Myths of digital technology in Africa : Leapfrogging development?

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FROM NWICO TO WSIS

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ABSTRACT

Many multi- and bilateral agencies have integrated the promotion of information and communication technologies in Africa into their programmes. Along with African NGOs, they strongly advocate the use of ICTs by government offices, private enterprises, schools and the public. In general, groups and actors involved in such efforts share a set of dispositions and worldviews which are highly 'modernist' and technocentrist and characterized by a propensity to view and act in favour of exogenous 'technological' solutions to development problems. One of the main characteristics of this rhetoric is that it accords no importance to existing social conditions, assuming that equipping people with computers will suffice to leapfrog them into the technological world of economic opportunities. This article critically reviews the main ideas presented by the proponents of this position in Africa and shows why there is a need for a more cautious approach to the question, without rejecting the promises of ICTs.

KEY WORDS

access ■ Africa ■ democracy ■ ICTs ■ internet ■ WSIS

Introduction

In a few months the World Summit on the Information Society (WSIS) will be held in Tunis.[1] Africa will be represented at all levels by political actors as well as NGO representatives and international development agencies operating on the continent. In preparation for the WSIS, Ghana hosted a meeting in February 2005, during which the participants tried to build a consensus on an African agenda for a full integration of the region's countries into 'the global village'. For a number of these participants, the Information Society is unquestionably perceived as a chance for Africa, a chance to blend into a world of economic opportunities and social well-being. They think that information and communication

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technologies (ICTs) are the instruments through which the growing marginalization of Africa can be tackled. These expectations and assumptions are now pervasive in the development literature (Menou, 1999).

However, it is not the first time that grandiose hopes of leapfrogging development have been attached to a new technology. Since the end of colonialism, nearly every decade has been marked by the celebration of a new technology as a means for overcoming the long-lasting problems faced by developing countries. The era of tractors[2] was replaced by the era of broadcasting and television,[3] and the latter by the era of new information and communication technologies (ICTs). Many authors (Castells, 1997, 1998, 2000; Mansell, 1993; Mansell and When, 1998; Negroponte, 1996) compared the unprecedented development of ICTs to changes brought about by the printing machines or the invention of writing. They particularly emphasized the potential for well-being, education, and liberty offered by these technologies. They are backed by international development agencies such as the UNDP (United Nations Development Programme, 2001) and the World Bank (through its Global Information and Communication Technology Department),[4] which argue that the need exists for developing countries to implement national ICT strategies to help them build 'knowledge societies' and foster development. They contend that Southern countries should participate in the globalization process of the information age to fully share its benefits.

Outside of the academy and in developing countries, there is also a growing literature devoted to the evaluation of ICT projects and programmes.[5] This literature is based on the assumption that economic development can be fostered by the use of ICTs[6] or the assumption that they can foster the direct participation of people in political decisions (Grossman, 1995; Ott, 1998). In the same way, the problems of culture and identity, modernization and globalization are analysed in their relation to development and technological change (Appadurai, 1991, 1996, 2001; Escobar, 1994; Pfaffenberger, 1992). However, the optimism which often marks some of these views is not sustained by clear evidence when it comes to how these technologies will perform the miracle.[7] What we are offered as arguments is constituted by a set of general statements and enthusiastic accounts of the potential change ICTs might generate.

The perceived benefits of ICTs

ICTs are first believed to be media through which intellectual content is developed, information circulated, and ideas and objects exchanged, which all contribute to creating wealth and empowering community members.[8] It is affirmed that rural communities (traders, craftsmen, herdsmen, etc.) can thus find the way to advertise and sell their products all over the world and particularly to people of industrialized countries. It is also said that teachers and students can improve their performance by using resources (books, exercises, learning materials, etc.) available through the web; in the same way, civil society (NGOs, workers' unions, women's groups, associations for people with disabilities, minorities activists, human-rights activists, etc.) can advocate democracy and progress (Grossman, 1995; Ott, 1998); women and children can find new perspectives when faced with the day-to-day burden of male domination or abandonment (Rathberger and Adera, 2000); artists can find new ways of expression and communicate their feelings to those who are interested (African Studies Association, 2002); entrepreneurs can expand their markets and production; researchers, through networks, exchanges and newly available resources, can improve their searches, economize time and money, and collaborate with other researchers throughout the world; and so forth (African Development Forum, 1999a,b,c,d,e).

