

INFORMATIONAL CAPITALISM AND THE DIGITAL DIVIDE IN AFRICA

by

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In this paper we present a critical theoretical notion of the digital divide in informational capitalism. Digital divides are seen as the result of the inherent asymmetry of accumulation processes in the economic, political, and cultural system of contemporary society and resulting structural inequalities. The empirical part of the paper discusses the digital divide in Nigeria as an example from Africa and shows besides the severity of the situation that the policies of liberalization and privatization haven't improved the problem. In the last section we identify six potential strategies for the solution of digital divides. We argue that five of them are one-dimensional and short sighted, advanced a critique and deconstruction of neo-liberal solutions, and argue that an integrative strategy aiming at social, political-economical, and technological change is needed.

INTRODUCTION: INFORMATIONAL CAPITALISM [1]

The notion of informational capitalism was first introduced by Manuel Castells (2000) who can be considered as the most important and influential figure in information society research. However, a more theoretical account of this notion is still missing (cf. Fuchs 2007, 2006a, b). The concept of informational capitalism is here employed for stressing that the production and accumulation of economic, political, and cultural capital (in the Bourdieuan

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sense) is increasingly shaped by knowledge work and networked, computer-based information and communication technologies. In contemporary society production, exploitation, power, hegemony, and struggles are increasingly organized with the help of and embedded into transnational networks: The productive forces are strongly based on computerized network technologies, the relations of production are taking on transnational networked forms that result in the emergence of a flexible regime for the accumulation of economic, political, and cultural capital and the rise of transnational organizations that try to centralize power. The stratifying and centralizing accumulation processes that make use of networks are challenged by alternative transnational networks. The rise of global networks advances the antagonism of the collective and networked production of capital and its individual appropriation and the antagonism of the networked productive forces and the relations of production (Fuchs 2007, 2006a). At the heart of informational capitalism is an antagonism of information as commodity and information as gift, it is made up of two interwoven and antagonistic systems: a commodity economy and a gift economy (Fuchs 2006b). Given all of these conditions it is feasible to speak of contemporary society as transnational network capitalism or global informational capitalism. The historical novelty is not that social relationships are networked, but that processes of production, power, hegemony, and struggles take on the form of transnational networks that are mediated by networked information- and communication technologies. Global informational capitalism is based on a transnational organizational model, organizations cross national boundaries, the novel aspect is that organizations and social networks are increasingly globally distributed, that actors and substructures are located globally and change dynamically (new nodes can be continuously added and removed), and that the flows of capital, power, money, commodities, people, and information are processed globally at high-speed. Global network capitalism is a nomadic dynamic system in the sense that it and its parts permanently reorganize by changing their boundaries and including or excluding various systems by establishing links, unions, and alliances or getting rid of or ignoring those actors that don't serve or contribute to the overall aim of capital accumulation. Hence global informational capitalism is a stratified class-society. It is in this context that the phenomenon of the digital divide can be discussed.

THE DIGITAL DIVIDE DEFINED [2]

Manuel Castells defines the digital divide as “inequality of access to the internet” (Castells 2002: 248). Access to the internet is moreover “a requisite for overcoming inequality in a society which dominant functions and social groups are increasingly organized around the internet” (Castells 2002: 248). Jan van Dijk who can besides Manuel Castells be considered as the most important theorist of the network society defines the digital divide as “the gap between those who do and do not have access to computers and the internet” (Van Dijk 2006: 178). Pippa Norris sees it as “any and every disparity within the online community” (Norris 2001: 4), Ernest J. Wilson III as “an inequality in access, distribution, and use of information and communication technologies between two or more populations” (Wilson 2006: 300).

Which types of the digital divide can be identified? Jan Van Dijk and Kenneth Hacker (2003) argue that there are four types of barriers to access:

- a) The lack of “mental access” refers to a lack of elementary digital experience.
- b) The lack of “material access” means a lack of possession of computers and network connections.
- c) The lack of “skill access” is a lack of digital skills.
- d) The lack of “usage access” signifies the lack of meaningful usage opportunities.

