

Inequality and the digital divide: myths and realities

This is my last version of a book contribution, before it was edited and proof-read.

For the final version as well as for reference, see:

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Comments on this text are still very much welcome.

Some of the statements made in this paper were valid at the time of writing (beginning of 2000) but subject to heavy debate now (summer 2002). The latest version of the Falling through the Net survey suggests that some divides are narrowing and that disparities along e.g. gender lines are diminishing. Others claim the opposite.

For my more recent writings on the digital divide, see www.steyaert.org/Jan/ under publications.

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Table of content

Introduction.....	2
Internet and inequality, key elements of the current analysis	2
Internet citizens: not a world of equals	2
Is there a divide? Some critical thoughts	3
Time	4
Access to internet, more than one dimension.....	6
Digital divide, also in information provision?.....	7
Conclusion: redefinition of the digital divide	8
References.....	10

Introduction

Within the context of the emerging information society, one of the most talked about concerns in the area of social quality is the digital divide. This fear focuses on the potential for a divide between those connected to the internet and those not connected, sometimes worded as the divide between the information have's and have's not. For some, the digital divide is about more than access to information but the repercussions of access on existing or new patterns of social exclusion.

This text will provide a description of the current analysis of the digital divide drawing on data from both Europe and North-America. One of the conclusions will be that technology does not create a new social divide but replicates the existing social stratification. Subsequently, three reflections on the current analysis will be introduced: the importance of time in the diffusion of innovations, the multidimensional nature of the concept 'access' and the imbalance in information availability. Combined, this results in a redefinition of the digital divide.

Internet and inequality, key elements of the current analysis

In 1995, Newsweek described the average internet-user as being politically conservative, white, male, single, English-speaking, living in North America and a professional, manager or student. Beyond doubt, that description is no longer valid. However, is the availability of the information highway more democratic now than it was in 1995? Many are concerned about the 'digital divide' creating new social exclusion, both on a global and a national level.

Although most of the debate on access to the internet focuses on differences on a national scale, the differences on a global scale are phenomenal (see also Jamal Shahin's contribution in this book). The platitude is that the telephone directory of the whole African continent is slimmer than that of Manhattan. This situation has not improved for telephones, but is even worse for access to the internet. Consequently, whole parts of the world are on the brink of total exclusion. Castells introduces the concept of 'technological apartheid' to refer to this process of disconnecting complete countries and poor neighbourhoods from the world's economic and social systems (Castells, 1998, chapter 2).

Internet citizens: not a world of equals

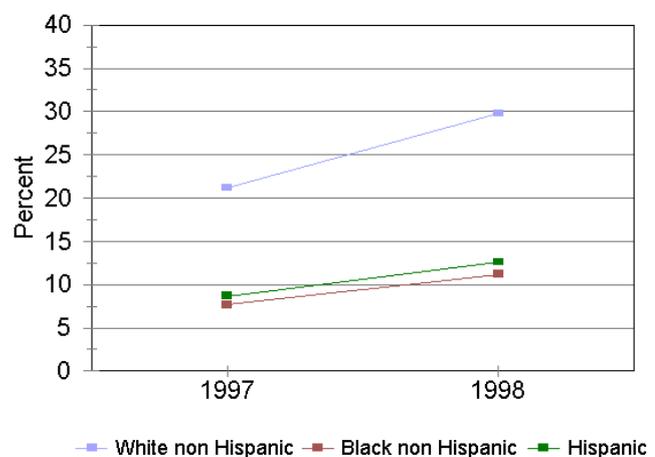
With great frequency, the Western media reports on new statistics regarding the internet penetration in society. Government, market and science have joined forces in a unique eagerness to 'keep the finger on the pulse'. The overwhelming majority of these reports have as most significant conclusion that the number of people with access to the information highway is increasing. More citizens are connected than 6 months or a year ago.

