

On the ambivalence of information and communication technologies

Peter Fleissner

The diffusion of digital information and communication technology (DICT) is strongly supported by many countries of the world. Today, as well as in the past, new technologies are charged with high expectations, but at a closer look, one can see that the expectations then are very different from now. Today, they depend on the various interests of different groups of people. Globally acting enterprises see DICT as essential strategic instruments in gaining competitive power; some governments hope to reach military hegemony with them, others to control terrorism and crime, while grassroots movements expect to become more influential on some aspects of society. This chapter identifies and analyses basic tendencies that promote the various hopes: the effects of DICT on reducing production and transaction costs, and the possibility of transforming information goods into marketable services or commodities. The final part of the chapter is devoted to a few examples of how the potential of DICT can be used for social improvements.

Contents

Introduction	146
Basic techno-economic and legal trends of the information society	146
Contradictory effects of commercialisation and commodification	149
Growing resistance	150
DICT-assisted “joy of sharing knowledge”?	150

Author’s details

Prof. Dr Peter Fleissner

TU Wien, Favoritenstrasse 9/187.2 A-1040 Vienna, Austria

☎ + 43 – 1 – 504 11 90

✉ fleissner@arrakis.es

🌐 www.arrakis.es/~fleissner

Introduction

The emerging information society, politically supported by the United States, the European Union and many other countries, is charged with high expectations. Such optimism is far from being a new phenomenon in history. Chappe's optical telegraph in the French Revolution (Flichy, 1994:21ff), Henry Ford's assembly lines (Gramsci, 2004:303) and Lenin's statement in 1920: "Communism – that is Soviet power and electrification of the whole country" (Lenin, 1962:483–515), are prominent examples of technologies related to social improvements of one or another kind. Upon looking closer, however, one can see that the content of expectations is very different, depending on the various groups involved.

To exploit the full social potential of digital information and communication technology (DICT), it seems useful to analyse the basic economic tendencies that accompany them, particularly within the context of the African continent. The reason for this is that most relevant ethical decisions that could improve the socioeconomic situation of disadvantaged groups will not go very far without a sound techno-economic base. Even though this condition is a necessity, in and of itself it is not sufficient for success, as favourable political and institutional conditions have to support the momentum. Therefore, the research method chosen here as appropriate is a combination of political economics and political philosophy.

Basic techno-economic and legal trends of the information society

Technically speaking, the development of the information society is deeply rooted in two basic technologies: the Internet and wireless communication. While the basic intention of the Internet was to survive a nuclear attack by the decentralisation of nodes and to avoid combat damage by compromising the entire network, research institutions embraced the concept during its second stage. In the 1990s, it gained new momentum and popularity after Tim Berners-Lee's creation of HTML, HTTP and the first webpages at CERN, Geneva. In 2007, Internet usage statistics indicate approximately 1.1 billion users worldwide (i.e. 16.9% of the world's population), with around 33 million users in

Africa. The latter corresponds to a penetration rate of 3% and represents the highest growth of usage worldwide, namely 30.3% per year between 2000 and 2007 (Internet World Stats, n.d.). The annual growth of 23.7% between 2000 and 2004 of mobile communication subscribers in South Africa is also remarkably high (UN, n.d.). The increased diffusion of these two kinds of DICT amplifies certain essential economic effects: falling transaction costs, increased commodification of information goods, and commercialisation of communication.

Falling transaction costs

Although there are various definitions of transaction costs, their common denominator can be understood as the costs of making an economic transaction and/or the indirect production expenses, not including the direct production costs of material, energy and labour. In a broader interpretation, one can see them as all costs of information, communication, organisation, administration, coordination, negotiation and motivation. They are related not only to financial costs, but also to labour time or other efforts needed for improving the quality of a product or service. Although critics state that DICT could contribute to information overload and create other negative phenomena, it is evident that the use of DICT has great potential to reduce transaction costs. The trend of falling transaction costs is closely linked to decreasing production costs of the basic active element of electronic technology: the transistor. Within two years (or even less) the costs to produce a transistor has been reduced by a factor of two. At the same time, the size of transistors has shrunk considerably (see Figures 1 and 2).

