On the resilience of urban systems: should they be resilient and are they really systems?
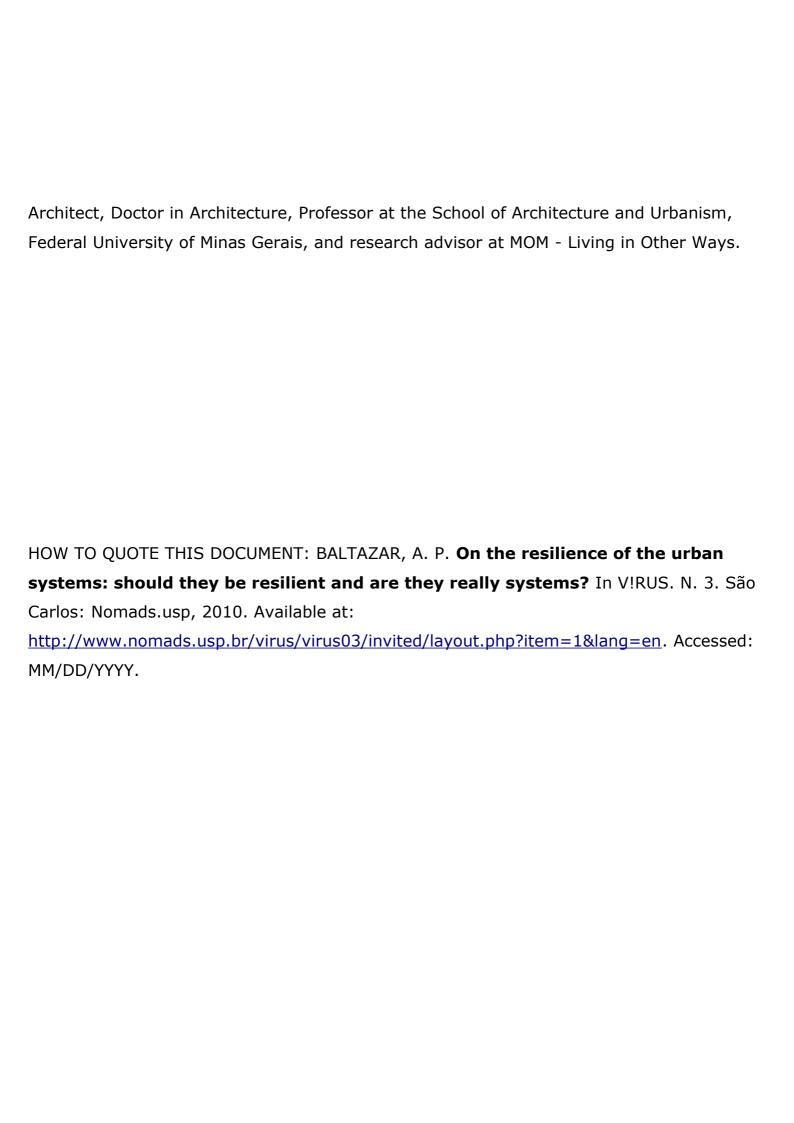
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1. Introducing the current praise of resilience in design and urban planning

No word is more up to date in current discussions of design and urban development, than resilience. For instance, John Thackara, the father of Doors of Perception Conferences and one of the leading figures in technological and sustainable design, has insistently announced resilience as the big issue for design in his famous monthly newsletters and his blog.[1]. In July 2008, his newsletter was entitled "Design for resilience", introducing the transition culture movement.[2] In October 2008 he mentioned it briefly, discussing complementary currencies as means to build resilience, encouraging the development of the local community.[3] Moreover, with his City Eco Lab project in St Etienne, he writes in December 2008, that 'the discovery, mapping and documentation of a territory's natural, cultural, human resources is a key element in building resilience'.[4]

However, it is just in 2009 that resilience becomes central to his discourse. In May 2009 he announced the new Aalto University to be opened in 2010, named after the Finish architect and designer Alvar Aalto.[5] Thackara dedicates an entire section of his article to resilience, stating that the Aalto University was challenged by an ethical commitment to the biosphere, implying a new focus, which is on resilience. He takes the definition of resilience from The Transition Handbook as "the capacity of a system to absorb disturbance, and reorganize, while undergoing change"[6], arguing that it "is also a more evocative and energising word than 'sustainability', which is such an unexciting destination".[7] In 2009 his newsletter's headlines included 'Design for resilience', and he introduced in June 2009 a new collection about transition and resilience,[8] in which he reinforced his focus on resilience instead of sustainability, this time resorting to the Mandarim term Fui So (the ability to rejuvenate) in contrast to the mere sense of being sustainable. From mid 2009 throughout 2010 Thackara has assumed that his newsletter "starts conversations on issues to do with design for resilience, and announces Doors of Perception events". As one of the most influential figures in the design field, ranging from graphic design to food design, to architecture and city development, Thackara's focus on resilience is certainly echoing all over the world.

What best illustrates the pervasiveness of "resilience" in the urban debate is the call for paper for the volume 17 of Critical Planning, a quite well known journal of the UCLA Department of Urban Planning.[9] The theme of the volume to be released in the summer 2010 is resilience, and according to the call for papers the terme derives from ecology:

'the concept of resilience is defined as the "measure of the persistence of

systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables" (HOLLING, 1973). A resilient system is formed by the dynamic interplay between deterministic forces and random events, structural factors and human agency, linear paths and contingency. Such heterogeneity and variability allow resilient systems to absorb unforeseen shocks, continually adapting and evolving so as to resist collapse'.[10]

If something might be said to be resilient, certainly this is capitalism, which has proven to resist crisis, as crisis is inherent to it. Differently from Karl Marx's hope that capitalism would collapse because it would certainly undergo crisis, it has proven to be resilient and managed to strengthen itself. In fact, as a mode of production capitalism has the ability to absorb crisis (change and disturbance) and maintain the social relations of production, to use Henri Lefebvre's term (LEFEBVRE, 1976 and 1991); that is, in Crawford Holling's words, to 'maintain the relationships between populations and state variables' (HOLLING, 1973), or in Humberto Maturana's and Francisco Varela's words, to maintain organisation despite changing structure (MATURANA and VARELA, 1980).

