

## Qualitative, dialectical, and experiential domains of Electronic Art

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*"The wheel's hub has thirty spokes  
Utility depends on the hole through the hub.  
The potter's clay forms a vessel.  
It is the space within that serves.  
A house is built with solid walls  
The nothingness of window and door alone renders it usable,  
That which exists may be transformed  
What is non-existent has boundless uses."  
- Lao-Tse*

Perhaps there has been a time when men in all cultures handled rather similar objects, which demanded similar skills and were used for the same sort of tasks. Seen in today's perspective - when technological developments are rapidly and enormously increasing the differences among societies - this egalitarian view sounds absurd and naive. Countries have been mainly categorized in terms of their technological stage, in spite of their natural resources, their territories, their people or their cultures. Because of technology, the world has been divided into the First and the Third.

The expansion of the use of computer technology poses serious problems for developing nations, and makes us reconsider the idea that technology is always a synonym for progress. The modern way of living of the consumer society - a model originated in the First World - forces the adoption of a unique model on both developed and developing countries. This model jeopardizes or, in most cases, destroys the possibility of generating differing technological alternatives, according to the cultural, social and economic parameters of a given context.

Different groups may give different solutions to the same problem. In India, camels are still vastly used in many cities as a transportation means. In Thailand, millions of motorbikes were transformed into three-wheeled machines with a coverage, which are known as "tuc-tuc". A sort of rickshaw - pulled by a person riding a bike, is another largely used means of transportation in many Asiatic countries. Horse coaches and oxcarts are commonly seen in Brazil, in rural areas. And bikes - of all sorts, sizes and shapes - are the most popular means of transportation in China. Creativity, inventiveness, the power to adapt and adequate to each group's needs, are these devices' common denominator. But cars look basically the same in India, Thailand, China or Brazil, as in Europe or North America. This is not a result of the international widespreading of

an optimum product development, which prevails over other product designs for its inherent qualities. It is a consequence of technological dominance.

But although cars, fridges, motorbikes and telephones look pretty much the same around the world, computers undoubtedly represent the most threatening example of technological and cultural dominance of our time. As an intellectual tool, the computer is an environment that has many values and biases associated with it [1]. In essence, computer equipments reflect the predominant logic, attitudes and views of the First World. Alternative technological solutions do not easily emerge from computer research groups in developing countries, mainly due to economic reasons. As an inevitable result, a basic computer technological model is spreading all over the world.

The continuing growth of the use of computer-related technologies in developing countries - in which illiteracy often reaches high figures and represents a major social problem - is leading towards a very critical situation. Unlike other technologies, such as the radio and the TV - which are very popular among illiterate people in these countries - computers are still highly based on written, verbal communication. Up to now, the use of computers in the Third World is mainly confined to industries, offices and universities. But the scale of technological development seems set for inexorable growth. It is predicted that in the near future people in these countries will need to interface with computing devices for most of their daily tasks, as it already happens in the developed nations. According to Nicholas Negroponte, in "the modern world" every person uses at least 12 computers a day, from fax machines to cooking equipments [2].

This prospect brings the issue of computer literacy to light. As Freire discusses in his book "Pedagogy of the Oppressed" [3], literacy is not a question of being able to read and write, but of being able "to say someone's own word", as a culture generator. It is the significance of the message contents that counts in a intersubjective dialogue, not merely the mechanical repetition of words. One may ask then what "computer literacy" means. Is it related to the pressing of keys and icons, or to the grasping of the underlying logic of computers as symbol processing machines? Is it measured by the level of someone's mastering of computer devices and jargons, or by the level of conscious interaction with the equipment, as in an intersubjective dialogue?

In most developing nations, we are witnessing the advent of what can be called "double illiteracy": people who are already on the fringe for not sharing the codes of a reading and writing society, and that now might be out of the system for not mastering the use of computers.