From the point of view of an enterprise this means that the application of DICT will increase profits or the profitability of an investment. However, there is more than just cost reduction. Economists of the institutional schools have proven that the potential set of players to perform productive activities can change. Williamson (1985) gives a classic example, namely the end of the "putting-out-Systems" and the birth of the "factory-Systems" in Great Britain in early capitalism. Small or medium-sized enterprises (SMEs) formerly bound to local markets can now become global actors because of DICT.

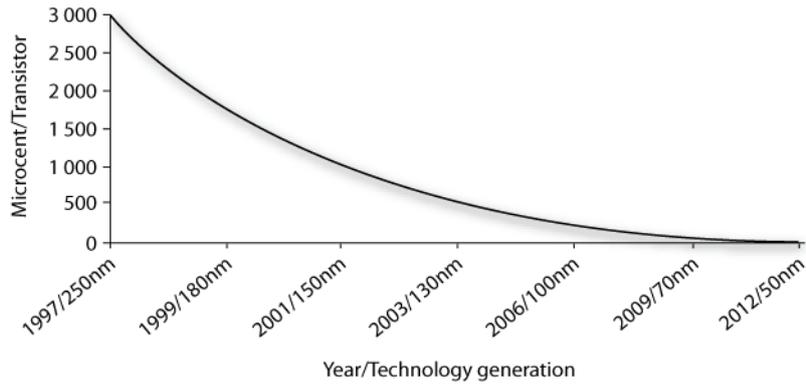


Figure 1: Falling costs per transistor

Source: www.micromagazine.com/archive/98/03/9803m 51b.gif

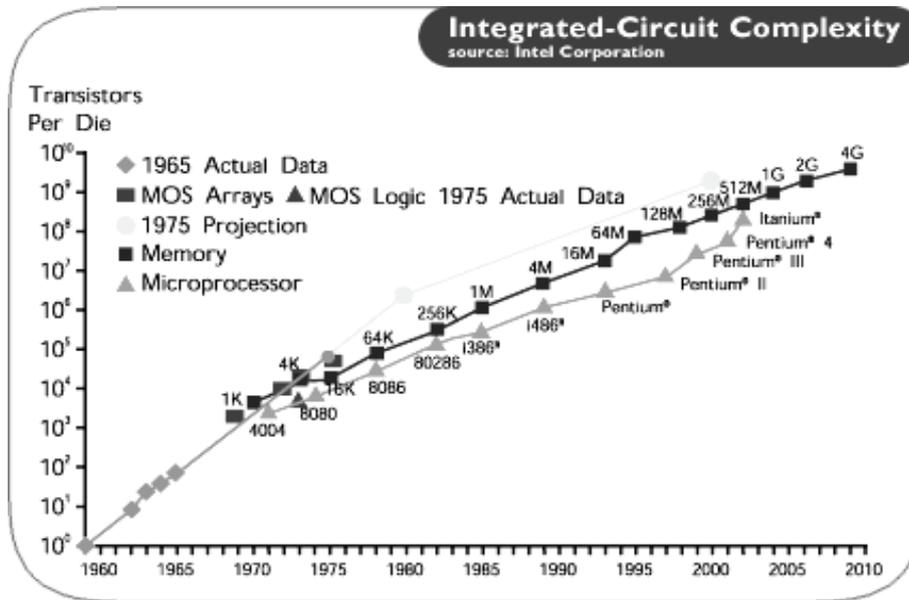


Figure 2: Increasing number of transistors per die

Source: http://www.research.philips.com/password/archive/16/images/PW16_moore-1.gif

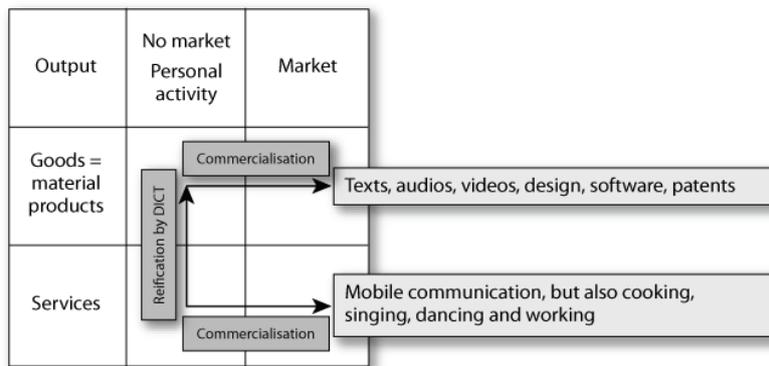


Figure 3: Commercialisation and commodification in the information society

Technology can empower new individuals, groups or organisations to perform new activities, but can also bring traditional players under pressure.

