CONNECTED IS A MATTER OF GEOGRAPHY

By Matthew Zook
zook@zooknic.com

In June 2001, the founder of the Wild Day Internet shopping site, Michael Jackson, announced his intention to run his company remotely as he climbs K2, the second highest mountain in the world. Although largely a public relations event, it is the most recent example of a widely held assumption that the Internet is creating a world in which it is possible to "be connected" even in the most remote locations. Yet, "connected" is a tricky word. Are we truly entering a time in which technology renders geography meaningless? Will large numbers of people permanently move to Tahiti or Hawaii and conduct business there? Although the idea is certainly attractive to large segments of the population it is unclear to what extent the actual geography of the Internet supports this idea. For example, much of the growth of the Internet has concentrated in a relatively small number of countries and urban areas, with ten cities accounting for only 1.5 percent of the world's population but close to 25 percent of its domain names. At the same these top cities contain within them pockets which for reasons of poverty or education remain largely disconnected from this global network.

City	Domains (gTLD & ccTLD) Jan 2001
New York	1,575,500
Los Angeles	1,463,900
London, UK	1,182,928
San Francisco	1,010,550
Washington DC	642,250
Seoul, Korea	560,796
Chicago	475,800
Boston	457,600
Miami	340,500
Dallas	318,750

Thus, despite the promise of ubiquitous connectivity, the Internet is a more selective network that parallels physical geography and economic development. Although it is possible to connect to the Internet from the side of a mountain, one has to wonder who will be doing it, what kind of interaction it will be, and at what cost. Is it more likely to be a student from the local Sherpa village or tourists checking their email and latest baseball scores? Although many people conceive of interacting in a "placeless cyberspace", the reality of the Internet is that it cannot exist without the people who create and consume its content and the computers, wires and, as we in California are increasingly aware, the electricity that run it and the money that pays for it. In short, the Internet is not destroying geography but selectively connecting certain people and places into highly interactive networks, while at the same time largely bypassing others.

The central hub of the Internet has been and will remain for some time the United States. Figure 1 shows the rate of dispersion from the United States for five separate measures of the Internet.

Because the United States was the original location of the Internet, this dispersal rate is a good indicator of how quickly the Internet is spreading over time. A useful distinction to keep in mind while looking at this data is whether the variable represents "using the Internet", *i.e.,* emailing, surfing, searching, or "making content for the Internet", i.e., creating a website or other content. This rudimentary supply and demand relationship provides some useful insights on exactly how the Internet is spreading to the world.

The variable with the fastest rate of decline and generally the most dispersed, is Internet users. From 69 percent in January 1997, the US's share has dropped almost in half to approximately 37 percent. This rate of adoption of the use of the Internet confirms what can be found in any guidebook listing. In almost any country or city in the world, it is possible to find an Internet café in which you can check email and surf your favorite web sites. Of course, the speed, reliability and cost of the connection varies a great deal but nonetheless, this demonstrates increasingly widespread access to the Internet. Paralleling this variable is the dispersion of Internet hosts, i.e., computers connected to the Internet, which tells much the same story about the spread of Internet use. This dispersion, however, only tracks the most basic measure of the Internet, simple connectivity or demand for the Internet.

An indicator that gives a more nuance understanding of how people are using the Internet, at least the extent to which they are engaging in e-commerce, is the dispersion of secure socket layer software (SSL). The SSL protocol allows for the encryption of transmissions across open TCP/IP networks and is often used to protect credit card transactions. The continued concentration of this indicator within the United States shows that while Internet access has spread, the diffusion of more sophisticated uses of it such as commerce is taking place at a slower rate.