Van Dijk has demonstrated that in terms of physical access to computers and the internet, the digital divide is closing in developed countries, whereas in developing societies it is still growing. In terms of skill access and usage access, the digital divide is both widening and deepening. He argues that information skills (the skills needed to search, select, and process information in computer and network sources) and strategic skills (the capacities to use these sources as the means for specific goals and for the general goal of improving one’s position in society) as aspects of the skill access are “extremely unevenly divided among the populations of both developing and developed societies” (Van Dijk 2006: 181). Concerning usage access Van Dijk has found that people with high levels of education and income tend to use database, spreadsheet, bookkeeping, and presentation applications significantly more than people with low levels of education and income who favour simple consultations, games, and other entertainment (Van Dijk

2006: 182sq). It is naive to believe that mental and material access is enough so that problems of skill access and usage access will diminish (Van Dijk and Hacker 2003). But faith in bridging the digital gap in this way is widespread in science.

Pippa Norris (2001) describes the digital divide as a multidimensional phenomenon. She distinguishes between the global digital divide, the social divide, and the democratic divide:

Table 1: Pippa Norris' dimensions of the digital divide (Norris 2001: 4)

Types of digital divide	Signified by
Global divide	Divergence of internet access between industrialized and developed societies
Social divide	Gap between information rich and poor in each nation
Democratic divide	Difference between those who do, and do not, use the opportunities of digital resources to engage, mobilize and participate in public life

For Norris the social divide includes the income gap, which makes a difference between those who can afford computer and internet access and those who can't. Castells furthermore identifies an education gap, an ethnical divide, an age gap, a family/single gap, and an ability/disability gap (Castells 2002). For Wilson (2006) there are eight aspects of the digital divide: physical access (access to ICT devices), financial access (cost of ICT services relative to annual income), cognitive access (ICT skills), design access (usability), content access (availability of relevant applications and information online), production access (capacity to produce one's own content), institutional access (availability of institutions that enable access), and political access (access to the governing institutions where the rules of the game are written). Wilson relates these eight aspects to six demographic dimensions of the digital divide: gender, geography, income, education, occupation, and ethnicity.

The core of society consists of three subsystems (cf. Fuchs 2005, 2003a):

the economic system in which use values and property that satisfy human needs are produced, the political systems in which power is distributed in a certain way and collective decisions are taken, and the cultural system in which skills, meaning, and competencies are acquired, produced, and enacted in ways of life. This distinction can e.g. be found in the works of Anthony Giddens who says that symbolic orders and forms of discourse are concerned with the constitution of rules (culture), that political institutions deal with authoritative resources (polity), and that economic institutions are concerned with allocative resources (economy) (cf. Fuchs 2003c); as well as in the works of Pierre Bourdieu who distinguishes economic, political, and cultural capital as the three structural features of society (cf. Fuchs 2003b). Hence we argue that besides general social forms of the digital divide, there is also an economic divide, a political divide, and a cultural divide.

Technologies enable and constrain human practices, their main dimensions are the material access to them (in modern society mainly with the help of money as technologies are sold as commodities), the capability to use them, the capability to use them in such ways that oneself and others can benefit, and embedding institutions. The digital divide refers to unequal patterns of material access to, usage capabilities of, and benefits from computer-based information- and communication technologies that are caused by certain stratification processes that produce classes of winners and losers of the information society, and participation in institutions governing ICTs and society. Material access refers to the availability of hardware, software, applications, networks, and the usability of ICT devices and applications. Usage and skills access refer to the capabilities needed for operating ICT hardware and applications, for producing meaningful online content, and for engaging in online communication and co-operation. Benefit access refers to ICT usage that benefits the individual and advances a good society for all. Institutional access refers to the participation of citizens in institutions that govern the internet and ICTs, and to the empowerment of citizens by ICTs to participate in political information, communication, and decision processes. Stratification patterns are on the one hand social hierarchies such as age, family status, ability, gender, ethnicity, origin, language, and geography (urban/rural). These categories have resulted in different types of the social divide. On the other hand unequal patterns of material access, us-

age capabilities, benefits, and participation concerning ICTs are also due to the asymmetric distribution of economic (money, property), political (power, social relationships), and cultural capital (skills). Hence there is also an economic divide, a political divide, and a cultural divide. In modern society structures take on the form of capital that is accumulated and unevenly distributed so that different social classes and class fractions with a different (high, medium, low) total amount of economic, political, and cultural capital are created (cf. Fuchs 2003b). The reason why there are gaps in access, usage/skills, benefit, and participation concerning ICTs is the multi-dimensional class-structure of modern society that creates structural inequalities. People with high income, far-reaching and influential social relationships, good education and high skills are much more likely to have access to ICTs, to be capable of using ICTs, to benefit from this usage, and to be supported in political participation by ICTs than people who are endowed with only a little amount of economic, political, or cultural capital. Table 2 summarizes aspects and dimensions of the digital divide.