Commercialisation and commodification

There is a growing tendency of the market to cover new fields of human activity (information, communication, knowledge, and other cultural acts) and to transform them into commodities. Let us take a closer look at the mechanism behind this socio-technological process. To understand the notion “commodity” which is used here, a small excursion into the basics of political economics is needed.

Since Aristotle – Adam Smith (1776) and Karl Marx (1962) continued this tradition – we know that a commodity shows two essential properties: it has *value in use* (a thing is useful for somebody for any reason) and it has *value in exchange* (a thing has a value for other people than the producer, who pay for it in the market).

*The one is peculiar to the object as such, the other is not, as a sandal which may be worn, and is also exchangeable. Both are uses of the sandal, for even he who exchanges the sandal for the money or food he is in want of, makes use of the sandal as a sandal. But not in its natural way. For it has not been made for the sake of being exchanged.*¹

But what about human activities that will not result in a physical product? Can they be called commodities? In the language of economists, these human activities function under the term “services”. They disappear after production and are at the same moment consumed. There is a problem with live human activities if they should be sold on the market. They can be sold only once, they are volatile and can neither be stored nor accumulated. A large part of human activities consists in live acts – speaking, singing, dancing, writing, creating poetry, researching, programming, etc. They represent “pure” use values. Many acts of human culture are of this kind.

¹ Aristoteles, *De Republic*, I. i. c. 9. See also <http://www.econlib.org/library/YPDBooks/Marx/mrxCpANotes.html>, footnote 47.

Contribution of DICT to commercialisation

DICT can have two major effects on volatile human activities. The first one is related to space. By means of electronic devices all kinds of information can be transferred from one place to another. It is the essence of a well-known quote describing the effects of the information society: “The world has become smaller”. We all are confronted with a changed topology of physical space because of the possibilities of electronic transfer of information. Of course, we have experienced a predecessor of this effect in fixed-line telephony. Now, however, the possibilities of cellular phones and the Internet have “extended” the range of shrinking space much more and have transformed personal communication and private talk into a commercialised service one has to pay for. New markets have been opened up, which have become very profitable beyond the borders of Europe.

Contribution of DICT to commodification

The second effect is related to time. Like in a time machine, DICT enables live cultural activities to be *frozen* and to be *reified* in a physical object (data carrier) on a large scale. Information is stored either by permanent structural changes of the carrier, or by providing different levels of energy to it for a certain period of time. By that DICT transforms use values from a volatile form into a stable material form (DVD, CD-ROM, hard disk, memory chip, USB stick, etc.).

Digital technology also allows the production of cheap copies of frozen activities and their distribution worldwide via the Internet. Because anybody can do the copying at nearly no cost, no market can be established and it is not possible to make profits. To allow for profits, another innovative step is needed.

The role of the law

To enable the establishment of a market and to create full-fledged commodities out of volatile services, capitalist countries developed specific legal instruments combined with appropriate technologies to restrict the possibility of copying. The EU and the US established legal means to deter the violation of copy-protection mechanisms. Back in the 17th century in

England,² experts of law invented an obstacle to the limitless use of, and universal access to, information goods that are now possible by means of DICT – intellectual property rights were put in place.

Enterprises seek to control the former identical copies at the technical level by adding unique identity codes, licences, keys, etc. Each copy is individualised and can be distributed like traditional material commodities. If the copies are not individualised, the information content is generally protected against so-called “unfair use” by intellectual property rights.

By this interaction of technology and law, firstly, use values are reified in digital carriers; secondly, they are transformed by copy protection into commodities that can also have exchange value. By this combination of measures, a large-scale global market for digital carriers is enabled, as well as a secondary market for freezing and unfreezing technologies (such as digital cameras, camcorders, DVD players, iPod, etc.) and for the creation of corresponding infrastructures.