The fact that most urban environments in the world are ruled by capitalism does not mean that they need to be resilient. If they were, they would certainly maintain their relations of production (their organisation). But such relations are precisely those that need changing if we want a better and sustainable world. The main point of my argument is that since social relations are at stake there is no natural system at work to be resilient. In order to discuss this I will first address why design and urban environment should not be resilient and second why they need to be faced as open social relations rather than systems.

2. Why design and urban environment should not to be resilient

The first point I wish to make in this paper is that even if resilience is central to the agenda of design and urban planning nowadays, we might not forget that if taken seriously as an applied concept, it leads to the maintenance of the social relations of production, as resilience means the ability of the system to recover from change going back to its original shape. Such maintenance means not only stability of urban environment avoiding collapse, but the maintenance of economic growth, which is incompatible with environmental sustainability.

Lefebvre had already shown that space is not a consequence of capitalism but a controlling instrument to help capitalism work and keep the status quo; that is, to be resilient. Nineteenth century capitalism managed to shape space according to its own premises by planning it. This means that from the nineteenth century onward planned space has served

capitalist economy to control (by restriction) alternative modes of production and to survive crisis by being resilient, reproducing its very social mode of production. This has led to a sort of blind enthusiasm for growth, as capitalist production means economic growth. Such a capitalist growth, however, is an unsustainable malaise that must be at least debated. The mode of production of space has managed to barely escape capitalism and resilience in developing countries (mainly in favelas, squatters and other alternative settlements), but as it is done out of necessity and not by choice, the lack of awareness of such a process leads the products to be easily absorbed by capitalism and its logic of growth. In developed countries, though, capitalism and growth are already two unseparate entities hardly questioned, and the production of space, which is apparently organised and needs no change, serves precisely to keep growth steady, welcoming resilience. An alternative production of space would oppose resilience, as it is not intended as a mere means to improve favelas and alternative settlements, or even to improve the average production of space in Brazil and other developing countries. An alternative means to the capitalist production of space might be directed towards discussing the role of space in a possible new social arrangement. It might assume the need for a new social arrangement instead of being resilient. Such an arrangement should explicitly oppose growth towards true sustainability. Of course this would not be the solution to the problem, but a means to start worrying and problematising the capitalist logic of resilient planning for growth from the point of view of the production of space.

Nowadays a wide range of discourses on sustainability indicates 'controlled growth'. However, advocates of true sustainability—those putting resources and society, not economic growth first—are already discussing the need for degrowth (PARTICIPANTS IN THE CONFERENCE OF ECONOMIC DEGROWTH, 2008). The least radical approach is that of Albert Bartlett (n.d.) and David Harvey (n.d.), showing that the only sustainability possible is by at least stopping growth altogether, or zero growth. For Bartlett steady growth means exponential growth, and he shows that a 5% growth per year in the consumption of a natural resource means a growth factor of 32 in 70 years time, which means that in 70 years it will be necessary 32 times more of such resource than we have today. To illustrate his argument he describes the steady growth of bacteria in a bottle, doubling in number every minute. 'At 11:00 am there is one bacterium in the bottle. At 12:00 noon the bottle is full' (BARTLETT, PART 3/8). He then asks at what time the bottle was half full, and the answer is: one minute before 12:00. This shows that one minute before finishing the resources (the space), the bacteria apparently still had plenty of resources (space). However, as the so-called steady growth is exponential, like the bacteria, most people just cannot realise how unsustainable steady growth is. In a capitalist society a clever

bacterium would go out of the bottle at 11:59 to find more bottles. As Bartlett shows, even if this clever individual finds another 3 bottles, without breaking the steady growth rhythm, these would also be full in just two minutes past 12:00. This means that capitalism is unsustainable and as we run out of resources we also occupy every empty space left with ourselves and our products, including a huge amount of waste generated in our production.

The main problem with opposing growth, Bartlett shows, is that it is directly related to negative events, such as disease, pollution, small families, non-immigration, etc. All positive events, as motherhood, sanitation, health, immigration, etc., are attached to growth. It is quite hard to find a positive feature not related to growth in our capitalist society. Opposing growth also means opposing resilience, as we assume from the start that we do not want to maintain the relationships (social modes of production) as they are. This only makes sense if we pretend that the urban environment behaves as a biological system that needs to be resilient in order to absorb change and maintain itself as a 'system'.[11]

An alternative production of space might work on the positive side, without resilience and growth attached to it. Instead of privileging the capitalist logic of planning for growth and a resilient production of space dictated by capital and not by people directly interested, such an alternative might shift the focus to social engagement. This means that instead of corporate clients designing the city and dictating the production of space in a rather artificial manner, space should be produced by those directly interested. Nowadays, even participatory practices are directed by such a corporate planning logic. As Nabeel Hamdi (2006) shows, he is never approached by the community and his work has always to satisfy the client, the investor, the government or the NGO, before actually serving the community. The capitalist planning logic excludes spontaneous negotiation and any sort of production of space that is not directed towards benefiting or stimulating economic growth and envisages resilience for the maintenance of the status quo.