As stated by Bedi, 'Proponents attribute a wide and almost impossible array of positive effects to ICTs' (1999: 10). These include economic growth, agricultural and industrial productivity, efficiency of public administration, and participation in democracy. In any case, the potential for development is unquestioned and the emphasis is put on 'holistic' aspects (Hawkins and Valentin, 1997: 8). The benefits of the 'information age' 'are often held to be true axiomatically' (Bedi, 1999: 10). This discourse has had profound policy implications for international development agencies and developing countries. For example, in 1996 the United Nations Economic Commission for Africa launched what it called the *African Information Society Initiative* (AISI, 2003). AISI has been conceived as 'an action framework' which is 'the basis for information and communication activities in Africa' (AISI, 2003). All African countries have endorsed this programme of activities. In 1999, AISI held the African Development Forum in Addis Ababa with the theme 'The Challenge to Africa of Globalization and the Information Age'. This forum set as goals, through the use of ICTs, the eradication of poverty, the promotion of democracy ('electronic government'), education,

health care, business and trade. It also published four theme papers which are the theoretical basis for ICT policies in Africa:

1. Globalization and the Information Economy: Challenges and Opportunities for Africa
2. Information and Communication Technologies for Improved Governance in Africa
3. Strengthening Africa's Information Infrastructure
4. Democratizing Access to the Information Society (ADF).

Following this forum, a wide range of literature flourished that established the rationale for development interventions in the domain of ICTs. In the following pages, I will analyse how these four areas of interest (access; content and language; identity and culture; and implications for democracy) are defined in the literature.

The access issue

The problem of access amounts to the ways African populations might be equipped and trained to use information technology. However, access also has to do with what is called the 'digital divide', in other words, the inequality between developed and developing countries regarding access to information technologies. In the same way, the inequality between social groups and between males and females parallels the differences between the 'haves' and 'have-nots' (those who can afford computers, for example, as opposed to those who cannot), and between literate and illiterate people (those who can read the English content of the internet, for example, as opposed to those who cannot), etc. Access has been the most debated topic when it comes to the relationship between ICTs and development in Africa. Of course, the first obstacle identified by researchers is the enormous gap existing between African countries and the developed world.

Jensen, in 'The African Internet – A Status Report' (2002), estimates that internet users in Africa amount to:

> 5–8 million, with about 1.5–2.5 million outside of North and South Africa. This is about 1 user for every 250–400 people, compared to a world average of about 1 user for every 15 people, and a North American and European average of about 1 in every 2 people. (2002: 1)

Castells, on his part, writes: 'There are more telephone lines in Manhattan or in Tokyo than in the whole of Sub-Saharan Africa' (1998: 92). As for Mansell and When (1998) they assert that 'for many of these countries

widespread access to these technologies in the timeframe within which policy and strategic actions are taken [is] out of the question' (1998: 100). This is the crudest manifestation of the digital divide. It is due, above all, to the extreme poverty of many African countries.

However, none of these authors has apparently anticipated the rather extraordinary development of new ICTs in just the first four years of the 21st century, notably the fact that innovations are lowering the cost of technological devices and expanding their penetration in developing countries at an unprecedented pace. We can even say that it is becoming more and more difficult to distinguish info-poor countries from info-rich countries. Not long ago, the Senegalese president, Abdoulaye Wade, echoed Castells' notion that there were more telephone lines in Manhattan than in all of Africa. He thought he was just voicing a striking opinion, usually made to illustrate the info-gap between poor and rich countries. However, he was not aware that things have changed radically, thanks to Africans' rapid adoption of the internet and cell phones. He was corrected by a World Bank report, which notes: 'Unless New Yorkers and their commuter friends have 12 phones each, Africa now has many more telephones than Manhattan' (ABCNews Online, 2005). Indeed, due to the very rapid expansion of ICTs and particularly cell phones, the gap between Africa and the rest of the world, although still very large, is being reduced.