In addition to the observation that internet access increases rapidly, all available survey results indicate that this diffusion is not equally spread across all layers of the population. Between the different surveys there is however a great diversity in the quality of available information and the level of analysis carried out. Certainly for commercially based surveys, little background information on the respondents is gathered and/or made available. Consequently,

for a more in-depth analysis of diffusion patterns of internet, we have to rely on only a handful of studies. These include the almost annual survey by the US department of Commerce, National Telecommunications and Information Administration (McConnaughey, Lader, & et. al, 1999 and 2000) (and <http://www.ntia.doc.gov/>) and the more recent study of the Dutch Social and Cultural Planning Office (SCP, see <http://www.scp.nl/>) (van Dijk & de Haan, 1998; van Dijk, de Haan, & Rijken, 2000).

Both studies indicate that internet diffusion patterns follow the 'normal' faultlines in social stratification: men more than women, young more than old, well-educated more than low-educated, high-income more than low-income. NTIA also indicates differences between ethnic origin (whites and Asians more than African-Americans or Hispanics) and location (urban more than rural). The not-connected groups of the population can relatively easily be described: "It are the by now well know groups of our population which are not connected: (single) women, 65-plus, low-educated citizens and people with low-income." (van Dijk et al., 2000, p. 137).

Both studies indicate that the inequalities are increasing. Although this increase holds for many criteria (by gender, education, ...), one example of access by ethnic background can suffice to illustrate the trend. While in 1997 the difference between rates of internet access between White non Hispanic citizens (21.2 %) and Hispanic citizens (8.7 %) in the USA was 12.5, in 1998 this had increased to a 17.2 difference. Only in the high-income groups, inequalities seem to be decreasing (McConnaughey, Lader, & et. al, 2000, p. 17 and 30)



From the plethora of rapidly changing data, the picture that emerges is that the digital divide does not create new faultlines in society, but by and large replicates the existing social stratification (at least when defined in terms of physical access, see section on dimensions of access).

This observation seems to contradict some of the social projects in which technology is used to give disadvantaged people or deprived neighbourhoods a head start, e.g. telework for functionally impaired citizens, technology courses for low-skilled long-term unemployed people or community access centres in deprived areas. While these projects make a substantial difference for those concerned, they are not yet able to generate a multiplication effect beyond their direct participants.

Is there a divide? Some critical thoughts

The Western world buzzes with rumours about a digital divide. Media, science, policy and market communicate their statistics, points of view, concerns and their good intentions to address the issue quickly and profoundly. Amidst this sense of urgency, it is tempting to reduce speed and offer a couple of strategic reflections. At least three key elements seem to be missing from the mainstream debate: the dynamic perspective on diffusion of innovations, the

multidimensional nature of access and the imbalance in available information on the information highway.

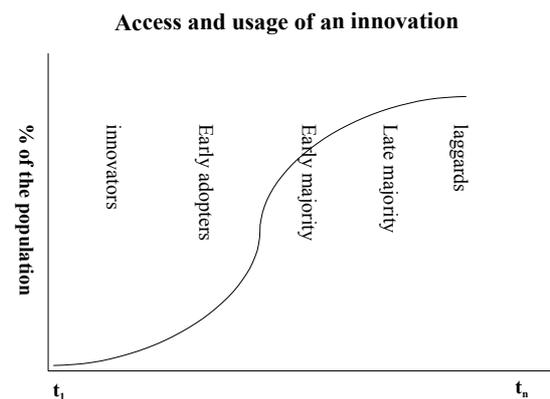
Time

Some innovations appear to conquer the world in no time (e.g. Teletubies or Pokémon-cards). Most however go through a relatively slow process of development and diffusion in society. At each point of time, a certain percentage of the population has access to a given innovation, uses it and has acquired the necessary skills. Time is a critical element in the diffusion of innovations.

Diffusion processes of previous innovations (telephone, radio, television, ...) can be described as a S-curve in which different groups of the population adopt the innovation. Rogers refers to these groups as: innovators, early adopters, early majority, late majority, laggards (Rogers, 1996).

This theory states that innovations diffuse through society starting with a small group of innovators and, once having reached a critical mass, seeps through to all layers of society until it reaches a point of 'saturation'.