The main shift towards an alternative practice resisting resilience might be from focusing on exchange value to privilege use value in the production of space. Spaces might be designed and built not for profit but for use. This seems an obvious assertion, and one might argue that every space produced if not directed for use will never be profitable because people will never buy it. Nevertheless, this is not true. Most people buy what they can afford and adapt their needs to it. Need is socially constructed and not innate, otherwise we would only have shelters to protect us from the weather and eat anything

not to starve; there would be no city life, no technology, no arts. In a capitalist society 'need' has become more resilient and artificially constructed than ever: instead of springing from ordinary people's own developments and negotiations, it has been dictated by a few powerful people or corporations with a clear intention to increase their own profit and private capital by controlling and manipulating the masses. It is not by chance that in 1920s Edward Bernays, Sigmund Freud's nephew, coined the term 'public relations' (PR). It is a means to soften the manipulation of the masses by private developers' and public policies' imposing functions and authoritative goals (CURTIS, 2002, episode one). On top of the manipulative character of PR, the worse outcome of such a practice regards the artificialisation of demands for economic growth.

This is a serious issue nowadays, as we have entered a huge economic world crisis, and instead of questioning the greed for growth, the mood is that of resilience, fixing things by manipulating the masses into believing that the world is only in the right track when it is growing steady, and thus needs to get back to it.

The critique of the capitalist mode of planning is not only valid for developing countries, where the building industry is the most profitable ever in this period of crisis, but also, and mainly, for an established and unquestioned practice of production of space that disregards spontaneous subjective interests and the ability of people to negotiate space as they simultaneously design, build and use it. This latter process is established in most developed countries and despite its apparent success, needs questioning if we envisage a virtual, rhizomatic and sustainable production of space focusing on people's interest instead of economic growth.

The production of space in favelas shows some features of a possible non-capitalist approach but since it happens in a capitalist context of pervasive resilience it is easily swallowed by it. However, alternative practices might learn from favelas, mainly with their negotiating logic and the way problems are not solved and turned into greater obstacles but delimitated in an intersubjective manner, as Vilém Flusser (1999) puts it.

An interesting case of a favela woman deserves noticing. Carolina Maria de Jesus has published a diary narrating all the misery she went through with her children in a favela in Brazil. *Quarto de despejo: diário de uma favelada* (1960) or Child of the dark, was translated into thirteen languages becoming a bestseller in America and Europe. She got plenty of money with the success of her book and managed to buy the house of bricks and mortar she had always dreamed of as a solution to all her problems. For those who read

her book, sharing all the misery she depicts, it feels like a problem-solved. But her story does not end there. She wrote another book, *Casa de alvenaria: diário de uma ex-favelada* (1961) or I'm going to have a little house, which has not become so famous, describing the problems in her new life. In the end of the day, her problems never ceased but have only changed complexity. Instead of having to worry with what to eat everyday, she had to worry with less immediate things. She concluded that misery also exists in different disguises. The fact is that Carolina's problem was not only the immediate misery that led herself and her children to starvation several times. Her problem should be looked at in a broader context, as a problem of race, class and gender in a capitalist developing country. In the end, it can all be summarised as a collective problem of exclusion, heteronomy and reproduction of the social relations of production in a world of resilience, which needs a thorough critique instead of poor attempts of solution. Carolina's case shows that even if the problem of physical misery is apparently solved by getting some money and moving away from the favela into the legal city, the socio-economic problem gets even bigger when it is not brought into discussion. Carolina's new house did not change her social misery. If a particular space is produced as a finished product without a thorough discussion of the social process of production of the very space and its context, it becomes a mere solution to immediate problems, adding one more obstacle to overcome. Carolina's example shows the failure of resilience as she only envisaged change within the same 'system' she was part of, without realizing that in order to really change her life she would need to change the very 'system'.

It must be clear that I am not romanticising, and even less making apology of the ethic and aesthetic of favelas. I have just unheard of a better example of negotiation and of unseparate stages of design, building and use in the production of space. These two features are pervasive in every production of space in favelas, even in the most distinct ones. Lícia Valladares (2004) provides a helpful reference to not fall into a very usual process of romanticising favelas. She advocates that scholars are usually trapped by one or more of three dogmas when approaching favelas (VALLADARES, 2004, 124–27). In her view, to escape the dogmas it is important not to marginalise the dwellers (not everyone is involved with traffic of drugs or are poor unprotected fragile people), not to homogenise the diversity of small groups and different favelas, and not to attribute a single and strong identity to favelas, because they are all different, although they have in common that which Hamdi (2006) calls the slime mould behaviour.

The internationally famous movies City of God, from the directors Fernando Meirelles and Kátia Lund, Brazil, 2002, and Slumdog millionaire, from the directors Danny Boyle and

Loveleen Tandan, India, 2008, slide into such a dogmatic scholar view criticised by Valladares. Even if showing a distinct picture than that usually imagined by the audience, they play with extremes and instead of putting problems in evidence they crystallise them as resiliently unsolvable. For instance, the main taglines of City of God are:[12]

> If you run you're dead.... If you stay, you're dead again. Period.
> If you run they'll catch you. If you stay they'll eat you.
> Fight and you'll never survive.... Run and you'll never escape.
> If you run it will get you. If you stay it will eat you.

Despite their audience appeal and success in the Academy Awards, these are not good pictures of the social production of space in favelas, shantytowns or slums.

On the other hand, the paternalistic view of the Brazilian government, for instance, does not provide a good picture either. When Brazil's president Luiz Inácio Lula da Silva started his first mandate, the government set a strong social policy to extinguish misery, which included a paternalistic (but then necessary) campaign against starvation and a campaign for city rights attending the demand of self-organised social movements. The latter came to consolidate the relative democratisation of the country after the end of military dictatorship in 1985. The Federal Constitution of 1988 already included general principles for a more equalitarian society, in which Municipalities are declared part of the Federation, with autonomy to create their own organic law. Such autonomy was reinforced in 2001 by the City Statute (Federal Law 10257/2001), emphasising the social function of the urban property and the need for participatory processes, setting instruments of urban policy to be implemented in every city. This was celebrated by the social movements as the government proposed a range of programmes that could be implemented by the Municipality alone or in partnership with the State and/or the Federal Government. Some of these programmes could even be accessed directly by civil organizations.