Contradictory effects of commercialisation and commodification

Above we have seen that DICT adds a necessary condition to human activities to transform pure use values into marketable products or services. Although at a first glance there is no difference between commercialisation and commodification, a closer look allows a more differentiated understanding. While commodification is always connected to commercialisation, the latter does not necessarily lead to commodification. The difference can be seen in the analogy of the difference between goods and services. In economic terms (physical) goods can increase and add to the accumulatable part of output created in the economy, while services cannot do that. Services cannot be stored, resold or accumulated. They do not have the potential for

existing longer than in the moment of their production, which is also the moment of their consumption.

Under capitalist relations of production the difference cannot be seen at the surface, because goods and services can be sold with a profit. If one abstracts from this disguise, it becomes immediately clear that an economy based on services only cannot exist in the long run. All available resources would be depleted. Goods (commodities) can refill depleted stocks, whereas services (commercialised use values) cannot. To keep the story short, goods can contribute to long-term economic growth; services as such are not able to do so.

Through commercialisation and commodification many areas of human activities, culture, knowledge, arts, research and entertainment become subject to the market. As a consequence, their price excludes people with limited financial means from using them (see Figure 3).

Many people see the exclusive effect of pricing only in a negative way. People cannot participate in certain forms of consumption and are therefore excluded from, or restricted in, social and cultural participation. Consequently, the argument is extended to the thesis that in such a framework people cannot improve their own social condition; they cannot escape poverty and ignorance. While this is true without any doubt, one should also take into account the positive effects of commercialisation and commodification. It is an argument similar to the one on the extraordinary scientific and cultural achievements at the courts of the Renaissance princes in the north of Italy. These cultural achievements of feudalism have created new ways of understanding the world and looking at it, which has become a common heritage of humankind we would not like to miss today.

Mobile telephony has overcome many restrictions of direct communication. Neither distance nor the location of the communication partners matters any more. It is advantageous to large transnational and global enterprises. It also gives rise to patterns changing for the better in such diverse areas as family life, youth culture, SMEs, emergency services, activities of non-governmental organisations, development policies, etc. (Castells, 2007:1–6).

Although commercialisation and commodifica-

² After the advent of the printing press and with wider public literacy, the Licensing Act of 1662 was established by the King's prerogative. He was concerned about the unfair copying of books and established a register of licensed books. It required a copy to be deposited with the Stationers Company (<http://en.wikipedia.org/wiki/Copyright>).

tion processes have already changed the character of the Internet compared with the 1980s, research scholars would not be able to live without it. Now they have access to information and knowledge worldwide and are able to carry out global research projects. Even if education and training activities will become commodified, in some fields this change could result in better-quality products.

This development can be compared by extension and importance with the commercialisation of work that took place during the first half of the 19th century in England, as described by Karl Polanyi in his book *The Great Transformation* (1944). There he located the transformation of capitalist *economy* into capitalist *society*.

Growing resistance

As in the 1800s, now too these contradictory and ambivalent processes give rise to resistance. In contrast to traditional class struggles related to the fight between capitalists and the working class, however, contemporary struggles focus on the cultural heritage in a very broad meaning of the term. It is the question of availability and universal access to cultural products, which is related not only to manual workers, but also to middle classes, intellectuals and artists, and to parts of the capitalist class itself.

Accordingly one can see growing resistance in many areas at the same time. Even the European parliament was reluctant to subscribe a directive of patents on software or on the human genome. Free software, open source,³ intellectual property rights, creative commons (Lessig, 2004), GNU licences, etc. have become new battlefields for the appropriation of their own culture by the people. But there could be more ...

DICT-assisted “joy of sharing knowledge”?

If the above-mentioned trends are correctly reflected, one has to think about the role and conditions under which DICT can be usefully

implemented to fight poverty and illiteracy, and how one could improve the quality of life of poorer and excluded people, as declared in the South African Constitution (as adapted in May 1996), the Bill of Rights included in the Constitution, and the 1994 Reconstruction and Development Programme (RDP). This is not an easy task at all. Although during the last decades huge amounts of money have been spent on investments in large corporations, including in South Africa, to increase the number of jobs and create employment and income, the effects were disappointing.