After banks have introduced magnetic cards and automatic cashier machines - aiming at making the client's life easier - things have become more complex to many of their users, in developing nations. One can observe a high degree of difficulty when illiterate or semi-literate people have to interface with a computer - even when what is required is simply entering their code number in a 12-button keyboard or finger-pointing on a touch-screen monitor the numbers relative to the amount of money they want to cash. Although even illiterate adults frequently master the use of numbers, and can perform simple arithmetical operations in their daily routine - such as giving the right change at the street market, using the telephone dial, or choosing the right bus to catch - for some reason it seems more complex for them to deal with this new devil's machine. If interactivity is considered to be the core of computer-related technologies, then it is necessary to analyse the implications of an interactivity primarily based on verbal written communication in countries

where a great portion of the population is illiterate or semi-illiterate.

As a technology that can only manipulate explicit data and symbols according to formal, syntactical rules, computers tend to legitimize those types of knowledge that fit into their framework and delegitimize other types of knowledge. Epistemological methods such as interpretation, intuition, introspection and dialectical synthesis of multiple and contradictory realities are not legitimated by computer technology. Streibel emphasizes that the more computers are used as intellectual tools, the more this process of legitimization and delegitimization takes place: "The more we rely on the formal characteristics of knowledge, the less we rely on the tacit and interpretative dimensions of knowledge." [4].

If, on the one hand, the expressive facet of computers has greatly improved by the advent of multimedia resources, on the other hand computers' capability of receiving human inputs is still very limited. Most of the time our emotions and ideas are funnelled and restricted to the pressing of keys or to moving a point-and-clicking device.

Computers still do not recognize the user as a specific individual: the human is treated by the computer as a generic type, not as the actual person. Although human-computer dialogues aim at resembling interpersonal conversations, Bork [5] points out that these dialogues are a form of behavioural technology where dialogical interactions are controlled by an author who is not part of the actual interaction. While interpersonal interactions have a conjoint control as their essential component, interactive computer programs only permit the user to make decisions from a pre-defined set of choices. "The existence of interactive systems doesn't automatically imply a democratic turn, a redistribution of power from "the producer" to "the consumer", or a reorganization of the information traffic." [6].

One of the major challenges we face today is to create computers that have a degree of good sense and comprehension. Computers have no understanding about the information units they process. If the communication channels could recognize the information contents, personalised systems that could filter and generate information for a one-person audience could be developed. Darley [7], says that if new technologies are to enable "egalitarian, more democratic, constructive forms, offering new kinds of interaction, knowledge, and understanding", these possibilities have to be struggled for.

Under this scenario, we ask what should be our responsibility as electronic artists. How can artists interfere in this process, so that human, social and cultural aspects are considered in the development of computer-related technologies? Is the role of the artist who uses emergent technologies in the Third World different from the role of those who deal with Electronic Art in the First World?

These issues encompass two different perspectives, that are, however, strongly interlaced. The first one concerns the governing rules of the development and implementation of computer-related technologies. The second perspective is related to the interdisciplinary dialogue between artists and scientists.

In the first perspective, it is important to consider computer technological development as an international issue. Operating on a global scale brings problems related to the topdown transfer of

technology - from First to Third World countries - and exacerbates the issue of cultural dominance. Kaplinsky [8] focuses on aspects of potential conflict in the transfer of technology and mechanisms which are used to enforce the control of the dominant group. He says that any set of complex relationships between different individuals or groups is likely to lead to some misunderstanding and conflict. In the case of the transfer of technology, however, "conflict does not result merely from misunderstanding others' motives and intentions, but it is fundamentally built into the nature of the transactions." According to him, the reason for that is that the technology which is transferred is a primary input for the generation of surplus. "Control over this technology is thus crucial, not only because it leads to control over the generation of this surplus, but also because it is an important element in the control of the distribution of the surplus."

Galeano says that the big cities of the south of our planet are exactly like the ones of the north, but seen through a distorting mirror: the copying effect of modernization multiplies the model's errors and defects [9].