Some diffusion curves can be long and stretched (the telephone needed 67 years in the USA to reach 75 % of households) while some can be very short and dense (the television needed only 7 years) (Putnam, 2000, p. 217).



The diffusion of the information highway had a very slow start. For decades, the basic infrastructure was available but user-friendliness was totally missing, there were no internet service providers and the technology was unreliable. At short notice, this has all changed. The technology has now become reasonably reliable (though I still wouldn't dare to drive a car with this level of reliability), a whole industry of internet service providers has emerged and diffusion of access is coming up to speed. After the introduction of a graphical browser, the availability of free internet accounts (although this is hardly equal to free internet access) in many European countries has been a significant stimulus for increased diffusion.

Not only the diffusion of access and usage of an innovation needs to be considered, also the innovation itself transforms. As time progresses, the innovation matures, becomes more reliable, user-friendly and offers more functionality. Such developments will heavily impact the speed of diffusion in the second half of the S-curve. The early innovators who can cope with lack of user-friendliness and unreliability have already adopted the technology, the speed with which the late majority joins in will depend on the maturity of technology and its perceived value.

Near the end of the curve, the diffusion pattern will be characterised by differentiation in quality. The development and diffusion of the car is a good illustration. In the first part of the curve, the big break-through was achieved with the introduction of the Ford-T, which was reasonably cheap thanks to uniformity and new production techniques (the assembly line) (Flink, 1989). Later on, the variety in cars increased up to a point where each car is specifically made according to the wishes of a specific buyer (make, model, colour, type of engine, ABS, airbags, extras, ...).

On the information highway, we see an equivalent development with differences in price and quality of access emerging, e.g. access over telephone, ISDN, ADSL, ... with or without own webspace, with or without own domain name, with or without free support. This results in some people describing the digital divide no longer in terms of having access to a computer and internet, but in terms of available bandwidth (Wilhelm, 2000).

The legal framework of 'universal access' that regulates equality in availability and pricing of telephone services, regardless of the location of the customer, currently does not have a full equivalent for internet services, although important work is being done (McConnaughey, 1999). Today, companies can roll out their broadband access in those areas with high revenue potential, without any substantial incentive or obligation to offer similar services in low-income areas. As such, there is currently a growing divide between those geographical areas with broadband services and the majority of (rural) areas where it is not.

But will more access also imply more egalitarian access? At what point can we be satisfied with the diffusion and social distribution of access and when do we have to be concerned about a digital divide? Several scenarios are possible:

- the diffusion of internet access progresses, but too slow compared with other regions in the world. At this moment North America is in lead position, with the Scandinavian countries taking the lead in Europe. Being connected has an influence on the international economic attractiveness of countries. It also creates a critical mass for e-commerce, e-government and other e-activities. To have the highest number of connections per population might be a significant macro-economic goal for countries (as it is now for many internet service providers). Without such a high degree of connectiveness, one might talk about a digital divide. The European Union Prime Ministers, at their meeting in Lissabon in April 2000, launched their ambitious e-Europe plan with this digital divide in mind.
- The diffusion of internet access increased to 85, 90, 95 %, but there is a specific group of citizens who are not connected, similar to the telephone system. Once the normal diffusion processes have done their work, will such a group exist? Will there be a category of citizen who structurally cannot get access? If such a group does exist, this is certainly another form of digital divide that should be addressed by appropriate policy measures.
- Finally, there can be a group of citizens who are not connected, but do not wish to be connected, similar to the television system at the moment. Even now there are indications that some persons acquire access, make use of the internet and subsequently disconnect (Wyatt, 1999). The paradigm of ever increasing number of connections with 100 % of citizens connected does have alternatives. The number may stagger at 70, 80, ...% or can even start to decline if and when more appropriate technologies emerge (e.g. when telephone replaced the telegraph).

Will society enable citizens to choose not to be connected (as is now the case with television) or will such choice be burdened with heavy consequences (as is now the case with e.g. choosing not to have a bank account)?

For research and policy on the digital divide, this situation implies that a differentiation is needed between those groups that are not connected as a result of informed choice or because of lack of awareness or because of some structural threshold (financial, skills, ...).