A rather extreme example in South Africa (Damoens & Simon, 2004:251-269) showed that for the refurbishing of a mine R320 million (€40 million) was spent for a net gain of 13 jobs. In fairness, it also changed the productivity of existing jobs. Another example is the case of the South African Motor Industry Development Programme (MIDP), which did not have any positive net effect on employment. On the contrary, from 1988 to 2000, the car assembly industry shrank from 35 000 to 32 300 jobs, and the component industry from 60 000 to 38 500.

The UN (UNDP, 2003) has submitted a report that this strategy has produced an increase of unemployment, poverty and violence:

As a result, the Human Development Index has worsened (from 0.73 in 1994 to 0.67 in 2003), poverty still engulfs 48.5% of the population (21.9 million in 2002), income inequality has increased (from 0.60 in 1995 to 0.63 in 2001), the majority of households have limited access to basic services, and the official unemployment rate has sharply increased to more than 30% in 2003 [...] The economy provided only 11.56 million jobs for 16.81 million economically active South Africans in March 2003, resulting in 5.25 million unemployed, or an official unemployment rate of 31.2%, which is substantially higher than the 19.3% unemployment rate in 1996.

Indeed, the poverty level of the population varies according to different sources, ranging between 40 and 50% (South Africa, 2003:iii).

For this reason, this chapter invites a discussion about how to contribute alternatively to the fight against poverty and ignorance. This is based on experiences in other countries, such as Bergmann & Mauersberger's (2007) “New Work” commu-

³ Cf. the Open Source Yearbooks – annual since 2004, <http://www.opensourcejahrbuch.de/>; also see Fuchs (2007:57-86).

nities in the US, targeted intelligence networks,⁴ and the institution of *misiones* in Venezuela.⁵ These initiatives are described below.

The presented examples are not thought to be applied as they are, but should be modified and rethought to take on board the new opportunities of DICT (Fleissner, 1995:127-135). Their ambivalences should also be taken into account. Enabling and empowering techniques and basic infrastructure have to be provided to create the necessary skills and the possibility of universal access, even if the falling transaction costs allow information and communication activities to be provided cheaply. The commercialisation and commodification of information goods can be challenged by legal support of open source/free software and by fostering copyleft licences. Linked to these examples, I propose an integrated effort to combine grassroots movements, transportation, DICT and other infrastructures, and financial, institutional and legal support by the state to improve the socioeconomic and cultural situation in Africa.

Frithjof Bergmann's "New Work" paradigm

Stanford Professor Frithjof Bergmann developed the "New Work" paradigm during the US car industry crisis in the early 1980s. He gained a great deal of experience in the implementation of Communities of New Work in many countries all over the world. The network formed stretches from the Ukraine, to India, to countries in Europe (in particular, Germany and Austria), but also to Japan and South Africa, where it found support by the Department of Social Development.

In sharp contrast to the paradigm of economic development based on job creation, which dominated during the last decade, at the core of the "New Work" communities is the idea of development through building up high-tech platforms that enable communities to produce for themselves the requisites for a fulfilling life. DICT should be one of the high-level technologies used. By promoting DICT infrastructure to the entire country, and guaranteeing universal

access to it, one could also improve the general level of computer literacy and thus create new opportunities for small-scale businesses. On the other hand, it is evident that technical Internet access alone without measures to increase computer literacy will not bring the desired results.

Prof. Bergmann's Communities of New Work could mean an alternative to the traditional approach of development by using advanced technologies in service of the poor. A workplace in such a community promises to be much cheaper than the capital investment needed for a new workplace in manufacturing industries.

The implementation of "New Work" is a stepwise procedure. This community-oriented approach firstly offers people opportunities to produce their own foodstuffs and water supply within a social network they are used to live in. The competitiveness of these enterprises is of secondary importance at this stage. As a next step, they could produce surplus to be sold to their community or even exported. The basic steps will lay the groundwork for further developments, such as the production of washing machines whose filters allow reusing the water up to ten times. Besides the economic effects of the production of water filters, the product could improve the general social and physical wellbeing of countless South African communities where water is scarce.