However, what had started as a strongly socially-based government was little by little giving place to capitalist drives culminating with a couple of paternalistic programmes to accelerate growth (called PAC) and to provide housing for the homeless (called *Minha casa, minha vida* / My house, my life). Both programmes are massively applied everywhere in Brazil, take the great majority of the government budget and prescribe very poor conditions of living for people. It is enough to say that the housing programme started by setting three types (plans) concerned with the family's income, completely neglecting regional diversities and the families' actual needs. In sum, despite the investment and mobilisation triggered by these programmes, they are not means towards actual social change. They reproduce the social relations of production, keeping the socio-

economic gap as it is.

Of course that a self-organised programme takes longer and builds less houses during the four years government period, but I have no doubt that people are much more satisfied and appropriate of the space in a much more useful manner than the ones provided with mass housing as a problem-solving means. We already have indication that most people are registering in the new programme to get the house as a good to exchange and not as a place for living/using.

As the government proposes such massive programmes, it stimulates people not to self-organise themselves and not to negotiate, needless to say that it also prescribes finished products that cannot be changed—they are mostly built with load baring walls—separating the stages of design, building and use. This means giving up any possibility of real change in the social processes of heteronomous production, maintaining the capitalist mode of production of space. Resilience plays a central role in such a process as it is designed to keep things as they are. An interesting case with which our research group MOM (*Morar de Outras Maneiras* / Living in Other Ways)[13] was recently involved illustrates why resilient approaches are not welcome. It is the case of the Specific Global Plan (*Plano Global Específico* or PGE) at the favela Morro das Pedras in Belo Horizonte.

Belo Horizonte is perhaps the first big city in Brazil that implemented the participatory budget (*Orçamento Participativo* or OP), which happened under the Labour Party Mayor Patrus Ananias (1993–1996) and as a consequence of it implemented the PGE. At first OP was a means to allocate a small part of the municipal budget to structural inteventions proposed and chosen by the public. With time, it was expected that OP would become a means towards shared city government, in which all citizens would be able to take part in the government decisions. Nevertheless, this never happened, and even if the first OP assemblies were very successful in creating a public space for setting priorities and negotiating demands, on the other hand, the structural interventions proposed ended up as short term palliations: it was worthless, for instance, to pave an alley at the bottom of a hill without properly treating its top and taking care of the whole sanitation structure.

The PGE methodology was formulated by Urbel (responsible for the urbanisation of favelas in Belo Horizonte) as a means towards a systemic view to make the OP viable. It evolved into a planning procedure to systematise directives for each favela. It is supposed to embrace physical-environmental, legal and social questions, and to be developed in a participatory process of data gathering, diagnosis, and proposition of directives. It was

legally institutionalised in 1996 and became a prior condition for any 'structural intervention' in favelas (KAPP and BALTAZAR, 2010). The first major intervention of PGE happened at Aglomerado da Serra, one of the biggest favelas in Belo Horizonte. Set to become a model, the government was very careful and used several participatory strategies (all placating) to guarantee the works. At Morro das Pedras, a favela located at the heart of the city and almost as big as Aglomerado da Serra, the government was not as careful as before, which has caused great dissatisfaction and triggered self-organisation of the community against the works.

Morro das Pedras is composed of seven different villas joined together and limited by two major roads and different middle-class suburbs. The main directive of PGE that the contractors are willing to address is the improvement of car access, or in other words, the building of roads. Of course that most of the dwellers have no car but could benefit of a better access to their houses. However, the proposed intervention, which was actually hired by the government, will spend most of the budget assigned to the implementation of PGE in these villas, to open two-way roads connecting the other two major roads that limit the villas. In fact, it will be of much more benefit for the city traffic than for the improvement or development of this favela and its community.

As the government is not taking too much care of community (placatory) participation in this project, so are not the contractors. Their first action was to plan the road completely neglecting the actual needs of the community and, worse, without discussing with the community the placing of the road and the houses that would be removed for that. As they have started the works, their first action was to mark with painted numbers the facades of the houses to be removed without any explanation. For instance, this became known in the community as a Nazi strategy. As soon as the first houses were removed, and the dwellers practically ousted from their houses (and from the villa, as the money they get is not enough to afford anything in the region), the community articulated itself and started questioning the lack of respect with some people that lived there for more than 50 years, the road project, the PGE and the governmental intervention without any actual participation of the community. This self-organised group is now fighting to revert the situation and to plan and execute themselves a much more modest improvement in their villa. Instead of being resilient and accommodating changes keeping the relationships of the favela with the city, this group have started to become aware of the need to actually be able to change the relationship of the favela with the city.

As the self-organised movement in Morro das Pedras is growing, mainly in Vila das

Antenas (where it started), they are also getting more able to realise and discuss what they have already done in their villa: their practice based on negotiation and the ordinary everyday production of space simultaneous with its use. They argue that if they were able to build all that which is there, why will they need external intervention to structure their living space? Why money can only be invested in large amounts and when it is profitable for external contractors instead of constantly invested for the actual minor improvements needed? The answer is that the government has trapped itself into the resilient capitalist logic of producing space and on top of that puts gentrification as its main goal. The resilient couple capitalism-gentrification means that all improvements might be profitable and heteronomous (not autonomous), and that such improvements might conform to middle-class taste. The social drive of Lula's government is totally lost in the recent programmes proposed but as it gets to such an extreme, as the case of Morro das Pedras, placation is no longer accepted and the community becomes able to evaluate its own practices in contrast to the heteronomous ones imposed on them, resisting resilience.

This community indicates that the sustainable aspects of the production of space in favelas are related to social negotiation and the joint process of design, building and use. Use value is the only focus when producing the space, not exchange value; although this does not exclude the possibility of future exchange. These very simple principles might be enough to hold the community together and keep their values while improving their living space by means of actually changing the relations of production. It is my belief that traditional practices might also learn from favelas and resort to negotiation and flexibility in the production of space. Instead of producing finished and resilient spaces we might propose interfaces with which people might engage in temporary appropriations of spaces heading towards actual change, leading to sustainability and perhaps even degrowth.