According to the International Telecommunication Union (ITU), Africa is now 'the world's fastest growing mobile market' (2005: 1). Between 1998 and 2003, the increase of subscriptions to mobile phones outpaced by 1,000 percent those of fixed lines. More than 51.8 million people in Africa have cell phones (and this figure is expected to be 90 million in 2005) while only 25.1 million own fixed lines. ITU's report affirms also that cell-phone penetration in Africa extended to 6.2 per 100 inhabitants by the end of 2003 while fixed-line penetration stood only at 3 per 100 inhabitants. By 2003, almost 70 percent of telephone subscribers in Africa were using cell phones. In sub-Saharan Africa, especially, three out of four subscriptions were by cell-phone users: 'This is the highest ratio of mobile to total telephone subscribers of any region in the world', the report states (ITU, 2004: 1). The annual average growth rate of cell-phone use in Africa is 65 percent, compared with 33 percent for the rest of the world.

Notwithstanding these developments, Africans are far from bridging the digital divide because it is not only a gap between countries, it is also a gap inside countries, with disparities existing between rural and urban settings, men and women, and the educated and uneducated.

Infrastructure is mostly implemented in modern cities, particularly in the capitals. Expanding ICTs to rural communities is particularly challenging because of lack of energy (electricity) and problems related to language, illiteracy, etc. States are poor and cannot support a large expansion in rural sectors. That is why alternative solutions, such as solar energy, are being attempted to create rural connectivity. The goal is not to reach a level of access such that one person could have simultaneous telephone and internet access but rather to promote collective models of access such as telecenters (equipment set up to deliver multiple services – access to the internet, phone, fax, etc.) or cybercafés, which have been implemented with the help of some organizations in countries such as Mozambique, Kenya, Uganda, Senegal, Mali, Benin, South Africa, etc. (Etta and Parvyn-Wamahiu, 2004).

In the current literature, cybercafés and telecenters in Africa have been analysed mainly with regard to their function of providing access to computers and telephones. However, here again, the question of access cannot be reduced to the number of computers or telephone lines in a country. The skills needed to run the equipment and to interpret and apply the information retrieved are equally important: as Mansell and When write, 'the capacity to generate, distribute, and share information about local resources and activities is as important as access to distant digital information' (1998: 100).

Content and the language issue

Another of the main issues posed by the reception of ICTs in Africa is the question of content or technology-generated knowledge. Since this content is generated in the West, will Africans be passive 'receptors' and 'consumers' in the chain of information? How can they be potential creators or contributors? How could they appropriate this knowledge and preserve and produce, in turn, their own knowledge? Will their identity face negation and marginalization, or will they be able to maintain old identities and create and manage new ones?

Closely linked to these questions is the perceived 'threat' posed by the consumption of foreign intellectual production and cultural values (Bosah, 2000). More importantly, ICTs themselves are based on some epistemological assumptions, which constitute their core values and which could contrast with some cultural values or identities and representations in Africa. We have only to think about how cultural identities and representations have been influenced by the introduction of movies, radio, and television. The way identity is structured may also be

affected by newer ICTs because individuals have to think about themselves and to define themselves in new ways. Some representations may be reinforced while others may be diluted (Lengel and Murphy, 2000).

This contrasts with the idea of ICTs as tools of liberation, since local values and endogenous development could be undermined by foreign interests and models of consumption imposed from the outside (Gunkel, 2000). Thus, people may lose control of their destiny and decisions, which can profoundly affect their lives. These concerns are expressed in most of the literature devoted to the issue of content. Solutions identified by the various authors are generally related to the production of local knowledge. For example, in a report titled 'Using ICTs to Generate Development Content', Batchelor writes that 'this foreign content must be matched by the expression and communication of local knowledge that is relevant to local situations' (2002: 4). In other words, ICTs should be used to process and transmit locally produced content. They also should help local people interact in their own cultures, through their own languages.