Targeted intelligence networks

Targeted intelligence networks (TINs)⁶ were identified in the context of the crisis of the welfare state in Central Europe. The following existing examples of alternative institutions were found:

- *Peer group care* is a complementary small group, personal support structure for the elderly, poor, disabled and other outsiders, established in Germany and Austria, and supported by faith-based communities.
- *Study circles* complement traditional schools, and are established in Scandinavian countries as secularised forms of Bible-reading groups.

⁴ http://igw.tuwien.ac.at/peterf/Fleissner_e.pdf;
<http://www.rosalux.de/cms/index.php?id=10268>.

⁵ <http://www.misionesbolivarianas.gob.ve/>.

⁶ For more details see <http://members.chello.at/gre/fleissner/documents/work/work.pdf>. 8.

Karlsson & Fleissner (2000)⁷ describe how they are already linked to DICT.

- *Workers' health assurance groups* improve the occupational ill-health status. In the 1970s they were operational in Italian enterprises, initiated by trade unions.
- *Intrapreneurial groups* act against alienation in the workplace and provide a training ground for taking over responsibility and practising the ability of decision making. They are not yet realised fully, and are approximated by autonomous groups of workers at the car maker Volvo in Sweden.

As examples to illustrate how self-empowerment and self-determination can be trained, they share the following common features:

- There should be voluntary cooperation in small groups towards a shared goal and an integrated effort to combine grassroots movements, technical infrastructure (especially DICT), and financial and legal support by the state to create a better quality of life, in particular for more vulnerable groups of society.
- An institutional framework has to be created within which these new forms can emerge. Financial, infrastructural, material and educational resources are needed to empower people to take up their new tasks voluntarily.
- This also implies certain ways of compensation and remuneration for their efforts and contribution to society.
- Other existing social activities and features of the welfare state should be complemented and not replaced by TINs.
- A very important issue is how TINs should be monitored and controlled to create a process of self-improvement.

The establishment of TINs will depend, among other things, on the existing level of income, the amount of leisure time left over after the necessities of work, the psychological status of the majority of people, increased experience of crisis symptoms, increased feelings of anxiety and stress, and the availability of political support. The involvement of people in social affairs could afford them more direct experience with the destructive tendencies of societal

changes. This will probably sharpen their awareness of, and motivation to fight against, negative tendencies of social change.

Bolivarian Missions

As a final example, new institutions are presented that have already been established successfully, perhaps because of particularly favourable conditions brought about by political leaders. Still, there is much work to do on how to combine these institutions with DICT.

Oil profits of about US\$25 billion in 2004 have allowed the Chávez administration in Venezuela to establish special social programmes called the "Bolivarian Missions". They include a remarkable increase in spending on social programmes. The Chávez administration has built free healthcare clinics, subsidised food and created small manufacturing cooperatives. The programmes have constructed and modernised thousands of public medical and dental clinics; launched massive literacy and education initiatives (it is said that these initiatives have made more than one million adult Venezuelans literate); subsidised food, gasoline and other consumer goods; and established numerous worker-managed manufacturing and industrial cooperatives. Critics allege that these programmes are corrupt and inefficient, while a number of international organisations – including the UN, UNICEF and the World Health Organisation – have praised the programmes as positive models for bringing about social development. There have also been marked improvements in infant mortality rates between 1998 and 2005.

The Missions have overseen widespread experimentation in what Hugo Chávez's supporters term *citizen- and worker-managed governance*, as well as the granting of thousands of free land titles, reportedly to formerly landless poor and indigenous communities. In contrast, several large land estates and factories have been, or are in the process of being transferred to the hands of the workers. I have had the opportunity to experience the mood of the people at the occasion of the presidential elections in December 2006. I am all the more convinced of the success of the Missions since I found data on the rate of unemployment for the last six years (Figure 4).

⁷ Note that www.jrc.es will be changed to ipts.jrc.ec.europa.eu.