The only way resilience might be welcome is when looked at as the strength of character of individuals and small groups to keep their say (eventually becoming autonomous) in the production of space. As shown above, resilience is of no benefit as a feature of planned urban life looked at as a 'system' that recovers quickly from crisis going back to its original state. This leads to my second point, which is the critique of the urban environment as a system.

3. Why urban environment is not a system

The second point I wish to address is that of the city seen as a system (a urban system). Mark Gottdiener (1993, 57–60) shows that several authors have already argued against

such a perspective and the main point I would like to stress here is that of James Anderson (1973), who asserts that the main failure of approaching the city as a system is that it becomes an example of spatial fetishism. Similar to Marx's assertion on the fetishism of commodity, for which relations that are in fact between people are mistaken by relations between things (MARX, 1887), Anderson (1973) argues that by taking the city as a system, the social relations between groups or classes are presented as relations between areas, obliterating the social divisions within the areas. For the discussion proposed here the main problem with taking the 'urban' as a system is that it affects both urban analysis and planning. This means that everything that might be grasped and reified by means of analysis becomes all that is used in planning. With the spatial fetishism the analysis is easily limited to relations between areas ignoring the social relations between groups and classes. If any planning is done under such fetishism it will certainly tend to solve superficial spatial problems, reinforcing the prevailing logic of production of space. As I advocate the possibility of working with a constellation of dynamic social relations (qualitative) instead of working with known data (quantifiable or reifiable), it is crucial to discuss the limit of the systemic view applied to the environment and its production.

In a broader sense, as Ludwig von Bertalanffy (1968) argues, a general theory of systems would deal not only with elements but also with their interrelations. He is talking about biological systems in the same way as he talks about social systems. If on the one hand I agree that a biological entity might be examined in itself as a system in which all parts might be analysed in their relationships to each other, on the other hand, I cannot accept that the city is a system that might be analysed and designed under these same premises. A human body, for instance, has a limited number of organs that are supposed to work in accordance with each other. If such a body is ill due to an external affection we expect that it will respond, as a resilient system it is, recovering quickly back to its original estate. A city, on the other side, has no limited number of organs working in relation to each other. It is made of indeterminate organs, such as social relations and space, and it is not resilient in principle. What gives the impression that the city is a system, a closed determined body, is the fact that most times space is produced under heteronomous rules merely reproducing the social relations of production.

In order to distinguish a biological system from the city I resort to autopoiesis as defined by Maturana and Varela (1980). An autopoietic system is a living-system, such as the human body and any other biological system. Moreover, Maturana and Varela (n.d.) establish as the first of six steps to identify whether or not a system is autopoietic that such a system must have an identifiable boundary. Maturana (n.d.) uses the example of a

cell to describe an autopoietic organisation as that of an independent physical unity, separate from its background, and produced by processes intrinsic in its own operation. In other words, a cell is an independent living-system with a clear identifiable boundary. Such a system is ideally resilient as it has all possible output created from its own input. All one can expect is that a cell will not change into something else, but be able to interact with other cells as to grow into what it is programmed to become. That is, it keeps its structure and organisation and grows under control.

If looked at as a social phenomenon, the urban environment, on the contrary, has no identifiable boundary, frustrating the first rule of autopoietic systems. For Maturana (MATURANA and POERKSEN, 2004) social phenomena cannot be reduced to an autopoietic system. He argues that

> 'autopoiesis takes place in a domain in which the interactions of the elements constituting it bring forth elements of the same kind.... Communications, however, presuppose human beings that communicate. Communications can only produce communications with the help of human beings.' (MATURANA and POERKSEN, 2004).

Following his line of reasoning he completes that 'autopoiesis as a biological phenomenon involves a network of molecules that produces molecules' and to replace molecules by communications would mean to say that communications produce communications, excluding people from the system. This closed system is an impossibility for social phenomena, which have no identifiable boundaries as a molecular system has (BALTAZAR, 2007).

Another interesting feature of the city as a social phenomenon is that it does not necessarily have fixed structure and organisation. Maturana and Varela (1980) state that 'the relations that define a machine as a unity, and determine the dynamics of interactions and transformations which it may undergo as such a unity, constitute the organization of the machine. The actual relations which hold among the components which integrate a concrete machine in a given space, constitute its structure'. An autopoietic system might have a changeable structure, but it necessarily has fixed-organisation; if its organisation changes the system collapses (MATURANA and POERKSEN, 2004). Maturana and Varela (1980) illustrate that with the toilet. Regardless of the materials used to make the parts of a toilet, it will still be a toilet if is organised as one. Changing materials means changing structure, not changing organisation. Structural changes might not be enough to change the organisation of a system, though it might be so radical as to change it. Of course that spaces, such as the toilet, will always keep its basic organisation, even with different

structures.

If taken as a system, organised and resilient, the city would never accommodate different organisations, though it would welcome structural changes. This means that the structure, the physical components and their interrelations might change, but not its organisation, the social relations. The class struggle would never cease, though the actors and the stage might change. The example of Carolina Maria de Jesus illustrates this. There was a great structural change in her life, which she believed was all she needed. She bought a new house and moved away from the slum into the legal city. Nevertheless, the lack of organisational change only made it harder to deal with the disguised misery in the changed structure. She was not prepared to cope with the implications of her new life, such as dealing with money in a bank account, booking a trip or having a maid. She saw the world as a system in which the access to money would enable her to have a new status, but this was not the case. What she needed most was in fact a change in organisation, not a change in structure. She was not aware of the benefits of her daily production of space, or her daily negotiation with her neighbours, and not even of the solidarity of her children in her old life. The first step towards a change in organisation would be to awake such an awareness. From that she would be able to actually start new relations of production instead of reproducing old ones she had no access before but that humiliated her.

