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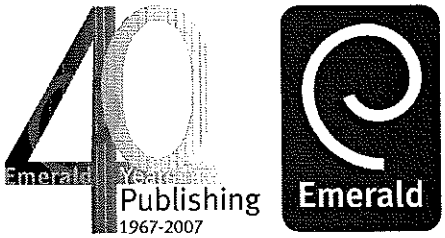
Architecture as a verb: cybernetics and design processes for the social divide

Anja Pratschke
Department of Architecture and Urbanism, University of São Paulo, São Carlos, Brazil



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Architecture as a verb: cybernetics and design processes for the social divide

Anja Pratschke
Department of Architecture and Urbanism, University of São Paulo, São Carlos, Brazil

Abstract

Purpose – This paper aims to draw on current research in public policy, and more specifically about a collaborative design process for a poor suburban community in São Paulo, Brazil and its relation to social cybernetics as the "science of effective organization." The research project in public policy, online-communities, has been financed by the state-sponsored agency FAPESP since 2003, and involves four research groups from the Architecture and Computer Science Departments at the University of São Paulo, and various public and non-governmental organizations under the coordination of Nomads.usp Research Center (Center for Studies on Interactive Living, www.eesc.usp.br/nomads).

Design/methodology/approach – The design methodology includes three premises: an organization of the team which considers multidisciplinary and multicultural aspects; the involvement of potential users as creators of the virtual community and of its concrete space; and the concern that the process will be organized so that autonomy and evolution take place.

Findings – Special interest in the comparison of architectural methods and cybernetics is to understand how information and communication are dealt with using a design process to promote active exchange of knowledge and competences, and to improve interaction and conversation in a local context of large social differences, affected by lack of opportunities and regulating structures.

Practical implications – Owing to its constant questioning of viability, adaptability and recursion, cybernetics should be able to make the designer team constantly revise the proposal to change conditions during its process of implementation and later autonomy.

Originality/value – The paper discusses the actual relevance of the use of the cybernetic theory as a way to improve information and communication between designers and the population in poor communities.

Keywords Cybernetics, Public policy, Brazil, Design, Sociocybernetics, Economic cooperation

Paper type Research paper

1. Introduction

> (...) No one should be interested in the design of bridges – they should be concerned with how to get to the other side (Price, 1984).

We are actually at a turning point, obliged in a certain way to question traditional design methods and evaluate their relevance, at a time where circulating information

This paper shows partial results of the research project in public policy: Online_communities, under the general coordination of Dr Marcelo Tramontano, and relates them to ongoing research about complexity, collaborative design process, and social cybernetics, being developed in Nomads.usp. The author extends special thanks to Dr Rodrigo Firmino, Fernanda Borba Januário and Jane G. Coury for revising and providing useful comments.

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and especially various forms of communication, helped by different kinds of media and computer technologies, lead us to live in a so-called global dimension, a hybrid state formed by global and local dimensions, which considerably alter the social and cultural relations, as well as ways of life. The research project Online_communities, located at the most distant neighborhood of São Paulo, called Cidade Tiradentes has been developed since 2003 under the coordination of Nomads.usp Research Center (Center for Studies on Interactive Living, www.eesc.usp.br/nomads). It was, in fact inspired by the understanding that architecture has to be more than the projection of architectural objects or solutions in order to improve the quality of life of a community living in extremely poor conditions. These conditions in a city district of São Paulo, which was chosen for the project, were the results of a "large-scale peculiar 'imbalanced' urban development" (Price, 1984). In a society largely affected by poverty and imbalanced urban development, the quality of life is something related to conditions as fundamental as food supply, public security issues, health assistance, to name but a few. However, our experience shows that the expected external government intervention in these cases does not bring about the necessary changes to break established dysfunctional structures. The attitude of passively supporting difficult living conditions, found commonly in the local population, comes from a long-time colonial and populist heritage, fixed in a mentality based on colonization roots, by hoping that the "mother government" takes care of problems. How do we break these behavior roots? How do we motivate the population to change? How do we promote access and circulation of information, and how do we transform this into knowledge enabling people to act inside an unequal situation and promote tools for acting actively? By believing that information and the way of communication can alter perceptions of life situations radically, how do we give a voice to the inhabitants by implementing a collaborative communication network? How do we connect a society, which is a priori a "community without propinquity?" Which information and communication technologies should we choose based on low-cost and low-tech principles in order to ensure the system functions properly and that there is interaction and exchange in the community? Which educational and promoting objectives should we have and how do we stimulate the population to participate in activities related to improving local life qualities? Who should design the system and who should maintain it, after the research team retreats? Which methodological strategies and emergent concepts should be used? These are some of the questions which motivated the researchers to integrate the multidisciplinary project team.