Table 2: Aspects and dimensions of the digital divide

	Economic capital	Political capital	Cultural capital	Age	Family status	Gender	Ability	Ethnicity	Origin	Language	Geography
Material access											
Usage and skills access											
Benefit access											
Institutional Access											

Jeffrey James (2003: 45) defines the global digital divide as “the strikingly differential extent to which rich and poor countries are enjoying the benefits of information technology” and as “the unequal distribution of computers, internet connections, fax machines and so on between countries” (James 2003: 23). What Pippa Norris and Jeffrey James call the global digital divide

is mainly an aspect of the economic divide because it concerns the difference in access to and usage of ICTs between rich countries and poor countries. Poor countries are those endowed with little economic capital, people there are much less likely to be able to access ICTs, to know how to use them, to benefit from usage, and to participate in embedding institutions. Developing countries are not only economically excluded, but also deprived of political power and cultural skills needed for active participation in the information society.

AFRICA AND THE DIGITAL DIVIDE: THE CASE OF NIGERIA [3]

Table 3 presents an actual internet usage statistic for Africa (Africa internet Usage and Population Stats, data from 2006). An internet user is in this statistical analysis defined as a person having available access to an internet connection point and the basic knowledge required to use the internet (<http://www.internetworldstats.com/surfing.htm>).

*Table 3: Internet usage in Africa and on the globe 2006
(Source: Internet World Statistics: <http://www.internetworldstats.com/stats1.htm>, data accessed on November 1st, 2006)*

REGION	Population (2006 Est.)	Share of World Pop.	Internet Users, Latest Data (March 2006)	Internet Penetration (% Population)	% Users in World
TOTAL FOR AFRICA	915 210 928	14.1%	32 765 700	3.6%	3.0%
REST OF THE WORLD	5 584 486 132	85.9%	1 053 485 203	18.9%	97.0%
WORLD TOTAL	6 499 697 060	100.0%	1 086 250 903	16.7%	100.0%

Although Africa makes up 14,1 percent of the world population, only 3,0 percent of all internet users live in Africa. In 2006 of 57 African countries only 3 countries had access rates higher than the worldwide internet usage

rate of 16,7% (Reunion, Saint Helena, Seychelles), and only six of 57 African countries had access rates higher than 10% (Fuchs/Horak 2007). 20 of the 57 African countries in 2006 had access rates lower than one percent (Ibid.). This shows that the digital divide is a very pressing problem – most African countries are excluded from informational capitalism. If the information society should really be a global village (Marshall McLuhan), a digital agora, or virtual community (Howard Rheingold), internet access and usage for developing countries would have to be assured because communities and democracy are inclusive and participatory rather than exclusive and segmented. Cyberspace in its current form as a socio-technical system that only gains meaning through human activities and communication is a segmented space that reflects the inequalities of society. Concerning Africa one hence can also speak of a digital apartheid that has real-world causes such as the unequal global distribution of resources. Digital apartheid means that certain groups and regions of the world are systematically excluded from cyberspace and the benefits that it can create.

As an example of the global digital divide we will now discuss the situation in Nigeria (for a discussion of Ghana and South Africa as two other examples see Fuchs/Horak 2007). In 2005 Nigeria was among the least developed countries in the world, with a HDI of 0,453 it was ranked number 158 out of 177 countries (UNHDR 2005: 221). In 2003 the life expectancy at birth was 43,4 years, the adult literacy rate 66,8% (Ibid.: 221). In 2003 90,8% of the population had to live on less than \$2 a day, and 70,2% on less than \$1 a day (Ibid.: 229). In 1996 (latest available data) the richest 10% of the population had 40,8% of the income, the poorest 10% 1,6% (Ibid.: 272). Nigeria is the country with the 21st highest income inequality in the world (2005, Gini coefficient=50,6, UNHDR 2005: 272).