An example that illustrates this in the realm of design (before going back to the city) is the Frankfurt kitchen, designed by Margarete Schütte-Lihotzky in 1926. Her motivation was to change the kitchen as to reduce the space needed and rationalise it towards optimizing its efficient use for women. However, as she looked at the kitchen as a system and only took into account the structural change, she arrived at an economic and rational small space in which the women would still spend a lot of their time apart from the family's everyday life. She never proposed an organisational change: the Frankfurt kitchen is still a kitchen, and a small one. A change in organisation would mean to look at the kitchen not as a system but as part of a chain of relations of the everyday life of a family. It implies ignoring boundaries that are taken for granted and thinking about changing relations instead of changing given structures.

The city is not much different from the kitchen. If taken as a system it might be said to have clear boundaries and be resilient, only accommodating structural changes without collapsing. This is the way cities are usually analysed and planned, by means of their structures. However, as a social phenomenon the city has no clear boundaries and might

change its organisation without fearing the announced collapse. The city needs not to keep its organisation; that is, it is not required to be (and actually it is not desirable that it be) predefined, having all possible dynamics of interactions and transformations predetermined. I would never say that such a dynamic place is in collapse, as the advocates of the city as an organised system with clear boundaries would inevitably arrive, but that it is a successful open structure with an open organisation. The main problem is that we usually design cities as closed systems, and the products of such a design process are not open to accept changes in organisation. Thus, instead of facilitating people's engagement in social transformation, cities tend to reinforce the systemic logic and encourage resilience.

4. Changing organisation by means of digital inclusion

An alternative to such a design process directed towards a resilient system is to focus on designing communication spaces. That is, designing interfaces with which people might engage to change the organisation of the city, not only its structure. In order to understand how such interfaces might change the social relations of production I draw from the example of *Ocupar espaços* (Occupying spaces), a partnership I have established in 2006 between LAGEAR (*Laboratório Gráfico para Experimentação Arquitetônica /* Graphics Laboratory for Architectural Experience) and the NGO *Oficina de Imagens*, connecting two favelas in Belo Horizonte. It used physical space and its structure but moved beyond this by taking advantage of information and communication technology (ICT). As a Digital TENT (Technological Environment for Negotiated Topology), it played with the flexible, mobile, low-tech and low-cost immersive environment as opposed to the fixed and expensive Cave Automatic Virtual Environment (CAVE) (BALTAZAR DOS SANTOS and CABRAL FILHO, 2006, 346–349).

Before getting into the description of the event *Ocupar espaços*, lets first explain in general terms the main difference between the TENT and the CAVE and the TENT's main premises (BALTAZAR DOS SANTOS and CABRAL FILHO, 2006, 346–349). Flusser states that the cave, from which the house derives, is a dark secret, a place where things are possessed, while the tent 'is a place where people assemble and disperse' (FLUSSER, 1999, 57), where things are experienced. The cave with its solid walls deals with gravity while the tent is a flexible structure, a means 'to think more immaterially' (FLUSSER, 1999, 56). The adaptive feature and the idea to use the tent not only to reproduce the material qualities of the shelter has certainly inspired us to develop the Digital TENT. Besides that, the CAVE is tied to a fixed organisation while the TENT enables both structural and organisational

flexibility.

Unlike the CAVE, a self-contained technological room within another room, the TENT aims to change the environment wherever it is. A hybrid of physical and digital features, it is a responsive system from which a third space emerges. While the CAVE combines sophisticated hardware and software specifically developed for its configuration, the TENT is a combination of commercial off-the-shelf hardware and software, such as desktop computers, notebooks, multimedia projectors, digital cameras, multimedia and movement-capture software.

They also approach images differently. In the CAVE images are mere representations based on the idea of truth by correspondence, while in the TENT images generate a third space, triggering new relationships between people and the physical environment, in which representation is based on the principle of truth by disclosure, escaping the logic of representation (COYNE, 1995). In the TENT people are essential for the temporary completion of the environment, which makes its organisation change and not only its structure.

Wiener (1954, 14) believes that messages and communication facilities play an ever-increasing part in the development of society. So, communication must be seen as the main condition for the production of space. Communication interfaces, the spaces of communication, are not usually designed as 'places'. The telephone, for example, enables communication but at the same time emphasises the placelessness of the meeting. Two people communicating by phone stay in their separate places. Even a visual connection is not enough to provide a place-like feeling, or to make people feel they share a space. John Perry Barlow (1994) recalls meeting Ranjit Makkuni, a Hindu, at Xerox PARC at the beginning of the 1990s:

> "Ranjit Makkuni ... was in charge of creating their video conferencing room. There was one room in Palo Alto and another in Portland ... so electronically mapped into one another that you can essentially locate others in the distant room in virtual relation to yourself. You could see their body language and you could hear them speak with great clarity. It's a lot like being there. And I said, Ranjit, does this actually work? And he said, Oh no. And I said Why not? What's missing? Oh, he said, the *prana* is missing. Well, *prana* is the Hindu word for both breath and spirit. I think the central question ... is whether or not prana can fit through a wire."

What Makkuni calls prana might be associated with the western idea of belonging, discussed by Christopher Alexander (1994). Like the telephone, a visual connection is not

enough. To belong somewhere people need to be engaged in creating the situation, something only possible through direct experience of physical spaces. Visual images might provide the feeling of belonging only if people engage with them. So the TENT uses not realistic representations but images as disclosing interfaces to enable people to engage in creating the temporary space that emerges from their interaction.