These problems also occur on a national scale. The already existent gap in most developing countries between the elites and the poor - in some cases, the top tenth of the population controls nearly half the nation's wealth [10] - is likely to increase as a result of the introduction of computer technologies. The illiterate man from a developing country will suffer the double unfavorable condition of not being a citizen of the First World - with all the technological advantages that this means - and of not being part of the restricted group of the Third World who may have access and therefore will master the computer logic and skills. The introduction of computers in everyday life will even be more aggressive to this 'deprived man', as he will not be able to gradually learn, master or interfere with this new technology. Yet, in the end, computers will be imposed on him.

In his report on the study of pictorial perception among African subjects, Hudson [11] says: "We take it very much for granted that methods which are only moderately successful in our own cultures will prove equally, if not highly, successful in an alien culture. We fall into the error of thinking of the black man's mind as a *tabula rasa*, which we have only to fill with the benefits of our own cultural experience in order to promote whatever objectives we may have in mind. We forget or ignore the fact that the black man possesses his own indigenous culture."

In the light of these problems, we may conclude that the introduction of computer technologies will not possibly lead to an improved social yield in developing nations. But there is still hope. Malina [12] names contemporary artists "technology colonizers" and quotes McLuan, when he says that the artist's role is to explore and spread the new environments offered by technology. We may infer that, as colonizers, artists are expected to explore and establish new territories. Much, however, depends on our awareness of the actual situation, on our understanding of the frontiers and possibilities, and on our participation in technological research.

This issue brings the second perspective into discussion: the interdisciplinary dialogue between artists and scientists. Although the basic approaches of these professional groups usually differ, it is misleading to segregate human actions into 'art', 'science' and 'technology': new areas of research are emerging as a consequence of collaborative work among artists and scientists. It is a must that the artistic focus be incorporated in the process of new technological developments; without that focus these technologies will not reach their original goal, which is to meet human

needs and desires. As artists, we can criticize, interfere in and deviate technological trends from inadequate directions. When the stick is crooked it bends to one side and if you want to straight it, it is not enough placing it into its correct position. You've got to bend it to the opposite side. This is one of the things electronic artists can do with/for emerging technological developments. Technologists working in isolation are far from discovering the intricacies of social and cultural issues, and their view may bend technology to its utilitarian extreme. As artists, we need to bend it to the other, by taking into account the complexity of human-machine relationships in a socio-cultural perspective. As a result of these opposed and complementary views and attitudes, technology may be perceived and used by the general public in its intermediate final shape, as a sum of scientific and artistic perspectives. Human, social and technological areas of knowledge should have never been divorced, as they are complementary parts of the holistic human experience.

If we are to understand the effects that computers have on society, say Winograd and Flores, "we must reveal the implicit understanding of human language, thought and work that serves as a background for developments in computer technology." [13]. In asking what computers do we are ultimately addressing the fundamental question of what it means to be human. Electronic artists are gradually discovering combinations of the expressive potential of human natural languages - which extend over aesthetic, metaphoric, artistic, affective and moral domains - and the objective, quantitative and procedural characteristics of computer technology.

Yet artists and scientists' views are not de-contextualized or isolated from a socio-historical situation. Geographical, cultural, political, economic factors affect their perception and guide their actions. Electronic artists working in the First World greatly differ from those working in the Third World not only in terms of their approaches and resources, but mainly in terms of their access to computer-related technologies' developers. As regards the problem of "double illiteracy" in developing nations, electronic artists in the First World may be able to interfere in a more direct way than their colleagues in the Third World, by actually having the opportunity to take part in the development of new trends in computer-related technologies

Penny [14] points to the advent of a new professional identity - "the interactive media artist, an interdisciplinarian as comfortable with cultural coding as with computer code...". We can make computer technology move into an era of new values concerning cultural issues, as part of the interactive dialogue among humans and machines. Art and science must merge into one single process of cognition. Artists and technologists - from the First and the Third Worlds - may blend their different perceptions and knowledge in order to enable the construction of a qualitative, dialectical and experiential electronic expressive language.

The time is right for the adoption of such an approach. In fact, the main challenge of this decade is to establish a socio-technical commitment capable of addressing problems of both local and global scope. In a world of social, cultural and economic disparities, maintaining a balance between uniqueness and uniformity needs to be the contemporary electronic artists' major struggle. Better times may be on the way.

## NOTES:

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