The recent history of Nigeria, a former British colony that gained independence in 1960, has been characterized by frequent military coups and changing totalitarian regimes, ethnic violence, and civil war. Ibrahim Babangida became head of state in 1986 after yet another military coup. He agreed to sign up to the IMF's Structural Adjustment Program which has resulted in a continued focus of Nigerian politics on privatization and deregulation of the economy. Babangida was overthrown in 1993 by Sani Abacha who died in 1998. After Abacha's death Olusegun Obasanjo gained

power as head of state after elections were held. The Obasanjo government has continued the neo-liberal reforms that were in former times rather blocked by political instability and has accelerated the speed of privatization and liberalization.

In 1985 Nigerian Telecommunications Limited (NITEL) was established as a public monopoly provider for telecommunications services by a merger of two prior existing public telecommunications institutions. In 1992 the Nigerian Communications Commission (NCC) was founded in order to provide licenses to private telecommunications operators. NITEL (which provides fixed lines as well as mobile lines (Mtel)) was privatized in 2006, the Nigerian firm TransCorp purchased 75% of the company's shares. In the cellular phone market the major providers are MTN, Econet, NITEL, and Globacom. In the area of fixed lines there are NITEL and Globacom. One also finds a number of smaller private operators such as Mobitel, Multi-Links, Reliance, Starcomms, and Intercellular in the areas of telephony and internet.

The National Policy of Telecommunications by the Federal Ministry of Communication of Nigeria (2000) has set itself as a goal the "total liberalization, competition and the private sector-led growth of the telecommunications sector", it argues that the "longer term objective of this policy is to enable all Nigerians [to] have access to all forms of modern information and communication technologies and services" and that "the privatisation programme is guided by the primary objective of expanding access to communications for all Nigerians, and ensuring that services are as affordable and technically advanced as possible". The dogma that privatization and commercial and profit-oriented organizations best advance universal service and universal access for all is never questioned. Experiences from many countries show that privatization and private investment can improve the quality and speed of telecommunications services, but there are several reasons why it is unlikely that such policies will promote universal access for all in developing countries:

a) Private-led companies are first of all profit-oriented which means that they will provide cheap access only as long as they are not faced by crisis which is an integral feature of capitalism and competitive markets. Hence there is an antagonism between cheap (or even free) access and the capitalist crisis economy.

b) Increasing quality and speed of services require continuous investments,

the fixed capital costs will increase which requires increases in tariffs so that profitability is assured. Hence the poor and low-income classes might not be able to afford access. This is especially a problem in countries with high income inequality such as Nigeria.

c) Private firms might see the poor and low-income classes as financially weak and might want to focus on financially strong customers and hence exclude the first from their services.

Several critical studies have questioned the idea that privatization brings more well-being and quality of life to the poor in Nigeria (Ariyo/Jerome, 2004; Igbuzor, 2003; Osimiri, 2006).

Table 4: Telecommunications statistics for Nigeria

Year	Internet Users per 100 Inhabitants	Internet Subscribers per 100 Inhabitants	PCs per 100 Inhabitants	Total annual investment in telecom (in million US\$)	Total Phone Subscribers (Mobile and Fixed) per 100 inhabitants	Price of 3-minute fixed telephone call (peak prize)	Price of a 3-minute local mobile call (peak rate)
1993		0,45	0,40	448	0,35	5,8	23
1994		0,19	0,43	458	0,37	5,8	23
1995		0,21	0,48	771	0,41		23
1996	0,01	0,20	0,53	1009	0,41		
1997	0,02		0,57	1090	0,40		
1998	0,03	0,49	0,61	1611	0,43		
1999	0,05	0,56	0,64	394	0,46		
2000	0,07	0,27	0,66	355	0,51		
2001	0,10	0,26	0,68	710	0,86	12,9	120
2002	0,35	0,47	0,71	1217	1,92	12,9	117
2003	0,61	0,69	0,70	-	3,27	12,9	50
2004	1,39		0,68	2780	8,00	19,5	36
2005	3,80		0,68	3287	15,07		