In this context, the issue of language takes on particular importance since English and European languages largely dominate as internet languages (Gunkel, 2000). Thus, the problem of access linked to illiteracy is doubled by the use of foreign languages. This can make impossible or at least very difficult the appropriation of these technologies as regards the creation of indigenous knowledge. A large part of the literature on this topic (mainly in the form of conference reports) is focused on the use of African languages or the use of alternative solutions; for example, technologies which do not require literacy. The Regional Conference of Africa, held in Bamako in May 2002, insisted in its conclusions on the need for Africa to address the economic, technological and political aspects of the use of African languages on the internet (production and maintenance of websites in African languages, training of African data-processing specialists, etc.). In this context, software in African languages, automatic-translation software, online dictionaries for African languages, African-language tablets and graphics, and multilingual internet names have been created and are managed by dozens of projects.

African languages are judged important in the pedagogical process also because ICTs are becoming more and more used in distance-learning courses through projects which seek to link African universities, teachers, researchers and students to Western universities and research centres. The original aspects of these technologies are that they make interactivity possible in the pedagogical relation. The participants are

understood as 'a conversational learning community' (Bodomo, 2001: 1) and thus the use of indigenous languages becomes one of the salient aspects of the learning process. However, the idea of 'local knowledge' has itself to be calibrated with local realities, namely the fact that local expressions of culture are not always 'authentic'. Local Westernized elites are usually the ones with access to computers. It is not automatically the case that they articulate local cultures since they have been educated in foreign languages and have, in line with their social position, specific interests. They share worldviews and ideologies which are often in accordance with techno-centrist ideas, and they may advocate the use of information technologies in order to reinforce their position in society.

Identity, culture, gender and cyberspace

Although scholars have rarely so far addressed the potential implications of ICT use on African cultures and identities, a growing literature dealing with cyberspace and cyber-identities (understood as global realities) exists today. Two orientations can be distinguished in this literature: one which deals with the interaction between ICTs and the internal structures of society, its divisions; and one in which cyberspace is viewed as a land of no-conflict, where social struggles and competing worldviews are reconciled.

In the first group, we find authors such as Castells (1997), for whom technology is a symbol and a powerful means of domination for ruling elites and societies. It participates in the perpetuation of power and authority and becomes central to negotiating identities and social conflicts. Identities can be affected by the use of ICTs because individuals have to think about themselves and define themselves in new ways. New lines of division are even being created in the use of, or, more precisely, the access to ICTs. Thus, for Castells, the advent of informational/global capitalism is concomitant with a 'dehumanization', a 'marginalization' or a 'selective integration' and a 'technological apartheid' for Africa (1998: 82–92).

Hall (1998) has analysed 'the digital divide' (the inequality in the access to computers and the internet) as a mark of status which the African elites are trying to monopolize even though they face a contradictory process: due to the drastic fall in prices of services and devices, these new technologies are becoming more affordable. Besides, some rural communities are gaining access because of technical innovations and international programmes and projects aimed at 'decentralizing'

and implementing them in the remote areas. The content of the information circulating is also subject to this kind of 'democratization'. What Hall's study suggests is that privileges and positions may be capable of being undermined by the use of the internet in Africa. However, this idea is arguably part of the current 'technotopia' (Hakken, 1999) which accords to computers the capacity to change social relations. On the contrary, it is not the technology that shapes social structures but rather social structures and 'external' conditions of existence, such as they are lived daily, that shape interactions in the virtual world. In the same way, the structure of interactions between internet users is determined by the position they occupy in the real world.

Thus, in Africa and elsewhere, there exists a strong correlation between gender and internet use, this being partly the result of females' low access to education in developing countries. For example, until recently, the necessity for girls to go to school was hardly admitted by most Nigerien parents. In a survey designed to assess Nigerien parents' perception of girls' and boys' schooling (*Niger Multiple Indicators Cluster Survey*, UNICEF, 1996), 27.1 percent of parents responded 'No' to the question: 'Is it necessary for girls to go to school?', while the proportion was only 6.2 percent when it came to boys. It appeared even that mothers perceived less than fathers the necessity for girls to go to school: 28.9 percent of them responded 'No' against 24.7 percent for fathers. Here again, education appears as a strong discriminating factor, since there were more educated parents perceiving the necessity for their daughters to go to school than uneducated parents: 31.7 percent against 25.2 percent. This also explains why girls and women are underrepresented among internet users in Niger, and Africa in general. This under-representation is the result of dispositions cultivated in relation to women's uses of technology. As shown by many studies, family socialization of girls and women influences attitudes towards education as well as towards computers and internet use (Rajagopal and Bojin, 2003).