Some use the dynamic perspective on the diffusion of the information highway as an argument to reason against digital divide policy. The conservative Heritage Foundation writes: "clearly, the vibrant PC market is doing more than an adequate job of providing computing technologies to all Americans. Free computers and inexpensive technologies are

filling any digital divide that remains. Washington should be patient and not interfere with this well-functioning process” (Thierer, 2000). Such discourse however totally neglects the multidimensional character of the concept of 'internet access'. Access to the physical infrastructure is just the first building block of the information society.

Access to internet, more than one dimension

Skills to handle the technology

"The ICT revolution plays an important role in the functioning of the labour market, through the reshaping of work, skill structures and the organisation of work. As the new technology is an information technology, it requires not only stronger basic skills in numeracy and literacy, but also a new form of basic skill, the skill of interaction with the new technology, let us call it 'informacy'." (European Commission, 1996)

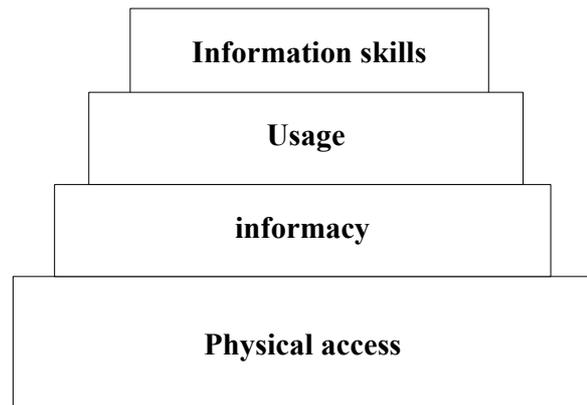
Despite the myriad of studies on access to internet, there is little data available on informacy, on how well people can handle the technology. One Dutch research from 1997 gives an overview of digital skills of the Dutch population (Doets & Huisman, 1997). A sample of their findings: one third of the population never puts on a CD, slightly more than half of the population never uses teletext and never programmes the video recorder. One quarter of the population never takes money out of a cash dispenser, almost half of the population never uses plastic money. Each of these figures refers to the population having access to the technology, not the overall population!

Although 60 % of the population (in 1997) had access to a personal computer -at home or at work- only one third regularly uses it. It is not surprising to observe that in all these data, the elder population makes limited use of the technology and has fewer digital skills.

The already mentioned SCP study also contains data on digital skills. On the level of literacy, 1 % indicated they cannot search for a telephone number in the directory, 10 % cannot read contracts and 39% cannot fill in their tax forms. Regarding numeracy, 18 % indicates they cannot read graphs or read tables and 4 % cannot estimate the total costs when they go shopping. For informacy, 53 % replied having trouble with searching information on internet, and 15 % indicate this is sheer impossible for them.

Usage

Currently available data on internet access do not generate a clear picture of what is done with access. There are some indications that although on the level of physical access the digital divide along lines of gender is closing (women get access on equal terms with men), there is a substantial difference in usage patterns. This applies to the quantity of usage (men are much longer on-line) as the kind of usage. Men use the internet more to download software and search databases, while women do this much less (van Dijk et al., 2000, p. 144). There are some indications that men use the internet more for work-related issues, while women use it more for educational purposes (McConnaughey et al., 1999, p. 69). Similar to other media such as the telephone and the television, equal access still generates different patterns of usage along the traditional faultlines of gender, education, income and the like.



As democratic physical access becomes less problematic, we will observe a shift in survey data away from physical access into the area of usage. An important issue that will emerge is whether difference in usage patterns are the result of personal choice or from context (e.g. access at work or at home, socio-economic context of the user, ...) and to which extent difference in usage has socio-economic implications for the citizen and society.

Information skills

In a situation of equal physical access, equal informacy and equal usage patterns, we would still not have all the elements to build an egalitarian information society.