The statistics in table 4 show that the accelerated speed of neo-liberal re-

forms since 1999 has increased the capital investments in telecommunications, but the number of internet subscribers per 100 inhabitants is in 2006 still below 1 user per 100 inhabitants and the price of phone calls from mobile and fixed lines is today much more expensive than 10 years ago. So e.g. a three-minute local call at peak time from a fixed line was in 2004 almost three times as expensive as in 1994. The number of total phone subscribers and internet users has increased during the last years in Nigeria, but that more people can afford owning a phone doesn't mean that they can afford using it. Also the number of internet subscribers and PCs per 100 people is still far below 1%,¹ which is an indication that people (besides a lack of skills) lack the financial capacities for participating in the information age. In 2005 the average dial-up internet access cost US\$67 per month and the average cost for wireless access was US\$1000 per month (Adomi 2005), whereas the per capita income per month was US\$87,5 (UNHDR 2005: 221). In Nigeria besides financial access and skills access also power outages pose a problem for ICT usage (Adomi, 2005; Oyelaran-Oyeyinka/Adeya, 2004). Liberalization and privatization of telecommunications markets haven't solved the problem of the digital divide in Nigeria. This result is similar with the situation in other African countries such as Ghana and South-Africa that have experienced heavy phases of neo-liberal deregulation (cf. Fuchs/Horak 2007). Nigeria is a country in which many people don't have access to a phone, let alone internet. This is an expression of the globally stratified class structure of informational capitalism. A study based on a total of 5616 interviews in Nigeria has shown that 36% of the respondents have to travel to other towns for making phone-calls, the average travel distance is 51 km, and the average duration for such a trip 1 hour and 41 minutes (Intelcon 2005).

Some scholars have expressed hopes that the internet could be a technological fix to Nigeria's social problems. So e.g. ISOC Nigeria (2005), Chris O. Ahiakwo (1999), and Mike Jensen (1999) argue rather naively that telemedicine can provide a solution to the lack of medical practitioners in Nigeria because patients and doctors could be connected to doctors in developed coun-

¹ That there is an increase in internet users per 100 inhabitants might be due to the popularity of cyber cafés in Nigeria (Adomi 2005, Adomi/Adogbeji/Oduwole 2005, Oyelaran-Oyeyinka/Adeya 2004). In 2005 there were more than 2000 cyber cafés in Nigeria, most of them in Lagos (Adomi 2005).

tries. Telemedicine “will greatly face a change to the old and obsolete Nigerian medical system, thus granting even the people that cannot afford good medical attention without having to travel out” (ISOC Nigeria 2005). Similar hopes were expressed by the Nigerian Minister of Science and Technology in his opening address at the conference at which the papers by Ahiakwo and Jensen were presented. Internet can improve health and other social communication, but first of all among other things much more financial resources and skilled practitioners are needed on site in developing countries.

Another suggestion for improving the situation is to install centres that allow free access to computers and the internet, to conduct internet awareness campaigns, and organize courses in digital literacy (e.g. ISOC Nigeria 2005). Although this strategy also ignores larger societal issues such as the income divide between developing and developed countries, it at least is looking for public institutions and considers free access as important, whereas the commercial strategy simply sees capital accumulation with the help of ICTs as a solution.

Liberalizing telecommunications markets hasn't solved the problem of the digital divide in Nigeria and if there is a technological fix to social problems is highly questionable. These two strategies are two frequently suggested solutions, but as the more systematic discussion of strategies that will follow now shows there are alternative and less one-dimensional strategies for solving the problem of the digital divides.

SOLUTIONS TO THE GLOBAL DIGITAL DIVIDE? [4]

We agree with Jan van Dijk that “most likely, the digital divide within developing countries and between them and the developed world will continue to rise” (Van Dijk 2005: 185). But this is only the case if the current unequal economic and social development of global society continues, which clearly is not a foregone conclusion. We will now discuss six potential strategies for dealing with the global digital divide.

Wolfgang Hofkirchner (2002) has introduced a typology of worldviews that is based on the potential relationships between two categories: Reductionism establishes identity by eliminating the difference for the benefit of the smaller, less differentiated part, projectionism establishes identity by eliminating the difference for the benefit of the larger, more differentiated

side, dualism eliminates identity by establishing a difference of the two sides, it is a disjunctive approach, finally dialectical thinking integrates the two sides so that the two sides have different and identical aspects, they yield a unity in diversity. Applying this typology to the realm of identifying potential solutions for the digital divide means to consider technology as one category and society as the other. Technology in this case is the less differentiated side, it forms a part or subsystem of society.