Ocupar espaços was one in a series of experimental projects with the TENT, trying to spatialise information and, mainly, create a shared 'third place' for communication. It used basic Internet connection and software to enable socially excluded people from two remote favelas in Belo Horizonte to establish relationships by means of a hybrid of physical and digital spaces, a virtual third space for remote communication that only emerged in present-time when people interacted with each other through the digital interfaces. The Internet, web cameras and a set of projected collaborative interactive interfaces, enabled people to interact with each other and with the environment by gesturing with different coloured lights in their hands. Some interfaces were puzzle-based, requiring two users to collaborate in order to move the pieces to form an image, while others, such as the 'digital graffiti', allowed people to create more freely what they wanted.[14]

The temporary third space that emerged from people's interaction with a hybrid of images and physical space was a place of dialogue, enabling immediate engagement with the situation and thus a feeling of belonging. Ocupar espaços showed that images do not need to be programmed to respond to actions in order to make people interact with them. Its participants interacted much more with pre-recorded moving images than with the sophisticated interactive images we had programmed. The pre-recorded images were thought of as interfaces, open to unanticipated interactions. They reproduced familiar scenes of the two favelas, such as of a boy playing football overlapping with an image of a pond with ducks which was projected onto the floor, and of a woman sitting on a bench overlapping with an image of children going down a slider projected onto a slope.

Bodily engagement with the images was encouraged because people and things were projected at full size or bigger. People, especially children, could not stop playing with these images. In the pictures of the event, it is hard to distinguish the children on the slider, a projected image, from the children climbing the slope and playing with the image.

Ocupar espaços proved that people have more interest in images that establish a direct relation with them. This might be achieved by including their own projected images in the environment where they are interacting, by enabling them to respond to the hybrid

environment, or by allowing them to interact with other people in unusual ways. Most important is to create images or structures for interaction which spatialises the unexpected communication in a third space which only emerges as a place when people interact with the interfaces. In other words, people need to be able to take part in the organisation, changing the relations of production, and not only effect structural changes by choosing one in a set of predetermined options.

The main lesson for us with this experiment regards the opening of a discussion on globalisation and digital inclusion which needs to be directly related to people's engagement in their social production of space. Contrary to most beliefs concerning traditional digital inclusion of poor communities—digital literacy and use of personal computers—and also contrary to usual discourses on poor communities exclusion of globalisation and the need of inclusion, I came to realise that the problem is not as clear as it seems at first. I will now resort to three main sources (Lícia Valladares and her 'Favela.com', Doreen Massey and her 'Is the world really shrinking?' and Sugata Mitra and his 'India, the Internet and non-invasive education') together with my own experiment with the TENT described above, to develop my argument.

On the one hand Valladares (2004) questions the usual view of globalisation seen as a process that marginalises poor communities in the cities of developing countries in Latin America, arguing that in fact these communities are not excluded, though their inclusion is not what one might characterise as 'usual' (VALLADARES, 2004, 121–136). She gives as an example the advertisement of the site www.rocinha.com, placed at the top of a five-storey building, which can be seen by anyone going to Rio de Janeiro's city centre. This site not only puts Favela da Rocinha and its community in contact with the city by offering tours, accommodation for tourists, historic and everyday information on the favela in Portuguese, with extracts also in Spanish and English, but also mobilises the internal economy of the favela. It is curious to note that the site is an initiative of a local cable TV, which also puts the community in contact with the globalised world by offering access to the Internet through the portal www.rocinha.com acquired together with a very cheap cable TV subscription. A range of economic activities springs from such articulation of technology. 'Favela.com' is not a privilege of Rocinha, but, as Valladares argues, such globalisation and inclusion of favelas in the economic and commercial circuits of legal Brazilian cities is pervasive, though each case has its peculiarities which might not be generalised (VALLADARES, 2004, 122 and 124–127). For instance, Rocinha's McDonald's is one of the most profitable in Rio de Janeiro.

On the other hand, Massey (2006) argues that the idea of a globalised society in which technology annihilates distances is becoming a myth and depends on who you are. She talks about an island in the middle of the Pacific Ocean which though located in the most prominent economic route, between the Americas and Asia, has its communities gone into increased isolation due to the very increase in linkage and connection across the ocean by means of air travel. Similarly, in a more familiar everyday situation, the fast trains do not stop in intermediate stations anymore, taking longer to go to short distances. Following Massey's line of reasoning we may say that globalisation works to reinforce already established connections but not in favour of fragile situations. Massey insists that social and cultural differences are not globaliseable. No matter how global we are, these will not stop being a question of space (and of geography in Massey's words). Looking at the favelas in the light of Massey's discourse we realise that even the economic inclusion that is certainly happening is impregnated with peculiar singularities in each specific cultural and social context. It cannot be globalised in order to be understood.

Some people disagree with that and believe in a globally framed problem with a possible global solution. This seems to be the case of Mitra (2000), who proposed many educational experiments with children using computers, the most well known being the original Kalkaji experiment, also known as the 'hole in the wall', designed to check whether or not potential users in India would actually use PC based outdoor Internet kiosk without any instruction and if it could be left without any supervision. The experiment proposed a hole in the wall of Mitra's office in which a computer screen was placed facing the outside with access to the Internet by means of a touchpad. It sounded like a good experiment and I was looking forward to hear more on it. Nevertheless, when I attended Mitra's lecture in Amsterdam at the Doors of Perception 6 Conference in 2000, I did not hear what I expected about the experiment itself but a lot about its 'non-invasive' character, its general outcomes and about what I understood as a simplistic way of framing the problem:

> "21st century society is characterised by speed, change and material aspiration. Families are small, solitary and very mobile. Marriage, as a social contract, is fast losing its meaning and relevance. Children spend a lot of time on their own. They often grow up with single parents. The concept of permanence is very different today than it was even fifty years ago. Children expect change all the time. They are also aware of the fact that everything can change, including their parents, their home, their school and their friends. They are often solitary and non-communicative. They have few friends although many can be aggressively extroverted. Since they expect rapid change, they see very little relevance in retaining anything, including knowledge (MITRA, 2000)."