In the African context, the gendered dimension of technology is rarely admitted, particularly by development agents. On the contrary, we are invited to share the view that technology is neutral and constitutes a kind of independent domain, which has its own life, detached from society and social stakes. In this view, social divisions, categories and identities seem to play no role in the introduction, reception and appropriation of technology. The powerful symbolic values carried by technologies find no place in the design of the devices. However, it is not difficult to see that the dominant view is in reality the

idea that technology is a 'male device' and this, of course, induces 'fears' on the part of women wishing to use technology (Rathberger and Adera, 2000). Thus male dominance in the social and economic sphere is transferred into the sphere of technologies, contributing to marginalize women as active participants in development. In turn, poor access to ICTs isolates women from sources of information which could be helpful to them. It means isolation from skills, knowledge, ideas, new perspectives which can lead to integration into the modern world. It results in the fact that women's specific needs and views about technology are not taken into account and this in turn has an impact on women's access and use of technology.

ICTs and democracy in Africa

In *The Electronic Republic: Reshaping Democracy in the Information Age* Grossman (1995) argues that new ICTs are fostering direct participation of people in political decision-making. Their main effect has been to make possible the rise, visibility and weight of public opinion as a way of orienting and influencing the political process. Thus, elites are more and more concerned and bound by public opinion and try to frame their actions around it, making possible the advent of 'popular consensus' and what he calls 'the electronic republic'. Following Grossman's study, many authors have seen in information technologies a way to promote democratic governance, and cultural and political resistance against dictatorial control in African countries. Thus, in a paper titled 'Power to the People: The Role of Electronic Media in Promoting Democracy in Africa', Ott (1998) notes that we have passed from a 'polis' in which 'direct communication among and between all the political actors was an attainable ideal', to a situation in which diversity and geographical distance necessitate 'alternative modes of interaction' (1998: 1–2). From this perspective, access to ICTs can foster the democratic process in Africa.

The internet can also play a unifying role for diasporic communities. It can loosen the class, gender and intellectual barriers which used to divide them. Today, this is true for many scattered peoples who find in the internet a way to regain a sense of lost community, according to Maybury-Lewis (1998). The flexibility of the internet makes possible a greater number of positive expressions of individual or collective identities. Indigenous social movements such as the Zapatistas find in the internet a powerful tool for breaking their isolation and promoting their struggle across the world (Castells, 1997).

Along these lines, the critics focused on the centralized and authoritarian role of African governments, particularly in French-speaking authoritarian states which do not allow for the emergence and expression of local power. Rural populations and women particularly are dispossessed from any participation in power and the resources power offers. Therefore, the advent of ICTs is understood as an opportunity for shifting and sharing power until now concentrated in the hands of the urban political authoritarian elite. The decentralization issue, or how to empower rural and poor people through the use of information technologies, then becomes central.

For Fleming (2002), the primary role of ICTs in promoting democracy in Africa is in 'facilitating participation and providing public access to information' (2002: 1). Advocacy and empowerment of civil society are therefore the most important aspects of political activism that the internet could help foster because the most significant obstacles to democracy are the exclusion of the poor, the social and intellectual distances between decision makers and rural people, etc. Thus the democratic potential the internet may offer is seriously impeded by social inequalities.

Similar observations made everywhere in Africa led to the adoption of the concept of E-Governance (Electronic Governance), defined as the delivery of government services and information for public usage in order to empower communities so that they can take part in the management of their own affairs, in their own interests and in the interest of the wider society.

Information technologies are claimed to ensure a more transparent process as well as the availability and the dissemination of the information necessary for this participation.