Figure 1
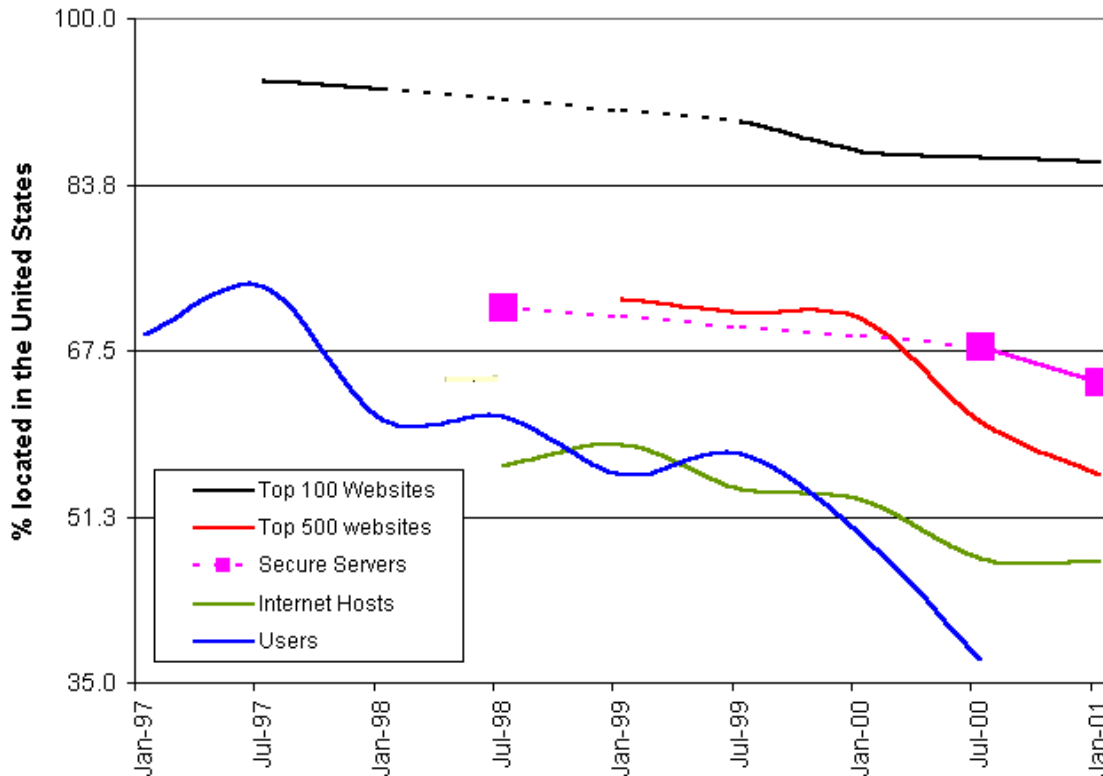
Notes and Source: Dashed lines indicate no data for that time period; Internet Users - Nua How Many On-line; Top 100 websites – Go2Net Rankings, location based on domain name registration; Top 500 websites – Alexa Research, location based on domain name registration; Internet Hosts – Network Wizards, All edu/gov/mil/us hosts and a percentage of com/net/org hosts based on the US's share of these gTLDs were considered to be in the US ; Secure Servers – Netcraft cited by OECD and available on Netcraft's website

Looking at the opposite side of the relationship, it is clear that the distribution of the supply of Internet content or services is significantly more concentrated than use. The majority of the 100 and 500 most visited websites in terms of hits continue to be located in the United States. Although this concentration has declined over time, the levels are consistently higher than for users or hosts. Moreover, in the case of the top 100 sites, the rate of decline is very small. This implies that while users are connecting from more places, the first mover advantage enjoyed by the top websites is drawing these users to fixed set of businesses that remains much more concentrated in the United States.

Figure 1's narrow focus on the United States masks the pattern of adoption of the Internet in other countries. In order to understand this pattern better, Table 1 lists the twenty countries with the greatest concentrations of domains names, both com/net/org and country codes domains). Based on my ongoing research project, registration addresses for domain names provide a useful measure for the location of the production of Internet content and websites. Although registering domain names is relatively easy, it nevertheless represents a decision to make some kind of

information, commercial or otherwise more easily available to people on the Internet. In that sense, domain names are indicative of the supply of Internet content within a country.