Hearing or reading it fast one tends to completely agree with Mitra's assertion. Nevertheless, it is not as simple as that, at least in Brazil (and I believe also in India). One cannot infer any socio-cultural difference, subtlety or peculiarity in his assertion. It is so generic that we tend to agree. Regardless of most of it being true or not for children in some places in the world, the last sentence is the one that needs attention. He proposes a sort of syllogism between 'one expects rapid change' and 'one sees no relevance in retaining anything'. However, there is a missing link to make the syllogism work; it lacks an explanation. We could argue the opposite: that people who expect rapid change tend to retain a lot of things because they are afraid of losing their memories. It might sound sheer language preciosity, but in fact it demonstrates the rapid analysis and framing of the problem as global, which I am arguing against with the help of Valladares and Massey as described above.

Unfortunately, most of what has been done in Brazil towards the so-called digital inclusion departs from similar simplistic framing of problems ignoring the socio-cultural diversity intrinsic in each community, small group and individual. According to Rodrigo Assumpção, responsible for advising the Brazilian government on digital inclusion, in the end of 2007 '59% of Brazilians have never accessed the Internet or used a computer' (BRIDGING, 2008).

However, one must not forget that most people living in favelas have at least one mobile phone, sometimes even more than two chips and phones. For instance, Valladares (2004, 122) says that Rocinha has three mobile phone shops selling brands such as Nokia. It is not as simple as counting people not using Internet and computers to identify the digital divide; it is neither possible to ignore that it exists. However, by saying that people are not digitally excluded in the sense that the government insists in conveying in mass media might do more harm than good. One must be careful not to lead the government to withdraw a possible investment. But the path for identifying the divide, which is more socio-cultural than digital, and to deal with it, might be related to people's autonomy in the production of their space and not with providing each illiterate individual with a personal computer, which was mentioned as the Brazilian's government strategy in the BBC Digital Planet, though up to now with no sign of such accomplishment (BRIDGING, 2008).

A series of workshops I have done with illiterate people has shown that any illiterate person is able to learn very quickly to operate a computer. The problem is that most of the people with which I worked in the digital inclusion workshops had nothing in mind to do with a computer in the future. On the other hand, the experiments with the TENT showed

that even if people have nothing in mind to do specifically with a personal computer and the Internet, they certainly grasped the potential of ICT for their autonomous actions on space: on collaboratively creating a space as they occupy it using digital technology. This understanding is the most precious digital inclusion we could envisage if we take into account the relevance of socio-cultural differences and their spatial or geographical locations.

Of course that I am not against all children having their personal computers provided by the State. However, this instrumentality alone is not enough to trigger a socio-cultural and digital inclusion. A serious project of digital inclusion in Brazil would depart from understanding what sort of socio-cultural inclusion is demanded by the citizens without imposing on them the preconceived wishes and desires of those formatting the project, usually from the dominant class. The experiment with the Digital TENT as described above was quite revealing of a range of socio-cultural issues that are completely neglected in global problem-solving strategies. For instance, several public spaces in the favelas located in areas near middle class suburbs have a sort of hidden agreement regarding a schedule of use by different groups. I find it much more important than to teach individuals to use computers and create Telecentres (sort of Internet cafes), to work with the potential of ICT to create a social interactive network to catalyse the locals' spatial relations, changing the organisation of the space.

In the case of *Ocupar espaços*, the spatialisation of communication and information by means of images and sound enabling the meeting of people that always use the public space in different times, as also the connection of this space with another favela, initiated a discussion on the appropriation of public space leading to a deeper discussion on the excluding social networks that are tacitly installed in those communities and end up as unquestionable structures and fixed organisations. My point is that digital inclusion initiatives should be accompanied by a more careful project beyond literacy: not only computer literacy but also socio-cultural engagement having negotiation in the collective production of public space (physical, digital and hybrid) as the central focus. There is no point in trying to include people in predetermined (and often prejudiced and prescriptive) models. We should rather try and understand popular demands and work towards offering means for people themselves to deal with their demands. Any city model, regardless of its closeness and predetermination, might change its organisation. However, the more consciously open the planning of the city, the more people tend to engage in giving continuity to the production of space changing its organisation.

In the experiment of the TENT the third space that emerged from people interacting with each other and with the images had created a feeling of belonging; there was prana. They used ICT in a way which did not reproduce the current processes of production of space. The example of Ocupar espaços indicates the power of an open design towards the bodily and political engagement of users in shaping their own spaces; that is, in playing not only with the images (changing its structure) but actually interfering with the social relations of production (changing its organisation). It concentrates on process rather than product, use value rather than exchange value, looking at the city as an open interface, not as a resilient system. This means that architects and urban planners might plan against closed planning; that is, it is our job to identify the constellation and its contingency and plan as to enable people to keep on changing the organisation of the city.

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Acknowledgments and credits

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Notes

[1] www.doorsofperception.com

[2] John Thackara,

http://www.doorsofperception.com/mailinglist/archives/2008/07/design_for_resi.php

[3] John Thackara,

http://www.doorsofperception.com/archives/2008/10/its_psychologic.php

[4] John Thackara,

http://www.doorsofperception.com/archives/2008/12/design_opportun.php

[5] According to John Thackara, this new university merges 'the Helsinki School of Economics (Finland's top business school, with 4,000 students); the University of Art and Design (one of Europe's top design and art schools, with 2,000 students); and Helsinki University of Technology (the main technical university, including[6] the country's principal architecture school, with 15,000 students)'.

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[6] John Thackara, http://www.doorsofperception.com/archives/2009/05/post_43.php

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[8] John Thackara,

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[9] http://www.sppsr.ucla.edu/critplan/

[10] http://www.sppsr.ucla.edu/critplan/call.htm

[11] The critique of space as a system is the subject of the next item.

[12] http://www.imdb.com/title/tt0317248/taglines

[13] http://www.mom.arq.ufmg.br

[14]A short video of this event can be seen at http://vimeo.com/4752579