However, E-Governance is not intended for the administered only but is intended for governments as well. It is believed that electronic tools could be used for the improvement of communication among administrative services, among citizens and governments and among businesses, thus creating 'vast economic opportunities for African countries', as explained in the 'e-Africa 2002: Building e-Governance Capacity in African Countries' project proposal (ATRCAD, 2002: 3). In the context of the same framework the United Nations initiated UNPAN (2002) (the United Nations Public Administration online Network) whose aim is to improve governance and management in Africa by promoting community multipurpose telecenters and rural radio stations. For its part, in 2003, the USAID (United States Agency for International Development) launched the Digital Freedom Initiative in Senegal in order to promote the use of ICTs in Africa through the creation of new enterprises.

African elites, ICTs and the rhetoric of development

According to Grant Lewis (1992), the current discourse on ICTs and development is often an outcome of the ideology of a professional elite, interested in controlling rewards associated with the use of computers and the internet in Africa. Although members of this elite claim to serve only popular interests and technological development, it is not difficult to see that they are, above all, interested in becoming a visible group of professionals, in gaining a status and participating in the formulation of national ICT policies. Advancing internet use in their respective countries would increase their prestige in the wider society as highly skilled professionals able to master the most advanced forms of contemporary technologies. In turn, their visibility would result in more influence on national ICT policies, more foreign assistance, more ICT programmes and projects, and more rewards for them in terms of employment, consultancies and NGO creation. In other words, the current discourse on ICTs is strongly associated with specific social positions and interests. It is a legitimizing discourse for national groups of professionals and foreign aid agencies which share common interests in the promotion of ICTs and whose worldviews are re-appropriated by ordinary internet users.

Thus, we should not reduce technical issues, and particularly internet issues, to solely the technical sphere. As a technology, the internet operates within a set of social conditions which give it meaning and value. The images of the internet in Africa are constructed through a discourse which reflects the ideology of developmentalism and the interests of particular groups of actors, even though it is based on technological determinism. These groups of actors are what Uimonen (2003) calls 'the Internet community'.

Based on shared interest rather than physical proximity, the internet community is above all a *community of interest* (Rheingold, 1994), a transnational community that cuts across organizational, national and continental boundaries. This community is but one example of transnational social landscapes, what could be defined as *netscapes* (Uimonen, 2003) that frame online social interactions. These instances of global cultural flow combine a localized sense of belonging with a global, cosmopolitan outlook (Uimonen, 2003:146).

Therefore we should look behind the screen, where real actors with real interests engage in 'socially anchored practices' (Uimonen, 2003), along with the elaboration of a corresponding ideology. Above all, internet promoters tend to be among the young, educated elite, who, by

virtue of their training and profession, share an interest in wide use of the internet. Their daily activities are closely related to computers and the internet, and their professional ethos, as well as their culture, involves 'networking'. They are concerned with knowledge sharing and information sharing, as well as facilitating or providing access to the internet. They take part in 'virtual' groups of all sorts, such as online discussion groups, international or global associations, and organizations promoting computers and the internet, numerous colloquia, conferences and training seminars helping them keep updated about the latest advances in information technology.

They subscribe to journals devoted to the popularization of ICTs and read online e-news and bulletins. But, more importantly, they are connected to each other and to other interested people around the world by way of new communication technologies, most commonly through e-mail. They can best be described as people having their feet on the African soil and their heads in the virtual world of interconnectivity. Because they share an interest in the advent of a world that is in accordance with their social dispositions and their expectations, their discourse is a 'performative discourse', in the sense that Bourdieu (1990) gives to this term, namely, a discourse which calls into being the reality it evokes. It is a kind of social movement that, says Uimonen, 'is aimed at transforming meaning ... [It] is also characterized by the "outward-oriented missionizing" that characterizes movements, in this case a pronounced desire to extend the Internet and the spirit in which it has been developed around the world' (2003: 154).

More importantly, the techno-centrist discourse on ICTs and development is deeply rooted in philosophical and moral concepts which shaped the relations between colonial Europe and Africa. Under one form or another, it marks and sustains the discourse on ICTs in all its aspects. It derives from the 19th century's idea that technological progress will ultimately free people from all natural and social constraints.