2. Start: Online_communities

The district of Cidade Tiradentes has become a target of attention, from Sao Paulo local authorities since 2001, for presenting critical socio-economic conditions as one of the lowest Human Development Index in the city, interrupting a long-time absence and negligence of the local government in this part of the city, trying to get control again over a zone known for its high crime rates. The studies, which chose Cidade Tiradentes as a privileged area for intervention, highlighted its characteristic as an area in great need concerning three aspects: social issues, housing and urban matters (Usina, 2003). Chosen to house the first telecenter in Sao Paulo in 2001, Cidade Tiradentes occupies an area of 15 km^2 and has many social housing apartment blocks, which were mainly developed in the 1970s, when 40,000 units were gradually built by the government.

The estimated population living in the apartment blocks is about 150,000 people. Apart from the legal social housing blocks, slums and illegal squats are also found in the district inhabited by a population of an estimated 70,000 people. Cidade Tiradentes is also made up of huge empty areas in the middle of a built-up environment which are inappropriate for living and most of them are owned by the municipality. Located in the east of Sao Paulo, most of its population commutes daily to the central regions of the city. The area is even deprived of proper connections to mass transportation such as trains or the underground. On the other hand, positive aspects are that the district is located on the border of national parks, and that there is a large amount of inhabitants who have been there since the beginning with a real interest in obtaining better life conditions and building up their neighborhood. In Cidade Tiradentes, there is only one official job per 398 inhabitants. The situation of local unemployment is demonstrative and partly due to the planning of the district as a "dormitory-district." There are few industrial, commercial and service establishments and not even one bank branch there. Most of the jobs are done on an informal basis and governmental social programs only reach 20 percent of the population in terms of financial help. The network of health services is made up of four basic health centers, one emergency ward and 23 teams from the family health program. These figures (Figures 1-4) related to Cidade Tiradentes (Usina, 2003) show the selected city district and some strategies of the proposed project, reacting to the precariousness of the services offered to the population re-affirming the low quality of living standards in the area. It is worth mentioning that, there are hundreds of entities and associations and NGOs sponsor

Figure 1.

Figure 2.

Figure 3.