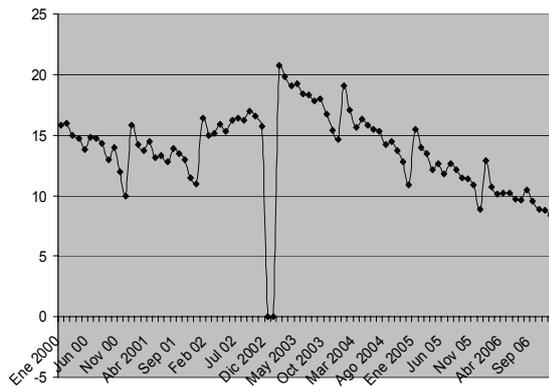


Figure 4: Unemployment rate (%) in Venezuela, 2000–2006
Source: <http://www.ine.gov.ve/hogares/Seleccion Hogares.asp>

The examples given here provide some food for thought about the directions the new initiatives in South Africa could take by embracing the positive side of DICT. Most certainly this is not the end of the debate.

REFERENCES

- Bergmann, F. 2004. *Neue Arbeit, neue Kultur: Ein Manifest*. Translated by S. Schuhmacher. Freiburg: Arbor.
- Bergmann, F. & Mauersberger, K. 2007. *Neue Arbeit kompakt*. Freiburg: Arbor.
- Castells, M., Fernandez-Ardevol, M., Qiu, J.L. & Sey, A. 2007. *Mobile communication and society: A global perspective*. Cambridge, MA: MIT Press.
- Danoens, M.Y. & Simon, A. 2004. An analysis of the impact of the first phase of South Africa's Motor Industry Development Programme (MIDP), 1995–2000. *Development Southern Africa*, 21(2): 251–269.
- Fleissner, P. 1995. Max Webers Bürokratietheorie im Lichte elektronischer Kommunikationsmedien. In Huber-Wäschle, F., Schauer, H. & Widmayer, P. (Eds), *GISI 95: Herausforderungen eines globalen Informationsverbundes für die Informatik*. Berlin: Springer, 127–135.
- Flichy, P. 1994. *Tele: Geschichte der modernen Kommunikationsmedien*. Frankfurt and New York: Campus. (Original French version published in 1991.)
- Fuchs, C. 2007. Cyberprotest and Demokratie. In Fleissner, P. & Romano, V., *Digitale Medien – neue Möglichkeiten für Demokratie und Partizipation*. Berlin: Trafo, 57–86.
- Gramsci, A. 2004. Americanismo e Fordismo. *The Prison Notebooks 9*. Written in 1929–1932, first published in 1949. German translation by Haug, W.F. & Bochmann, K. (Eds), *Gefängnishefte Band 9, Heft 22–29*. Berlin: Berliner Institut für Kritische Theorie.
- Internet World Stats. n.d. <http://www.internetworldstats.com/stats.htm>.
- Karlsson, L. & Fleissner, P. (Eds). 2000. *Study circles in targeted intelligence networks*. Seville: Institute for Prospective Technological Studies of the European Commission. <http://www.jrc.es/home/pages/detail.cfm?prs=329>.
- Lenin, W.I. 1962. Bericht über die Tätigkeit des Rats der Volkskommissare. VIII. Gesamtrussischer Sowjetkongress. 22 Dezember 1920. In Lenin, W.I., *Werke, Band 31*. Berlin: Dietz, 483–515.
- Lessig, L. 2004. *Free culture: How big media uses technology and the law to lock down culture and control creativity*. New York: Penguin Press.
- Marx, K. 1962. Das Kapital. Band 1. In: *Karl Marx und Friedrich Engels Werke*, Bd. 23, Erster Abschnitt. Ware und Geld. Berlin: Dietz. (See <http://www.marxists.org/archive/marx/works/1867-c1/ch01.htm#S1> for the English translation.)
- Polanyi, K. 1978. *The great transformation*. Frankfurt am Main: Suhrkamp. (Original English version in 1944.)
- Smith, A. 1776. *The inquiry into the nature and causes of the wealth of nations*. Book 1. London: Dent & Sons.
- South Africa. 2003. *Ageing and poverty in South Africa*. South African Department of Social Development, Dar es Salaam. <http://www.un.org/esa/socdev/aging/workshops/tz/south%20africa.pdf>.
- United Nations. n.d. United Nations Statistics Division. <http://unstats.un.org>.
- United Nations Development Programme (UNDP). 2003. <http://www.undp.org.za/NHDR2003.htm>.
- Williamson, O.E. 1985. *The economic institutions of capitalism*. New York: The Free Press.