A recent study from the Dutch technology assessment institute (Steyaert & Mosselman, 2000) distinguishes between three layers of information skills that are relevant for the emerging information society:

- *Instrumental skills*: the ability to use technology, to handle the basic functionality of the hardware and/or software involved. These instrumental skills are similar to the notion of informacy and targeted by initiatives such as the European Computer Driving Licence (<http://www.ecdl.com/>).
- *Structural skills*: the ability to handle the new formats in which information is communicated. These involve e.g. the skill to look for information interactively (e.g. through listservs), to make good use of the hyperlink structure of electronic information, ... These skills are relatively new and are induced by the technology.
- *Strategic skills*: the attitude to use information as a basis for decision making, involving an attitude to look for information before taking action, to continuously scan the information environment for relevant items, to translate information into consequences and implement necessary or possible actions, .. This level of strategic skills is not new, as it is as relevant in relation to traditional media (television, newspapers, ...) as for new media. However, the technological innovations have not only provided us with tangible products and services but have also provided one of the foundations for a society that is very information-intensive. Consequently, these strategic information skills will become of paramount importance.

Digital divide, also in information provision?

The digital divide cannot be reduced to having or not having access to the information highway. The differences in supply of information also has to be taken into account.

In the early days of the internet, information was basically only available if it concerned computers or some other tangible form of technology. That era is over. Internet now offers not only a much bigger supply of information but also much more variety. Both can be described as progress, but that would be simplistic. Nor the quantity nor the variety of information as such makes it better information.

In the statistics about the growth of internet, operationalised by number of internet-users, number of web servers, number of webpages, ... all data are treated equal. It is consequently not surprising all data show upward trends. However, if one were able to differentiate between kinds of data and e.g. identify all pornographic or violent content, a different picture would probably emerge. A large part of the appealing information-sharing character of internet loses its attraction. This is not dissimilar from television. At the early days of television, this medium was welcomed as being the platform for the education of the future and people could see a bright future for a 'learning society'. It's hard to imagine such optimism if one reflects on the 'content' to today's television channels.

In the computer shop, multimedia such as the 'Encyclopedia Britannica' and CD-ROMs full of dingy pictures or violent games (e.g. Carmageddon: the more pedestrians you run over, the more points you get) sit next to each other on the shelves. On the internet, you can as easily

find information on e.g. Marquis de Condorcet or Pieter Breughel as on why all niggers are dumb or immigrants should return to their native countries. Try it.

The expansion of information available through the electronic highway turns the latter into a more useful instrument, but doesn't necessarily imply it is equally relevant to all groups in society. A sample of information needs of citizens in lower socio-economic groups is provided in *The information poor in America* (Childres & Post, 1975):

- Where is the most accessible and cheap child care in this neighbourhood;
- How can I get rid of the rats in the vacant house next door;
- My husband left me, what can I do;
- How can I know there is lead in the plumbing or painting of this rental flat;
- Where do I get some money to buy us food up to the next pay-cheque;

None of these information needs is addressed by the information currently available on the information highway. Why is it then that lower socio-economic groups have lower rates of internet access?

A recent study of the North American Children's Partnership identifies four thresholds in the current information supply, making it less relevant for low-income Americans (Lazarus & Mora, 2000):

- there is a lack of local information, which is immediately relevant for the community in which people live, such as information about employment opportunities, local housing market, local activities;
- there are literacy barriers, in that most information is made available in a format that requires a substantial level of reading skills;
- there is a language barrier. The overwhelming majority (estimated to be 87 %) of all internet information is in English, while this is not the native language of many low-income Americans. On a global scale, this dominance of English is even more worrying;
- there is a lack of cultural diversity, very few internet content is generated by ethnic communities.

On the basis of these thresholds and taking into account the overlap between the different groups of the population facing them, the study estimates that about 20 % of the USA population 'face one or more content-related barriers that stand between them and the benefits offered by the Internet'. Again, this illustrates that physical access to the internet is just one of the many building blocks of the digital divide.

Conclusion: redefinition of the digital divide

In media and policy, we can witness a profound concern about the emergence of a digital divide and the creation of a divide between the 'information have's' and 'information have-not's'. Proposals are being launched and policies developed to guarantee everybody access to the internet. The focus is however mostly on physical access, one of the elements that are less critical to achieve an egalitarian information society. Providing physical access lies within the interest of commerce and government (establishing a critical mass of e-citizens for e-commerce and e-government). Moreover, physical access will diffuse in society as media converge and internet can be accessed over television, a future development that is predicted by many and already happening with WebTV.