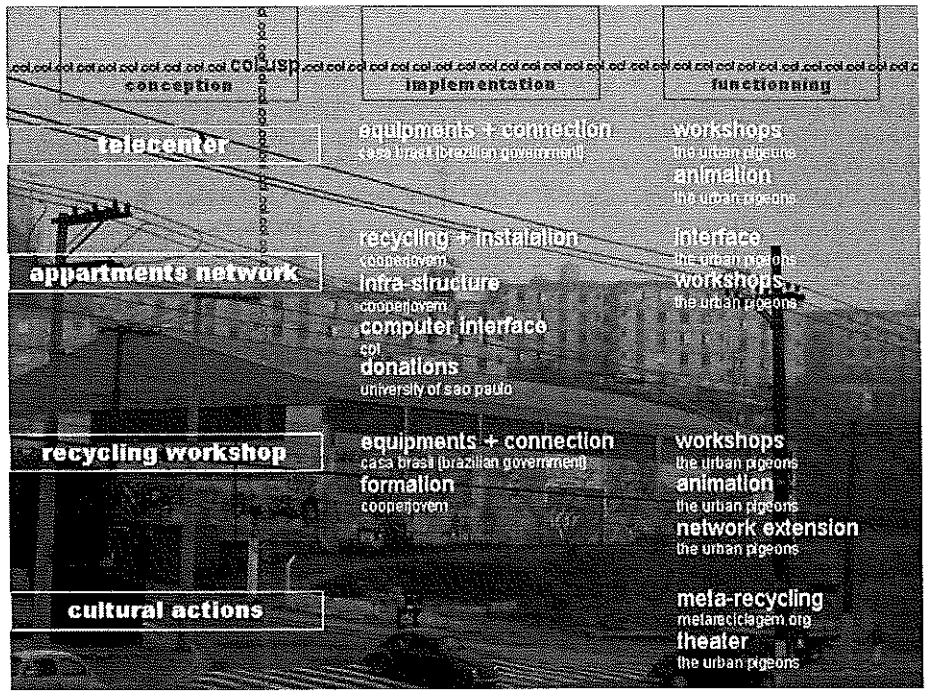

Figure 4.

many kinds of projects in the district, which attempt to minimize the absence of government support. Urban violence is part of the every-day life of the population.

The initial proposal of the project Online_communities in 2003, previewed the constitution of a local virtual community to counterbalance violent reality happening in concrete space, fostered by advanced ICT's. The aim of the project was to provide new possibilities to foster dialogue and debates, to broaden social interactions, to improve new services which were set up, and to encourage more income and cultural activities as well. It also intended to evaluate the effects of the technological mediation of social relationships, both inside and outside the community, as well as within the physical urban space such as in the housing inner space. The local communication network previewed initially a wireless system using the local telecenter as an internet provider. About 300 access points would have been available for free, using set-top boxes connected to television sets: 220 of them in apartments, 50 in small shops, and 30 in public services and NGOs in the neighborhood. High schools, a children's day-care, a small library, a family healthcare centre, football teams and various associations were listed among possible users. The software to be used had to be open source based, allowing its users to do experiments concerning design and content. Various examples of associative and collaborative interfaces were studied in order to set up a virtual place of communication which could be accessed by illiterate people. Among them, we can mention the excellent work of the MIT Sociable Media Group in the US, the V2's DataCloud versions in The Netherlands, the Electronic Shadows' I-skin in France and the SecondTime.zone project by Claire Petetin and Philippe Grégoire. The network

system to be designed was initially based on the use of mnemonic structuring and organization, a research we initiated during our PhD.

As mentioned before, among the various objectives of setting up a virtual community in Cidade Tiradentes, is the inclusion of people from this area in the telematics universe, making it possible to have new ways of sociability and community interaction. Furthermore, facilities and new tools are made available to these people and they can establish new forms of communication within the community. Ideally, the citizen who lives in Cidade Tiradentes will interact in a virtual environment not only as one who benefits but also as the author and contributor. Moreover, what we are looking for is a way to communicate and exchange information which may be impossible by other means and that could be useful on a personal basis in the field of communitarian action.

The structure, which is the anchor for this virtual community, is called "network." In this context, the proposed "network" intends to be the way in which both the concrete-and-virtual community of Cidade Tiradentes organizes itself and in which it is articulated. In spite of not fulfilling action research, the various aspects mentioned-above show that setting up virtual communities involves being concerned with distinct areas of knowledge, which are clear both in the multidisciplinary sense as well as the compatibility of procedures that it presupposes. These are, in short, the countless specifications which involve an experiment of this nature and that guide, step-by-step, its systemization and structuring (Tramontano and Santos, 2005).