As Table 1 illustrates, the United States is the most concentrated location of domain names worldwide. For most of this period it had one of the highest number of domains per capita of any of the top twenty countries. In January 2001, only the United Kingdom and Denmark reported higher levels. Another significant observation from this table is that it contains countries from every inhabited continent in the world with the exception of Africa. At number twenty-five, South Africa is the highest ranking African country and the next sub-Saharan African country is Nigeria at number 100. This low level of domain registrations which is echoed by the available data on Internet users, shows that the African continent is largely switched off from the global network.

Table 1

	July 1998		**January 2001**	
	% of World	*Per capita*	*% of World*	*Per capita*
United States	49.2	6.08	42.3	52.68
United Kingdom	7.0	3.93	12.4	69.76
Germany	7.6	3.05	10.3	41.70
Canada	4.9	5.32	3.5	38.06
South Korea	0.8	0.57	3.3	24.06
Netherlands	1.9	4.07	2.4	51.24
Italy	1.8	1.01	2.1	12.08
France	2.0	1.11	2.0	11.60
Japan	1.9	0.48	1.8	4.65
Brazil	2.1	0.43	1.3	2.71
Australia	1.0	1.78	1.3	23.78
Argentina	0.2	0.17	1.1	10.78
China	0.7	0.02	1.1	0.30
Spain	1.0	0.80	1.1	8.93
Denmark	2.0	12.30	0.9	55.97
India	0.3	0.01	0.9	0.31
Switzerland	2.2	10.00	0.7	35.03
Austria	0.7	2.98	0.7	28.01
Sweden	1.9	7.02	0.6	23.90
Hong Kong	0.6	3.35	0.6	29.87

Source: com/net/org and country code domains– Author's research; per capita figures are based on 1996 population figures from the World Bank

Even the countries that have a presence on the Internet have experienced uneven rates of growth. Some countries, such as the United Kingdom and Germany, despite already large concentrations of domain names in July 1998, expanded their share and grew faster than the average rate across the world. Other countries like France, Austria and Italy have had much more modest and flat

growth rates while a number of smaller European countries such as Sweden, Switzerland, and Denmark have seen their relative share of the world's domains decline significantly. This decline is largely due to the fact that these countries already enjoyed significantly higher levels of domains per capita than other countries in July 1998 making potential expansion more difficult.

The countries with the largest expansions relative to their starting point in July 1998, are located around the globe. Argentina, in particular, experienced enormous growth during these two and half years, largely catching up with Brazil in absolute terms of domain names and surpassing it in per capita figures. Likewise, South Korea had an enormous expansion in the registration of Internet domains. From having less than half the number of domains as Japan did in July 1998, South Korea has more than twice the amount of its neighbor and has a considerably higher per capita rate.

The two most interesting countries, both in terms of absolute growth but also in their potential for future expansion, are India and China. During this two and half year period, both countries expanded their domain name holdings tremendously. What makes them particularly unique, however, is the low level of per capita rates hovering around one domain per 3,300 people or 200 times lower than the level enjoyed in the most domain rich countries. While these per capita rates provide the potential for growth these countries face considerable challenges in connecting much their rural and poor populations in these countries.

The highly varied geography of the Internet shown by this review, argues against simplistic ideas about how the Internet will change the way that we live our lives. Although the Internet can enable the dispersion of activities, it is too simplistic to think that it can only have this one effect. Both difussion and consolidation can happen at the same time although what is dispersed can be quite different from what is concentrated. The impact of the Internet, like any other technology, is based on how people use it and who can access it. Thus, connections to the Internet are highly specific so that certain people are able to be "hooked in" no matter where they are, e.g., on the side of a mountain, while others despite being in the heart of a "wired" region such the San Francisco Bay, will for reasons of poverty, age or education status not be connected.