Table 5: A Typology of Potential Solutions to the Digital Divide

Worldview	Technology	Society
Reductionism	Technological Reductionism: Innovationism, Leapfrogging, Technophilia	
Projectionism		Market Fundamentalism
Dualism	Technophobia	Technophobia
Dialectics	Dialectical Integrationism	

Strategy 1: Technological Reductionism 1 (Innovationism): Wait and see, market and technological development will cheapen access

Some say that historically new technologies such as electricity, the car, the telephone, or television have at first always been expensive and reserved to a small elite before they have diffused into society and have become accessible for the broad masses. Concerning the internet the same would be the case and hence one should just wait because after a certain time the digital divide would decline due to declining costs of technology and the effects of Moore's law² (e.g. Compaine, 2001; Norris, 2001). This argument is not suitable for the topic of the global digital divide because the wealth gap between Western and Third World countries is continuously increasing and developing countries are systematically excluded from wealth and technological progress. Hence to wait and see won't solve the problem. Also older technologies such as electricity, the telephone or TV are not widespread in developing countries, there is a general global technological divide.

² Moore's law says that the number of transistors on integrated circuits and hence processing power doubles every 18 months while the costs don't increase.

This strategy can be seen as a form of technological reductionism because it is believed that the digital divide can be solved due to the characteristic feature of computer technology that it develops rapidly.

Strategy 2: Technological Reductionism 2 (Leapfrogging): By entering into markets and competition third world countries will be able leapfrog directly into information societies

Will ICTs help developing countries in leapfrogging certain stages of technological development and the industrial development stage so that they will catch up with Western societies and become information societies? Technological leapfrogging means “the implementation of a new and up-to-date technology in an application area in which at least the previous version of that technology has not been deployed”(Davison et al. 2000: 2). “In developed economies, newer versions of technology are often used to upgrade older versions, but in developing economies where still older versions of technology are often prevalent (if they exist at all), the opportunities for leapfrogging over the successive generations of technology to the most recent version are that much greater” (Davison et al. 2000: 2). Leapfrogging might indeed be possible (e.g. establishing wireless communication in developing countries without requiring the earlier stage of a well-developed wire-line infrastructure), but the important question is not if leapfrogging is possible, but if it will benefit all people or only a tiny class. Market liberalization doesn’t automatically result in the affordability of ICTs for all human beings, hence we doubt that liberalization enables leapfrogging as e.g. argued by Pippa Norris (2001: 42): “Given a high-speed backbone, and market liberalization of telecommunication services, African nations may also be able to ‘leapfrog’ stages of industrialization through new technology by investing in fully digitized telecommunications networks rather than outdated analog-based systems”.

This strategy is also technologically reductionist because here it is argued that computer technologies are so flexible that they allow the instant introduction of the newest standards and that the availability of these standards automatically transforms developing countries into information societies.

Strategy 3: Technological Reductionism 3 (Technophilia): Technologies for the Third World

Jeffrey James (2003) argues that one possibility for solving the global di-

vide is to transport old computers from rich to poor countries. The lifetime of a Western business computer is only 2-3 years, this is due to rapid technological progress and the non-upgradeability of most hardware which causes people to buy new computers every 2 or 3 years as well as heavy profits of the hardware and software industry. The danger in exporting old computers to developing countries is that the latter will become dumps for electronic waste just like many Western corporations and countries consider them as dumps for atomic waste. Besides that we see no reason why developing countries should not have the same right as Western countries to benefit to a full extent from technological progress just like other countries do. Nicholas Negroponte and the One Laptop Per Child (OLPC) association have introduced the \$100 laptop as a strategy for advancing computer technology in developing countries. The problem is that this is a technology that is inferior to Western standards (very slow processor, no hard disk and drives, etc.) and hence can be produced and sold rather cheaply. If the \$100 laptop is widely diffused in the Third World, Western actors selling these computers will derive profits, and a global divide in technological progress and standards will emerge that separates advanced Western technology users from users of less-advanced technologies in the Third World. What is needed are not new business strategies, but solutions to the material and social causes of the global digital divide as well as free advanced hardware, infrastructure, and software that are based on open standards and copy-left licenses. That Microsoft and Intel are critical of the \$100 laptop doesn't mean that it is automatically a good idea; this is rather a manifestation of the competition for profit and customers in developing countries. Open source technologies have a potential to transcend market logic, what is needed is an advanced \$0 laptop with free software for people in developing countries as well as criticism of the capitalist logic that has caused the divide between developing and developed countries and solutions to the social, economic, political, and cultural inequalities that underpin the global digital divide.