Initially, the multidisciplinary team consisted of four research groups from the University of São Paulo: Intermidia, Nutau, LSI and Nomads.usp, and the participation of two main public partners: Sao Paulo Metropolitan Company for Housing and e-Gov Division. Currently, Sao Paulo Metropolitan Company for Housing, in partnership with Sao Paulo local government, (through its e-Gov Division) is constantly encouraging telecenters to be set up in the same areas as its housing complex estates. A desirable outcome of this research in terms of public policies would be to encourage telecenters to be set up and re-qualified to act as a server for the neighborhood to connect. However, apart from these aims, the objective of this policy is to plan and connect all the apartments, public services, shops and local associations using internet connection, becoming part of the priorities, such as water and electricity, of the future projects to be developed by Sao Paulo Metropolitan Company for Housing, and to transform the telecenters into informative and supportive facilities. The aim is that this practice of conceiving housing on large-scale involving equipment, services and space, on a concrete basis as well as in a virtual environment, can go towards establishing new standards of sociability. It is expected that the results of this research, on a broad scale, can be incorporated into the housing estates produced every year by the company, benefiting thousands of residents in Sao Paulo.

3. From top-down to bottom-up design strategies

It was not from the beginning of the project that we embraced social cybernetics as a possibility to improve organization for a system which was becoming increasingly complex. There is little proof of architects having used these methods in Brazil from the 1960s to nowadays, which does not mean that it is irrelevant. It was the constant revising of the research project, confronted by implementation reality and ongoing restrictions, as well as parallel research on complex theory and the use of diagrams in the design of complex systems, which introduced us to cybernetics. After having read

the book from Beer (1975): *Platform for Change* and learnt about the Cybersyn project in Chile, 1973, it became important to us to highlight the possibilities of using cybernetics as a design strategy in public policy for the specific situations which we encounter in South America and in Brazil.

The project Online_communities required a team of architects, designers, and computer scientists rethinking the way of intervening and projecting life facilities. In fact, there were initially no buildings previewed in the project, and no urban physical interventions. The design activity understood as architecture is the projection and implementation of a complex communication system in a mixed reality scenario, responsible also for proposing technological solutions to create a virtual collaborative network, and to support activities of interaction towards encouraging user participation. In the future, this system needs to be open and self-sufficient, independent from its designer team and able to evolve. The complexity forced us to leave behind the traditional role of the architect as top-down manager, and obliged us to work more effectively and in a more horizontal way (bottom-up) with the different people involved in the design process. Convinced that the "less is more" motto that typifies the most of contemporary designer creation is a false response to the growing complexity of our society, we argue that designers must be bold researchers, exploring new frontiers of interacting within a multidisciplinary realm, amplifying the understanding of what is design and proposing innovative solutions to different contemporary problems.

In the search for design criteria, we constantly need a method which promotes a predictive power to develop a self-organizing system of a reactive and adaptive environment, "with which the inhabitant cooperates and in which he can externalize his mental processes" (Pask, 1969). Based on the idea that:

> ... architects are first and foremost system designers, who have been forced, over the last 100 years or so, to take an increasing interest in the organizational [i.e. non-tangible] system properties of development, communication and control (Pask, 1969).

designers should be in fact qualified to design such systems, closely interacting with human beings and societies, and required, according to Pask, to be dynamic rather then static entities. Interaction, participation and understanding of the user constitute vital elements of the success of the proposal. Regarding the project in Cidade Tiradentes, what helped us design a complex system, was the understanding and interrelating of, as Edgar Morin points out: the "whole" with its "parts" the city governmental with the local, in a restless coming and going. As he explains:

> Consider a contemporary tapestry. It includes linen, silk, cotton, woolen yarns in a variety of colors. To know about this tapestry, it would be interesting to know the rules of fabrication and the principles governing each of these types of yarn. Nevertheless, the sum of the knowledge of each of the yarns used to fabricate this tapestry is insufficient, not only to know this new reality which is the fabric (that is, its qualities and the properties of each texture), but also to help us to know its form and its configuration. The first step of complexity: knowledge of the elements does not help us to recognize the properties of the whole. A banal statement which has not so banal consequences: the tapestry is more than the yarns which constitute it. A whole is more than the sum of the constituent parts. Second step: the fact that a tapestry exists means that this or that yarn cannot express itself fully. They are inhibited or virtualized. The whole is thus less than the sum of the parts. Third step: this presents a

> problem for our understanding and for our mental structure: the whole is simultaneously more and less than the sum of the parts (Morin, 1990).