Conclusion

Against this utopia, we should not forget that whatever the technology, its use is shaped by 'external' social conditions. It does not derive from an 'internal' logic commanded by the way the technology has been designed. In other words, the general conditions in which people are living do not change suddenly with the introduction of the internet. Those who are poor and illiterate remain so. ICTs cannot leapfrog beyond the ordinary development problems Africans are faced with.

Introducing computers in rural areas, for example, does not automatically solve the problem of illiteracy, health-related problems or poverty. The solutions to these problems reside outside of the realm of technology. It is important to remind ourselves that there is a digital divide *within* societies, an inequality of access to computers and other technologies. Technological opportunities are unevenly distributed, particularly in African nations, where a small elite holds power, economic resources, and knowledge. Members of this elite are in a position to consolidate its resources and its power in a society where technical skills and access to technology are important facilitators of success. Unskilled people who are deprived of technological means are at risk of being marginalized. Thus, instead of being a tool for liberation, the internet can become an intimidating technology which can contribute to widening the gap between those who possess everything and those who do not. They can become a tool for excluding poor and illiterate people.

Notes

1 The World Summit on the Information Society took place in Tunis from 16–18 November 2005. This article was submitted to the editor before that date.
2 I am here referring to the 1960s theories of the 'take-off' (Rostow, 1960), which closely linked the improvement of agricultural production to massive introduction of tractors in Third World nations.
3 In the 1970s, programmes of 'educative television' were introduced in many African countries. They were supposed to rapidly raise the schooling rate by lowering education costs since fewer teachers and didactic materials would be needed to teach a greater number of pupils. These programmes failed and a country such as Niger, where they were first introduced, still has a schooling rate of less than 40 percent.
4 On its website, the World Bank presents the mission of the GICT (Global Information and Communications Technology Department) as follows: 'Information and communication technologies are opening new opportunities for emerging markets. The World Bank Group aims to stimulate sustainable economic growth, increase productivity, improve public services, promote transparency, and reduce poverty through extending the reach of these technologies in the developing world' (World Bank, 2002).
5 Mike Jensen (2004) has compiled an impressive list of these programmes and projects in an online document.
6 We find one of the first formulations of these ideas in ITU's 1985 'Report of the Independent Commission for World-Wide Telecommunications Development' (The Maitland Report): 'Decisions by telecommunications operators in developing countries to improve and expand their networks will create a major market for the owners of telecommunications technology, and the manufacturers of equipment. A more comprehensive world system will mean an increase in international traffic from which all operators will benefit. Where information flows so does commerce.

A growth in world trade and other contacts will increase understanding among peoples. Effective and expanded telecommunications both within and between countries will make the world a better and safer place' (p. 4).

7 The goal of most of those projects and programmes is to bridge what came to be known as the 'digital divide', the inequality of access to computers and the internet (Hall, 1998). Like many terms or concepts in vogue in developing countries and Africa, the idea of 'digital divide' finds its origins in Western preoccupations and debates, notably the mid-1990s debate on 'technology poor and technology rich' in America. Larry Irving, a former member of the Clinton administration, is said to have coined the term 'the digital divide' and informed 'the American public about the growing problem it represents' (Morino Institute, 2004). However, Larry Irving himself, in an online discussion forum, accords the paternity of the term to two *Los Angeles Times* journalists. He writes: 'Jonathan Webber of the *Industry Standard* makes a compelling case that somewhere back around 1995 he and Amy Harmon (when both were with the LA Times) invented the term to describe the social division between those who were very involved in technology and those who were not' (Irving, 2001).

8 It should be noted that I am not implying that tractors and other technologies are not indispensable to development. I refute any kind of primitivist theory or techno-pessimism. However, I think that technologies should be placed in context, as only one of the dimensions of development. The social and political dimensions are as important as technology is and that is why the latter should not be isolated and fetishized as if it were able to produce a miracle by itself without the social and cultural aspects which give it its meaning.

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