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On the ambivalence of information and communication technologies

Abstract:

The diffusion of digital information and communication technologies (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 these 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, others to control terrorism and crime, while grass root movements expect to become more influential on some aspects of society. The paper identifies and analyses basic tendencies which promote the various hopes: the effects of DICT on reducing production and transaction costs, and the possibility to transform information goods into marketable services or commodities. The final part of the paper is devoted to a few examples of how the potential of DICT can be used for social improvements.

Agenda

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ISSN 1614-1687

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 a phenomenon far from being new in history. Chappe's optical telegraph in the French Revolution[1], Henry Ford's assembly lines[2], and Lenin's statement[3] in 1920 "Communism - that is Soviet power and electrification of the whole country" are prominent examples of technologies related to social improvements of one or another kind. But at a closer look 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 technologies (DICT) it seems to be 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 socio-economic 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 the success. 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 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 Web pages at CERN, Geneva. In 2007 Internet Usage Statistics indicates there are around 1.1 billion users world wide (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 world wide (30,3% per year between 2000/2007).[4] The annual growth of 23.7% (between 2000/2004) of mobile communication subscribers in South Africa is also remarkably high.[5] The increased diffusion of these two kinds of DICT amplifies two essential economic effects: Falling transaction costs, increased commodification of information goods, and the 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 not only related 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 a 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 fig. 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[6] have proven that the potential set of players to perform productive activities can change, e.g. small or medium sized enterprises

[1] Flichy, Patrice: Tele. Geschichte der modernen Kommunikationsmedien. 21ff

[2] Gramsci, Antonio: Amerikanismus und Fordismus. 303

[3] Lenin, Wladimir Iljitsch: Bericht über die Tätigkeit des Rats der Volkskommissare. 483-515, 513

[4] http://www.internetworldstats.com/stats.htm

[5] http://unstats.un.org

6 See Williamson (1985) for a classical example: the end of the „putting-out-Systems" and the birth of the „factory-Systems" in Great Britain in early capitalism.

ISSN 1614-1687

(SME) formerly bound to local markets, can now become global actors because of DICT. Technology can empower new individuals, groups or organisations to perform new activities, but can also bring traditional players under pressure.

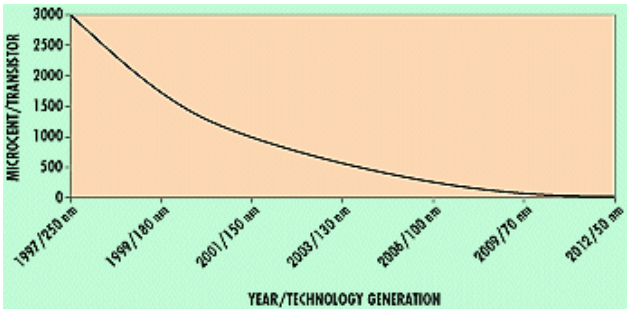

Figure 1: Falling costs per transistor[7]

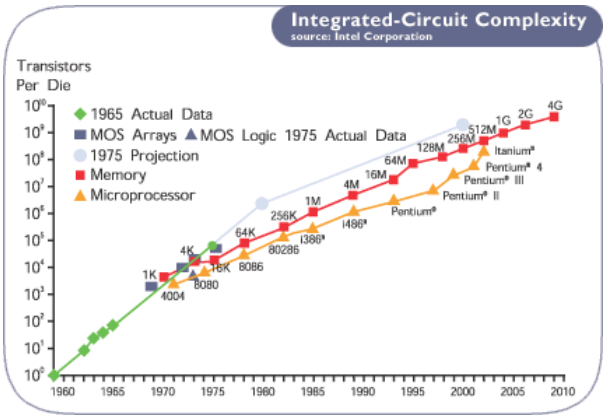

Figure 2. Increasing number of transistors per die[8]

Commercialisation and commodification

There is a growing tendency of the market to cover new fields of human activities (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[9] and Karl Marx[10] 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 *value in exchange* (a thing has a value for other people than the producer. They pay for them 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"*[11]

But what about human activities which 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 type.