The possible articulations between the whole and its parts seen in this example could be used, by analogy, to understand the practice of architecture as the relation between the design process, the system and its context (Ribeiro *et al.*, 2005). By accepting that the whole is simultaneously more and less than the sum of its parts, the design team needed to reconsider the dynamics of the design process, by moving from the "less is more" to a "more is more" attitude, including being multidisciplinary (and not only consulting) with other disciplines in the different parts of design involved.

"There is the discovery," Gregory Bateson writes, "that man is only a part of larger systems and that the part can never control the whole" (Bateson in Nichols, 1988). However, at the same time, the cybernetic dialogue may offer freedom from many of the apparent risks inherent to direct encounter; it also offers the illusion of control. This is especially interesting in the case of Cidade Tiradentes, where people, afraid of street violence, do not converse much, even with their neighbors. According to Nichols:

> ... the use of cybernetic systems give form, external expression, to processes of the mind (through messages-in-circuit) so that the very ground of social cohesion and consciousness becomes mediated through a computational apparatus. Cybernetic interaction achieves with another (an intelligent apparatus) the simulation of social process itself.

"But there is a risk," argues Jean Baudrillard, that: "Instead of facilitating communication, it (information, the message-in-circuit) exhausts itself in the staging of communication. This is the gigantic simulation process with which we are familiar" (Baudrillard in Nichols, 1988).

4. The relevance of cybernetics and system theory in complex design

Two projects by Cedric Price: Potteries Thinkbelt and Japnet, have aspects in common with Online_communities:

> ... [the] generic ideas about new ways of making environments responsive to the needs and desires of their users (Frazer in Hardingham and Price, 2003).

Both projects deal with information and communication. The former is done in a context of distributed learning and education facilities, as well as opportunities, whereas the latter (in collaboration with Gordon Pask) is a proposal for a communication network for Kawasaki, Japan. The English architect, Cedric Price used cybernetics as part of his design process as early as 1961, embarking on an enquiry into information technology, examining the relationships between location, communication and information. By integrating disciplines which were not traditionally parts of the process, the projects were conceived by considering the possibilities of activities and their pathways and the flexibility of movement to define the spatiality rather than a predefined program of functionalities.

Among the drawings produced by Price (1984) to explain the projects, what calls our attention are conceptual drawings and diagrams, indicating activities and flows related to architectural space, which are both flexible and changeable: "Standard forms, elevations and perspectives mean little in terms of Price's work: his plans are kits of parts and circuit diagrams, his details are catalogue specifications." By presenting a complete and conscious reversal of current procedure, he disposes of the

"traditional constraints of the pre-electric age and strips architecture down to a service with servicing. Problem solving within the context of user choice, the freedom from environmental constraints and the general improvement of life are his main concerns. In the case of Potteries Thinkbelt, various similarities to our project were observed from the beginning. Situated in the economically depressed English Midlands, in 1964 Cedric Price proposed higher educational facilities by proposing a rather unconventional network of learning facilities distributed over a 100 miles^2 along the railway, criticizing vehemently the centrality tendencies of the cherished establishment premises of higher education at that time. By decentralizing the facilities, the network would be "indeterminate, flexible and extendable, allowing the educational facilities to spread over and integrate into the area" (Price, 1984). He also relied on the stimulation and support of the local population, who were not directly involved in the institution, considering that:

> The housing of a major activity such as education should be viewed in architectural terms as a demand to increase the availability of such a service on a national scale, though its dispensation may through necessity require a limited locale [...] An activity that will increasingly occupy a large proportion of everyone's life should be in contact with areas near and far where the rest of life is to be spent. and he continues: Education, if it is to become a continuous human-servicing service run by the community, must be provided with the same lack of peculiarity as the supply of drinking water or free teeth (Price, 1984).

