Governments of the Industrial World, you weary giants of flesh and steel, I come from Cyberspace, the new home of Mind. 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.

We have no elected government, nor are we likely to have one, so I address you with no greater authority than that with which liberty itself always speaks. I declare the global social space we are building to be naturally independent of the tyrannies you seek to impose on us. You have no moral right to rule us nor do you possess any methods of enforcement we have true reason to fear.

Governments derive their just powers from the consent of the governed. You have neither solicited nor received ours. We did not invite you. You do not know us, nor do you know our world. Cyberspace does not lie within your borders. Do not think that you can build it, as though it were a public construction project. You cannot. It is an act of nature and it grows itself through our collective actions.

You have not engaged in our great and gathering conversation, nor did you create the wealth of our marketplaces. You do not know our culture, our ethics, or the unwritten codes that already provide our society more order than could be obtained by any of your impositions.

You claim there are problems among us that you need to solve. You use this claim as an excuse to invade our precincts. Many of these problems don't exist. Where there are real conflicts, where there are wrongs, we will identify them and address them by our means. We are forming our own Social Contract . This governance will arise according to the conditions of our world, not yours. Our world is different.

Cyberspace consists of transactions, relationships, and thought itself, arrayed like a standing wave in the web of our communications. Ours is a world that is both everywhere and nowhere, but it is not where bodies live.

We are creating a world that all may enter without privilege or prejudice accorded by race, economic power, military force, or station of birth.

We are creating a world where anyone, anywhere may express his or her beliefs, no matter how singular, without fear of being coerced into silence or conformity.

Your legal concepts of property, expression, identity, movement, and context do not apply to us. They are based on matter, There is no matter here.

Our identities have no bodies, so, unlike you, we cannot obtain order by physical coercion. We believe that from ethics, enlightened self-interest, and the commonweal, our governance will emerge . Our identities may be distributed across many of your jurisdictions. The only law that all our constituent cultures would generally recognize is the Golden Rule. We hope we will be able to build our particular solutions on that basis. But we cannot accept the solutions you are attempting to impose.

In the United States, you have today created a law, the Telecommunications Reform Act, which repudiates your own Constitution and insults the dreams of Jefferson, Washington, Mill, Madison, DeToqueville, and Brandeis. These

dreams must now be born anew in us.

You are terrified of your own children, since they are natives in a world where you will always be immigrants. Because you fear them, you entrust your bureaucracies with the parental responsibilities you are too cowardly to confront yourselves. In our world, all the sentiments and expressions of humanity, from the debasing to the angelic, are parts of a seamless whole, the global conversation of bits. We cannot separate the air that chokes from the air upon which wings beat.

In China, Germany, France, Russia, Singapore, Italy and the United States, you are trying to ward off the virus of liberty by erecting guard posts at the frontiers of Cyberspace. These may keep out the contagion for a small time, but they will not work in a world that will soon be blanketed in bit-bearing media.

Your increasingly obsolete information industries would perpetuate themselves by proposing laws, in America and elsewhere, that claim to own speech itself throughout the world. These laws would declare ideas to be another industrial product, no more noble than pig iron. In our world, whatever the human mind may create can be reproduced and distributed infinitely at no cost. The global conveyance of thought no longer requires your factories to accomplish.

These increasingly hostile and colonial measures place us in the same position as those previous lovers of freedom and self-determination who had to reject the authorities of distant, uninformed powers. We must declare our virtual selves immune to your sovereignty, even as we continue to consent to your rule over our bodies. We will spread ourselves across the Planet so that no one can arrest our thoughts.

We will create a civilization of the Mind in Cyberspace. May it be more humane and fair than the world your governments have made before.

Davos, Switzerland
February 8, 1996

John Perry Barlow, Cognitive Dissident
Co-Founder, Electronic Frontier Foundation

Home(stead) Page: <http://www.eff.org/~barlow>

Message Service: 800/634-3542

Barlow in Meatspace Today (until Feb 12): Cannes, France
Hotel Martinez: (33) 92 98 73 00, Fax: (33) 93 39 67 82

Coming soon to: Amsterdam 2/13-14, Winston-Salem 2/15, San Francisco 2/16-20, San Jose 2/21, San Francisco 2/21-23, Pinedale, Wyoming

In Memoriam, Dr. Cynthia Horner and Jerry Garcia

It is error alone which needs the support of government. Truth can

stand by itself.