Open source software or free software is software that provides four kinds of freedom for the user (Free Software Foundation 1996):

- a) The freedom to run the program, for any purpose.
- b) The freedom to study how the program works, and adapt it to specific

needs. Access to the source code is a precondition for this.

c) The freedom to redistribute copies so that someone can help his neighbour.

d) The freedom to improve the program, and release these improvements to the public, so that the whole community benefits. Again access to the source code is a precondition for this.

Open source software has been realized mainly within projects such as the Linux operating system. Special licences (termed copy-left) such as the GNU-public license have been developed for assuring that free software has an open access to its source code. Free software hardly yields economic profit; it is freely available on the internet and constitutes an alternative model of production that questions proprietary production models. The main reason why free software is a good opportunity for developing countries is not that it is cheap (James 2003), but rather that by using free software developing countries don't depend on Western corporations such as Microsoft which aim not primarily at solving the digital divide, but at accumulating capital in developing regions by creating dependencies on Western technological standards such as Windows. Examples for a large-scale adoption of open source software can be found e.g. in Mexico, China, Zimbabwe, Ethiopia, and Mozambique (Grassmuck 2004: 323-328).

The technophile strategy is a specific form of technological reductionism, it is very optimistic concerning the introduction of new and alternative computer technologies and argues that such technologies should be given to the third world for free or at low costs.

Strategy 4: Economic Projectionism (Market Fundamentalism): Attracting foreign capital will increase wealth for all and access in developing countries

Some stakeholders and scientists argue that liberalizing telecommunications markets in developing countries will attract Western corporations to invest in the ICT sector in these regions and that this will result in economic growth that benefits all and lowers internet and phone prices due to competition (e.g. Murelli 2002). It is naïve to assume that capitalists aim primarily at solving the digital divide, Western investment is only due to the search for new opportunities of expanding capital accumulation. The reality is as that the economic growth caused by Western investments in ICT markets benefits Western corporations and a small local elite, but does not at all assure access

for all to ICTs and benefits from ICTs for all (Fuchs/Horak 2007).

ICT applications in the areas of e-commerce, e-travelling, e-government, e-transport, e-health, e-education, e-learning, etc. are mainly developed in Western countries and benefit under current conditions mainly Western corporations if they are exported to developing countries because these corporations can extract profit by establishing dependencies on Western-defined standards. The Third World is not only largely excluded from wealth, but also from technological progress. In 1999 there was 56 billion dollars in Western foreign aid for the Third World and the latter paid 136 billion dollars debt service to Western countries (Fuchs 2002: 370). Hence in total there was a value transfer from developing countries to developed countries. Although Africans makes up 14,1% of world population, Africa only accounts for 3% of the number of global internet users.

The World Summit on the Information Society (WSIS) sees a sustainable information society as a society in which ICTs promote participation and poverty eradication. For achieving a sustainable information society in developing countries, the WSIS Plan of Action (WSIS 2003) argues on the one hand that debt cancellation is needed, on the other hand that more private national and international markets for ICTs should be provided by developing countries. What is missing here is the insight that markets don't automatically eliminate poverty because they don't determine how wealth is distributed. Hence public institutions and regulatory practices are needed that ensure that all can enjoy the benefits from ICTs and economic production. WSIS sees capital only as a positive factor in achieving sustainable development. It assesses ICT markets as very positive means for advancing social sustainability, it neglects aspects of political regulation of the economy and income distribution, and gives priority to economic logic.

The market-oriented strategy is a form of projectionism, it argues that the solution to the digital divide can be achieved within only one subsystem of society, the economy. Market-driven and profit-oriented development is considered as best practice.