The 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 to describe the effects of 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

[7] Source: www.micromagazine.com/archive/98/03/9803m51b.gif

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

[9] Smith, Adam: The Inquiry into the Nature and Causes of the Wealth of Nations. Book 1, Chapter 4.

[10] Marx, Karl: Das Kapital. Vol. 1. See http://www.marxists.org/archive/marx/works/1867-c1/ch01.htm#S1 for the English translation.

[11] Aristoteles: "De Rep." l. i. c. 9. See also http://www.econlib.org/library/YPDBooks/Marx/mrxCpANotes.html, footnote 47.

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course we have experienced a predecessor of this effect: fixed-line telephony. But now 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 commercialized service one has to pay for. New markets have been opened up which have become very profitable beyond the borders of Europe.

The 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 *reify* them 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 (e.g. DVD, CD-ROM, Hard Disk, Memory chip, USB-Stick etc.).

Digital technology also allows the production of cheap copies of the frozen activities and to distribute them worldwide via the Internet. Because anybody could do the copying at nearly no cost, no market can be established. 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 U.S. established legal means to deter the violation of copy-protection mechanisms.

Back in 17th century in England,[12] experts of law invented an obstacle to the limitless use of, and universal access to, information goods now possible by means of DICT – Intellectual Property Rights were put in place.

[12] 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 by 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

Enterprises seek to control the former identical copies at the technical level by adding unique identity codes, licences, keys etc. Each copy is individualized and can be distributed like traditional material commodities. If the copies are not individualized, the information content is generally be 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 which 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 (like 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, commercialisation 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 can neither be stored, nor resold nor 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 the depleted stocks, whereas services (commercialized 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.

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

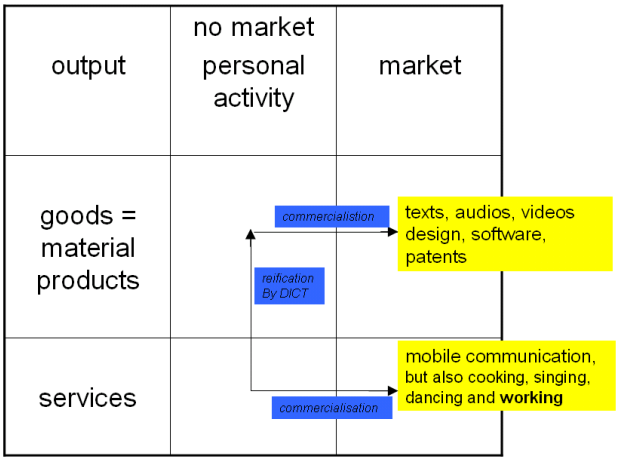

Figure 3: Commercialisation and commodification in the information society

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 doubts, one should also take into account the positive effects of commercialisation and commodification. It is a similar argument like 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 common heritage of humankind we would not like to miss today.

Mobile telephony has overcome many restrictions of direct communication. Neither distance nor location of the communication partners matter any more. It is advantageous to large trans-national and global enterprises. It also gives rise to patterns changing for the better in such diverse areas as family life, youth culture, small and medium sized business, emergency services, NGO activities, and development policies, etc.[13]

Although commercialisation and commodification processes have already changed the character of the Internet compared to the 1980s, research scholars would not be able to live without it. Now they have access to information and knowledge world wide and are able to do global research projects. Even if education and training activities will become commodified, in some fields this change could result in a better quality of products.