Like Price, we believe that the access to information and the promotion of conversation and as a result a better organization of activities and opportunities should be integrated into the part of basic supplies. What called our attention in this specific project was the physical context, which was similar to Cidade Tiradentes, as it was a decaying area. Price's proposal was a clear statement against the majority's opinion, suggesting a distributed education system to replace a traditional university campus. In Cidade Tiradentes, the ideas of technological decentralization and the reconfiguration of the use of systematically implemented Telecenters in São Paulo since 2001 as public spaces for interacting and communicating are going against the current common use of these facilities as supervised and restricted places of access to information. Similarities could also be traced by the proposal to distribute the facilities along railway tracks, which in the case of Cidade Tiradentes would mean a virtual distribution system, accessible by the individual dwellings, combined with Telecenters. Another aspect is a proposal to design an "operation system" which includes content, such as knowledge and teaching. As a result, an optimized system based on existing resources for a sustainable broad output and little investment is proposed. The tendency to create education facilities along the railway or subway is observed in several metropolises across the world, even in Brazil. However, in Brazil unlike inclusive proposals, they are just limited to commercial initiatives, profiting from the infrastructure. As being private, most of them are as exclusive and inaccessible as the cherished establishments, criticized by Price, far away from the innovative and inclusive educational scheme of the proposed Potteries Thinkbelt project.

Much later, in the early digital era, Price and Gordon Pask formulated a complex feedback system of communication and information for a city in Japan in the Japnet project (a competition for student housing in Kawasaki), introducing a:

> ... vast grid of spheres [as multidirectional receptors, receivers and transmitters of mixed-media], spread over the site and layered to form varying levels of exchange in the form of advanced information (Hardingham and Price, 2003).

Diagrams produced by Pask map the flow of information in the space and the representation of a concept. By using the idea of a village place as an intelligent plaza and making information exchange available in a socio-municipal level for random access and use, he introduces the role, as he calls:

> ... the invisible postman' underlining that the proposal of so-called fundamental elements, in combination with others "should represent the thoughts of the city and a computer-animated image of the built structure will evolve,"

producing an architecture of knowledge (Hardingham and Price, 2003).

Our techniques progressed, as well as our media. By using scientific organizational methods such as cybernetics in the architectural design process, we are only recovering what was lost sometime ago, replacing the once assumed truth of "less is more" by "more is more." This includes the comprehension of the potential of the computer as a medium to foster conversation:

> With the recent – and quite sudden – emergence of mass-appeal internet centered applications, it has become glaringly obvious that the computer is not the machine whose main purpose is to get a computing task done. The computer, with its attendant peripherals and networks, is a machine that provides new ways for people to communicate with other people (Winograd and Flores, 1986).

5. Re: vise Online_communities

> Dwelling is not sleeping on an immobile bed, but to live in a familiar environment. Home is not a fixed place, but the point of support trustworthy (Vilém Flusser).

The project is now in its third year and since the beginning it has seen a lot of changes. The two public government partners, Sao Paulo Metropolitan Housing Company and e-Gov Division were of little help for our proposal, because of political discrepancy and priorities. Today our main partner is a NGO called the Pombas Urbanas Institute, or in English: Urban Pigeons, founded initially by the theatre director Lino Rojas in 2002. Since, then its mission is, in the words of its coordinators:

> ... to develop activities in the social, artistic, educational, environmental and health prevention fields, together with low income communities, constructing the strength of local cultural identity and the understanding of the people about their needs and potentialities, to promote the growth of their human capacities and solve common problems in a collective way (Nomads.Usp, 2005).

There are many convergence points concerning the interests and objectives between the institute and the Online_communities project. First and foremost, both are researching a place to create strategies for social inclusion which not only focus on professional capacity and how to generate income, but also on the integrity of the person and their consciousness as a citizen and part of a larger collective. Their large physical space is integrated with a new telecenter, which has enabled us to look at the use of this facility as a place for organizing and capacitating its users for collective creativity. It will integrate the server of the "network" which will connect the