Although physical access to computers and networks appears to be problematic on the short run, there are two more critical and long-term bases for a digital divide:

- *Technology-illiteracy*: not everybody has the same efficiency and effectiveness in operating technology. Especially senior citizens are having problems with modern technology, as they no longer acquire the necessary skills through education or employment. But not only senior citizens have a high risk of being technology-illiterate. Observe how many can program the video to record a television program two days ahead. And a video is far simpler than a computer, or many of the digital machines that take over face-to-face service delivery, such as train ticket machines, automatic cash dispensers and the like.

Partly, technology-illiteracy will be addressed by maturing technology and new, more user-friendly user interfaces will appear (Norman, 1999).

- *Information-illiteracy*: imagine everybody would have the same physical access to computer networks and have the same level of technology-literacy to handle them (similar to the current situation of the television medium), would we have an egalitarian information society?

Not all citizens have the same level of information-literacy: the ability and attitude to search for relevant information, translate that to one's own situation and implement the necessary actions. This is the most critical element that makes the 'digital divide' a societal issue of extreme importance. However, it is not a digital issue as such as it equally applies to traditional media. It was first identified in the late sixties and became known as the 'knowledge gap theory' (Gaziano, 1997): "As the infusion of mass media information into a social system increases, segments of the population with higher socioeconomic status tends to acquire this information at a faster rate than the lower status segments, so that the gap in knowledge between these segments tends to increase rather than decrease." (Tichenor, Donohue, & Olien, 1970, p. 159).

In order to use the previous analysis in developing policy to reduce the digital divide, such policy needs to include three ingredients:

- *Availability of access*: the inequality in access to new media can be targeted by offering all citizens a choice of alternative access scenarios, e.g. through the local library, free e-mail accounts or some form of community access point. Policy and activities in this area are being initiated throughout the Western world. There is a wide variety among the different activities: some are focused on the individual (e.g. free e-mail), some target groups (e.g. seniornet.org targets a certain age group, community access centres target people from the neighbourhood). Some stimulate the demand-side (provide access), some the supply-side (digital cities, content provision, ...). Such variety is no weakness, as it reflects the variety of contexts from which these initiatives emerged.
- *Universal access*: when telephone technology emerged, a legal framework of universal access was developed. Although the background of this concept is debated, the outcome was to make access to this new technology more democratic than market forces alone would have been able to make it. For the new media, no such legal frameworks are currently existing, although some developments are taking place (McConnaughey, 1999). Universal access can however no longer be confined to the commercial aspects of innovations, but equally needs to target the technology as such. The situation in the USA is a telling example of what can be achieved. The 1992 re-issue of the Rehabilitation Act indicates that government agencies in their procurement of products and services need to take into account accessibility. This and similar laws have resulted in companies like Microsoft, Adobe or Corel making a real investment in improving the accessibility of their software¹. By expanding the notion of universal access into this area of 'design-for-all', a lot can be gained.

¹ <http://www.microsoft.com/enable/>, <http://www.corel.com/accessibility/> and <http://access.adobe.com/>

- *Skills*: availability of access and universal access are strategies on the level of physical access. As indicated before, this is just one of the conditions for democratic availability of new media. Likewise, policy and initiatives need to focus on information skills, either through education (e.g. <http://www.big6.com/>) or alternatives.

There's a bit of a hype around the digital divide at the moment. The mainstream analysis and policy however focus on physical access. Policy targeting universal access of information literacy draws less attention. This tension between policy on physical access or information literacy can be compared to development support for the third world. This can be emergency aid and have a short-term perspective (food, urgent medical care, tents for refugee camps, ...) or can be more structural aid and have a longer perspective (education, traffic infrastructure, ...). It is a simplicity to state that one or the other is deemed to fail, both are needed to make a real impact. Likewise in the area of the digital divide.

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