This development can be compared by extension and importance with the *commercialisation of work* which happened during the first half of the 19th century in England which was described by Karl Polanyi[14] in his book "The Great Transformation" (1944). There he located the transformation of capitalist *economy* into capitalist *society.*

Growing resistance

As it was the situation in the 1800s, also now these contradictory and ambivalent processes give rise to resistance. But in contrast to traditional class struggles related to the fight between capitalists and the working class, the 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 not only related to manual workers, but also to middle classes, intellectuals, 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/libre software, open source[15], intellectual property rights, creative commons[16], GNU Licences

[13] Castells, Manuel et al: mobile communication and society. 1-6

[14] Polanyi, Karl: The Great Transformation.

[15] e.g. Open Source Yearbooks (annually, since 2004) http://www.opensourcejahrbuch.de/; Fuchs, Christian: Cyberprotest und Demokratie. 57-86

[16] Lessig, Lawrence: Free Culture – How Big Media uses Technology and the Law to lock down culture and control creativity.

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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 the conditions under which DICT can be usefully implemented to fight poverty and illiteracy, and how one could improve the low quality of life of poorer and excluded people - as it is 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 South Africa, to increase the number of jobs and to create employment and income, the effects were disappointing. A rather extreme example in South Africa[17] showed that for the refurbishing of a mine 320 million RAND = 40 million EUR were spent for a net-gain of thirteen jobs. In fairness, it also changed the productivity of the existing jobs. Another example is the case of the South African Motor Industry Development Programme, which did not have any positive net effect on employment. On the contrary, from 1988 - 2000 the car assembly industry shrank from 35.000 to 32.300 jobs, the component industry from 60.000 to 38.500.

The United Nations have 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 per cent, which is substantially higher than the 19.3 per cent unemployment rate in 1996."[18] The poverty level of the population varies according to different sources ranging between 40 and 50%.[19]

For this reason the paper invites a discussion about how to contribute alternatively to the fight against poverty and ignorance. This is based on experiences in other countries like Frithjof Bergmann's "New Work" Communities[20] in the United States of America, on Targeted Intelligence Networks[21], and on the institution of "misiones" in Venezuela[22]. 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[23]. 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 performing 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 licenses. Linked to these examples the author proposes an integrated effort to combine grass roots movements, transportation, DICT and other infrastructures, and financial, institutional and legal support by the state to improve the socio-economic and cultural situation in Africa.

[17] Danoens, Maylene Y., and Alan Simon: An analysis of the impact of the first phase of South Africa's Motor Industry Development Programme (MIDP), 1995-2000. 251-269, 261/262

[18] http://www.undp.org.za/NHDR2003.htm

[19] South African Department of Social Development: Ageing and poverty in South Africa. iii

[20] Bergmann, Frithjof, and Stephan Schuhmacher: Neue Arbeit, neue Kultur.

[21] http://igw.tuwien.ac.at/peterf/Fleissner_e.pdf; http://www.rosalux.de/cms/index.php?id=10268

[22] http://www.misionesbolivarianas.gob.ve/

[23] Fleissner, Peter: Max Webers Bürokratietheorie im Lichte elektronischer Kommunikationsmedien. 127-135

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Frithjof Bergmann's "New Work" paradigm

Stanford Professor Frithjof Bergmann developed the "New Work" paradigm during the crisis of U.S. car industries in the early 1980s. Prof. Bergmann gained a lot 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 in 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 exerted control during the last decade core of the "New Work" Communities is the idea of development through building up high technology 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 by guaranteeing universal access to it, one could also improve the general level of computer literacy and 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 the 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. While this community oriented approach firstly offers the people opportunities to produce their own foodstuff and water supply within a social network they are used to live in. The question of 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 be exported. The basic steps will lay the groundwork for further developments, e.g. the production of washing-machines where filters allow for reusing the water up to ten times. Besides the economic effects the production of water filters itself, the product could improve the general social and physical well-being of countless South African communities where water is scarce.