users of the physical space with its district neighbors, and then hopefully, with the community as a whole, its institutions and organizations, and parallel to the city, the country and the world. The team also recruited new specialists in order to organize activities in meta-recycling, which are the cooperatives: Cooper Jovem and Metareciclagem.org. They are responsible for promoting classes and professional ability in the use and conception of open source software and putting together of meta-recycled computers. This was a way of qualifying the local youngsters to include them in the process and to help make the network grow and give support to the community, as well as a way of creating local jobs. The concern for low cost and low tech made us change from our initially technological choice of set-top boxes to connect through televisions to meta-recycled computers, which were initially put together by obsolete computers donated by the University of Sao Paulo. We are currently testing the collaborative interface from the inhabitants' homes in co-operation with them, providing a meta-recycled computer and a commercial internet connection until the end of the project. The so-called focus group previews 100 apartments. At the same time, we are planning various activities with the Pombas Urbanas Institute and the population to encourage people to use the computer and understand the "network" as a meeting place for communication, education, and exchanging information and knowledge in a decentralized and recursive way. The hopes are that this initiative will not stop with the research, but that it will have the power to survive through its users, without the research team, and be a potential place to include the excluded.

6. Final considerations: cybernetics as a way of inclusion

The main contribution of cybernetics in the current stage of our project was that through systemic understanding we are now able to have an analytic view about what was done, and to revise all the work for the third stage of the project, which will start in May 2007. It is mainly due to the new partners taking part in the project and a synergic superposition of interests with the Pombas Urbanas Institute, from which derives the strength of the community to change its destiny. Questions concerning the viability, recursion and decentralization in relation to technological choices, infrastructure and the virtual network are central issues to ensure the participation of the inhabitants of this poor district.

The three levels of the project's preliminary conclusions are:

(1) The network must be designed as a very flexible structure which can be both altered and filled with personal or collective-created content. The use of free open source software gives the opportunity to make changes in collective workshops, and moreover it helps to develop professional capacities in computer programming.

(2) For the inhabitants, putting their own content online has a double goal: to transform users activities with media into a very personal experience which will become part of their narratives, and to foster their critical view about the information they generally encounter on the net.

(3) Equipment production, repairing and upgrading can be done by recycling obsolete computers, discarded by private enterprises and governmental divisions. Similarly to the activities of software programming, recycling can produce knowledge and bring funds to the community. As additional results, it

will make the users more familiar to the universe of computers by gathering people in technical workshops.

In order to stress the cultural aspect of these actions, it is desirable to have a local organization already established in the neighborhood to play the role of gatekeepers by housing the workshops physically and presenting collective activities. Non-governmental organizations, communal halls or public telecenters can extend their schedule with new organized activities, but they can also enrich the already planned ones.

The following results are expected to:

- adjust information for the community's practices and needs, and not the contrary;
- stimulate a new sociability among residents of a specific urban fragment, and also between them and internet users in general; and
- encourage individual behaviors of change by stimulating their participation in the community life by the recognition of oneself as a member of a collective body, and by the understanding that this collectivity is a part of the society.

Creativity in an uncommon combination of research, experimentation and practices, and an in-depth knowledge of the local culture will hopefully overcome organizational difficulties in order to ensure information as control, as Beer points it out in relation to the Cybersyn project (Beer, 1975). Control is understood here as a form of freedom to change structures and policies. Although these strategies are being experimented in a poor Brazilian community, their guiding principles refer as a critic to the actual individualistic use of the internet, which can be found in different social levels in different parts of the world.

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About the author

Anja Pratschke has lived in Brazil since 1991. She became an Architect DPLG at the *Ecole d'Architecture de Grenoble*, France and she did her Master's in architecture and PhD in Computer Science at the University of São Paulo. Since, 2001, she has worked as a Lecturer and full-time Researcher in the Department of Architecture and Urbanism at the University of São Paulo. She co-ordinates an education laboratory for computing and the research group Nomads (www.eesc.usp.br/nomads). Her research interests are in design of knowledge spaces, mixed reality applications, design and communication processes using mnemonics, cybernetics, system theory and complex theory. Anja Pratschke can be contacted at: pratschke@ sc.usp.br

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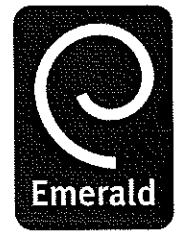

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