--Thomas Jefferson, Notes on Virginia

Appendix B – Top 20 Web sites (August 1998)

The data in the following table is taken from an article appearing in Inter@ctive Week on September 14, 1998, quoting statistics generated by RelevantKnowledge. The online article can be found at: <http://www.zdnet.com/intweek/print/980914/351194.html>

| Rank | Site | Unique Visitors (000s) |
|------|-----------------|------------------------|
| 1 | Yahoo!/Four11 | 26,624 |
| 2 | AOL.com* | 22,033 |
| 3 | Microsoft | 18,586 |
| 4 | Lycos Network** | 17,625 |
| 5 | Excite | 17,343 |
| 6 | Netscape | 16,306 |
| 7 | MSN/Hotmail | 14,578 |
| 8 | GeoCities | 14,239 |
| 9 | Infoseek | 12,154 |
| 10 | Walt Disney | 9,655 |
| 11 | AltaVista | 8,878 |
| 12 | RealNetworks | 8,812 |
| 13 | CNet | 6,816 |
| 14 | ZDNet | 6,224 |
| 15 | Xoom | 5,939 |
| 16 | CNN | 5,792 |
| 17 | Switchboard | 5,489 |
| 18 | Amazon.com | 5,429 |
| 19 | MSNBC | 5,184 |
| 20 | Weather Channel | 4,724 |

Rankings based on aggregation of multiple URLs. All numbers are estimates and subject to the limitation inherent to survey methodology.

* The RelevantKnowledge report under-represents traffic to AOL's AOL.com.

** Lycos Network includes the WhoWhere? and Angelfire properties.

Appendix C – Snapshot of the Yahoo portal

This appendix is included to provide readers who are unfamiliar with portal sites with an example of a typical portal site. All portal sites rely heavily upon a start page to establish brand identification, and because Yahoo is often noted as establishing its brand very well, the Yahoo portal will be examined here. The Yahoo start page is shown on the following page.



Figure 3 – The Yahoo Start Page (as seen in October, 1998)

The complexity of this page is perhaps the first thing that strikes the viewer. The features on

the page can be broken into main features which are common to many portals. Along the top of the page are four buttons (What's new, check email, personalize and help), and the Yahoo brand name.

Directly under this is a rectangular region containing advertisements - a text advertisement for the Yahoo games area, a graphic for a piece of software developed by Yahoo, and another text advertisement for phone rates. Directly under this is a white rectangle with a button next to it marked 'Search'. This is the Yahoo search engine (the options link allows the user to specify more complex searches). Following the search engine is another advertisement, followed by a number of links to popular Yahoo content areas.

Directly beneath this list of links is a large rectangular region which dominates the page. This area is the Yahoo index, a hierarchical list of links to Internet resources (mostly not part of Yahoo), grouped by category. By clicking on a category, a new page loads and displays a list of items under that subject heading. For example, if you're interested in finding web sites about how to become a vet, you might select 'education' or 'science'.

To the right of these categories are a selection of News headlines and a number of selected Yahoo content. Yahoo clubs, for example, is Yahoo's virtual community forum in which users can chat to other users; Yahoo games is a forum where users can play online games.

Towards the bottom of the page is a series of links to versions of Yahoo available in different countries. These country-specific Yahoos are substantially like the one pictured above, but provide slightly more targeted content. For example, the Australian Yahoo provides headlines to Australian news stories.

The Other Guides lets users access yet more Yahoo content: *autos* is an online car classified; *computers* is an online computer classified, *movies* contains movie review, and so on. Finally, at the bottom of the page are a number of links designed mainly to provide access to company information, a way to add sites to the Yahoo index, an outline of the Yahoo privacy policy, and so on.

Many parts of the Yahoo page are common to all portals: the *personalize* function, for example, allows the user to customise the Yahoo start page. When they return to the start page, they can log in and get only the information they have nominated. This is an important aspect to all the major portal sites, because if the user customises their page, they are more likely to return, and the portal site can build a profile of the user and target advertising accordingly.

Real-estate listings and classifieds (autos, computers), stock prices, TV guides, customisable calendars, email, personals, chat groups, virtual communities: all these services are common to all the major portal sites.

Appendix D – List of abbreviations

ABS – Australian Bureau of Statistics
ANS – Advanced Network Services
AOL – America Online
ARPA – Advanced Research Projects Agency
AUP – Acceptable Use Policy
BBS – Bulletin Board System
CIX – Commercial Internet Exchange
CORE – (ANS CORE) Commercial Research and Education
DARPA – Defence and Advanced Research Projects Agency (USA)
EFF – Electronic Frontiers Foundation
FAQ – Frequently Asked Question
FTP – File Transfer Protocol
GVU – Graphics, Visualisation and Usability (Centre, Georgia Institute of Technology)
HTML – Hypertext Markup Language
IETF – Internet Engineering Taskforce
ISOC – Internet Society
ISP – Internet Service Provider
MERIT – Michigan Educational Research Information Triad
MSN – Microsoft Network
MSNBC – Microsoft/NBC
NREN – National Research and Education Network (USA)
NSF – National Science Foundation (USA)
PDI – Public Data Internet
PICS – Platform for Internet Content Selection
RFC – Request for Comment
SRI – Stanford Research Institute
WELL – Whole Earth 'Lectronic Link
WWW – World Wide Web