Targeted Intelligence Networks (TIN)

TINs[24] 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, supported by faith communities);

"Study Circles" to complement traditional schools (established in Scandinavian countries as secularised forms of bible reading groups). Karlsson/Fleissner[25] describes how they are already linked to DICT;

"Workers' Health Assurance Groups" to improve the occupational ill-health status (in the 1970s they were operational in Italian enterprises, initiated by trade unions), and

"Intrapreneurial Groups" against alienation on the workplace and to provide a training ground for taking over responsibility and the ability of decision making (not yet realized fully, approximated by autonomous groups of workers at the car maker Volvo in Sweden).

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

- Voluntary cooperation in small groups towards a shared goal and an integrated effort to combine grassroots movements, technical infrastructure, in particular DICT, and financial and legal support by the state to create a better quality of life, in particular for the more vulnerable groups of society
- An institutional framework has to be created within that these new forms can emerge. Financial, infrastructural, material and educational resources are needed to empower people to take over their new tasks voluntarily.

[24] For more details see http://members.chello.at/gre/fleissner/documents/work/ work.pdf. 8

[25] Karlsson, Lars, and Peter Fleissner (ed.): Study Circles in Targeted Intelligence Networks. http://www.jrc.es/home/pages/detail.cfm?prs=329. www.jrc.es will be changed to ipts.jrc.ec.europa.eu.

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- This implies also certain ways of compensation and remuneration for their efforts and their contribution to society.
- Other already existing social activities and features of the welfare state should be complemented and not replaced by TINs.
- A very important issue: how should the TINs be monitored and controlled to create a process of self-improvement?

The establishment of TINs will depend among others on the existing level of income, on the amount of leisure time left over after the necessities of work, on the psychological status of the majority of people, on increased experience of crisis symptoms, on increased feelings of anxiety and stress, and on 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 and that will probably sharpen their awareness and motivation to fight against negative tendencies of social change.

Bolivarian Missions

As a final example, new institutions are presented that are already established successfully, maybe 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, being about US$25 billion in 2004, have allowed the Chávez administration in Venezuela to establish special social programmes – the "Bolivarian Missions."[26] They include a remarkable increase in spending on social programs. The Chávez administration has built free health care clinics, subsidized food and created small manufacturing cooperatives. The programs have constructed and modernized thousands of public medical and dental clinics, launched massive literacy and education initiatives (it is said that these initiatives made more than one million adult Venezuelans literate), subsidized food, gasoline, and other consumer goods, and established numerous worker-managed manufacturing and industrial cooperatives. Critics allege that these programs are corrupt and inefficient, while a number of international organizations — including the UN, UNICEF, and the WHO — have praised the programs as positive models for bringing about social development. There have been also 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.

The author had the opportunity to experience the mood of the people at the occasion of the presidential elections in December 2006. He is the more convinced about the success of Missions since he had found data on the rate of unemployment for the last six years:

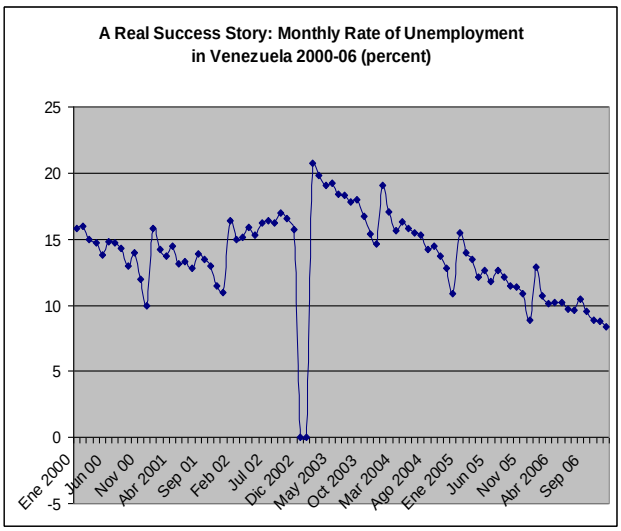

Figure 4: Unemployment Rate in Venezuela 2000/06[27]

The examples above 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.

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