Strategy 5: Dualistic Technophobia: The Third World doesn't need technology

Some analysts argue that there is no need for technology in the Third World because there would be more basic problems such as poverty, health

issues, and illiteracy. E.g. Ted Turner, the founder of CNN, has argued: “We talk about the digital divide. We talk about it all the time at Time-Warner too. We want to get computers in everyone's hands. But half the people in the world don't have electricity. Over a billion don't have access to clean drinking water. Forget the digital divide, they need food, water, clothing, shelter and a chance for an education.”³

Information and communication is just like social security a fundamental human right. This right is explicitly mentioned in article 19 of the Universal Declaration of Human Rights: “Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers”. In information societies opinions are increasingly expressed and articulated with the help of the internet and other new media. Hence material, usage, and skills access to new technologies is a contemporary expression of a fundamental human right. It is unjust that Western citizens enjoy more human rights and economic, social, cultural, and technological resources than citizens in developing countries.

The technophobe strategy is dualistic, it considers technology as completely unimportant, as a mechanism that can under no societal circumstances do any good. Technology and society are completely separated and technology is considered as unimportant.

Strategy 6: Dialectical integrationism: An integrated strategy combining the global redistribution of wealth, educational and health programs, digital literacy programs; public and free access to computers and technologies, open source technologies, and computers for the Third World

All five strategies discussed so far are reductionistic and one-dimensional, they don't see the interconnectedness of technology access, social factors, uneven development, human rights, and global capitalism. In order to tackle the global digital divide a fundamental redistribution of resources is needed as a precondition. Modern society is so rich and productive that it could easily afford a modest income, social security, literacy, and free access to computers and the internet for all humans. If this is a real possibility, then the best and most desirable option is to realize it. But this requires a re-

³ <http://www.geni.org/globalenergy/library/donor-letters/2000/Donor2000-07.shtml>, accessed on October 31st, 2006.

design of global society because the digital divide is not first of all a technological problem, but an economic, social, and political issue. The digital divide is not only a divide in the access to and benefits from technology, but it also an expression of a more general divide in wealth and power. In order to close the global divide first of all measures such as a fundamental global redistribution of wealth, a full cancellation of all debts of development countries, a multiplication of development aid, the provision of free public health and educational programs, and a basic income guarantee for all absolutely poor individuals (that could be financed e.g. by a Tobin tax) could be realized. Based on such a material foundation further measures such as the support of publicly provided free access to computers and internet for all, the public provision of digital literacy programs, local hardware production that aims at free or cheap local products and the large-scale adoption and production of free software-technologies (that are adapted to local needs) by developing countries seem to be feasible. Western actors or countries could also provide computers and equipment for free to the Third World, but these technologies should be technologically advanced, non-commercial, non-proprietary, free of cost, and open source in order to avoid the deepening of existing or emergence of new dependencies. Access to technologies should be universal, guaranteed by the public, free of cost, and based on open source. That it should be universal means that it should be guaranteed to all people. This can best be achieved if provided not by private organizations, but by public ones (such as communities) because the latter are not based on profit interests that might undermine universality, but on the common interest in common goods. The best guarantee for avoiding the emergence of capitalist interests in technology that might undermine universal access and the dependency of developing countries on Western capital, technologies, and interests, is the provision and development of technologies that are free of cost ("free access for all") and open source (accessible source code in order to advance co-operative engineering, high quality, and free access). Open source technologies can advance the emergence of local and regional communities for co-operative technology development that act independently from Western interests and the logic of profitability.

One innovative measure is to establish public funds for free access telecommunication services. In Brazil the Partido dos Trabalhadores (PT) gov-

ernment has established a fund for universal telecommunications services (FUST) financed in part by a one per cent tax on the gross revenues of telecommunications service providers. It provides ICT resources for schools, health facilities, and rural communities. Such funds can be financed as the Brazilian example shows by taxing capital and/or by development aid. An integrative strategy of fundamental redistribution mechanisms, free public access, educational and health programs, a gift economy, open source and open access technologies seems most promising to us. One-dimensional strategies ignore the interconnectedness of technological and societal issues. For overcoming the digital divide more fundamental strategies that aim at changing society and departing from the dominance of capitalist logic are needed.

The strategy of dialectical integrationism integrates societal and political measures in the areas of poverty reduction, development aid, debt service, health, or education, with the introduction of alternative technologies that can support local societal development and are in line with local knowledge and needs. This strategy is not one-sided and much more complex and realistic than the other five.

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