

# OPEN SOURCE ARCHITECTURE

JOHANNESBURG, SOUTH AFRICA

Elina Alatalo 23.9.2009

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Tampere University of Technology  
Instructor: professor Terttu Pakarinen





## ABSTRACT

Open source architecture is an emerging phenomenon, at the moment still looking for its exact definition and practices. In this master's thesis open source refers to the bazaar organization model of innovation and operation, first practiced by software developers as Linus Torvalds.

Open source organization model collects the input of individual agents to emergent behaviour and to collective intelligence. The accumulation of inputs becomes visible in upper organizational levels. Different versions of open source organization model or reactions to it are appearing everywhere in our society. In this context, the notion of architecture does not primarily demonstrate the actualized physic buildings but is seen more as a complex system that puts the stress on the action of production of space. Open source architecture is therefore seen as a culture of architecture that is reacting to the open source organization model. It is becoming visible in new tools, practices, concepts and implementations to our built environment.

This master's thesis is a continuum to a four-week practice-oriented workshop in the townships and slums of Johannesburg, South Africa. The exchange program was organized by Global Studio (GS) in the summer 2007. GS is based on the initiatives of UN Millennium Project. Questions arisen during the workshop and my interest to look into the relation of architecture and development, led this thesis

later on to the themes of open source. Open source architecture could be studied concentrating only on the developed countries but to my concern the notion reaches its full meaning when dealing with global questions.

In the context of development co-operation, open source architecture becomes enchanting, especially, because of its potential as a catalyst for three themes: information, practices and income. To gain development, there is the need for information on the actual reality. This data has to be first collected, processed and then shared. We are also looking for new, more functional and inclusive practices for the production of cities. In addition, we need new models for generating income.

The core idea of open source is in its functionality. The concept is not to be oversimplified by looking too much into its idealistic aspects. Open source can be misinterpreted if we concentrate to examine it only as charity or non-profit work.

The case study of Johannesburg proved the irrelevancy of traditional planning. Firstly, there is not yet reliable information of the situation to base a plan on. The grass-root knowledge and the formal information are controversial. Secondly, no conventional plan would be realisable, as the operators are dispersed and polyphone. The execution possibilities are scattered to small units. This makes big scale investments difficult. Simultaneously, the small-scale actors do not

usually hold resources to put up any projects.

Nothing is more prominent than the knowledge of what yet is not but what could be. The approach of this thesis is based on research of the future. Futurology is a pragmatic science looking for development possibilities characteristic to each era. It emphasizes the visions that are desirable and achievable. This includes the search for and interpretation of weak signals. Open source is one.

Dominant conceptual model of a city guides strongly the work of an architect. New social and physical structures in society lead to reconfigurations in the city concepts. The principles of these new structures and the new organizational capacity are mostly generated by innovations in information and communication technologies. At the moment, we conceptualize city as a complex rhizomic ecosystem driven by individuated urban actors. This is diversifying the profession of architects. We face tasks such as designing evolutionary processes. Open source proposes a model for evolutionary design.

The aim of this theory emphasized thesis is to draft what open source architecture could be about and to stimulate the discussion on the themes around it. This study is to be seen as an opening for further investigation.

## PREFACE

The workshop of Global Studio 2007, held in Johannesburg, South Africa, forms the background of this thesis' case study. Global Studio (GS) is an on-going interdisciplinary teaching and research experiment based on the Millennium Project of the United Nations. It aims to develop concrete action plans to achieve global partnerships that target to reduce extreme poverty. GS assembles together yearly about 70 students, academics and professionals of city building professions from developing and developed countries.

Global Studio of Johannesburg was preceded by workshops in Istanbul, Turkey and Vancouver, Canada. Since 2007 GS has continued the collaboration in Johannesburg. The program is developed mainly by the founding partners, the University of Sydney (Australia), Columbia University (USA), the University of Rome (Italy) and a consortium of other universities. GS provides opportunities to develop professional education and practice. In Johannesburg, GS consisted firstly of a four-day conference at Wits University, continuing as tutored work in small groups. The participants were divided to work on three different townships. Inside these three groups, smaller teams of approximately four people worked on self-generated themes. Work was done in association with the existing community contacts. The focus was on the field studies done in the slums.

After the GS our group of Marshalltown area has kept in contact and has plans on continuing the communication. This group work has been the basis for several more specific and dispersed studies since.

This thesis is done primarily to continue the interaction born during Global Studio.

I would like to say a special thank you to the team of Marshalltown, the local contacts and our mentor professor Rodrigo Tapia from Pontificia Universidad Católica de Chile. I would also like to thank professor Terttu Pakarinen and the colleagues in Tampere University of Technology, Finland, for the support and illuminating discussions. In addition, special regards to media and community artist Mikko Lipiäinen for his guidance to the culture of open source. Thank you also to Päivi Puhtila for her instruction in English language matters.

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## TIIVISTELMÄ

Avoimen koodin arkkitehtuuri on yleistyvää ilmiö, joka tällä hetkellä vielä etsii käytäntöjään ja tarkkaa määritelmäänsä. Tässä diplomityössä avoimella koodilla viitataan basaarin järjestäytymistä noudattavaan innovaatio- ja toimintamalliin, jonka ensimmäisiä käyttäjiä olivat ohjelmistojen kehittäjät kuten Linus Torvalds.

Avoimen koodin järjestäytymismalli kerää yksilöityneiden toimijoiden panoksen emergentiksi käyttäytymiseksi ja kollektiiviseksi älyksi. Panosten kerääntyminen tulee näkyväksi yleisillä järjestäytymisen tasoilla. Avoimen koodin järjestäytymismallin eri versioita ja reaktioita tähän järjestäytymisen tapaan on yhä enemmän havaittavissa yhteiskunnassamme. Avoimen koodin yhteydessä arkkitehtuurin käsite ei ensisijaisesti viittaa toteutuneisiin fyysisiin rakennuksiin vaan nähdään enemmänkin kompleksina systeeminä, mikä painottaa toimintaa ja tilan tuottamista. Avoimen koodi arkkitehtuuri viittaa täten siihen arkkitehtuurin kulttuuriin joka reagoi avoimen koodin järjestäytymismalliin. Tämä on tulossa näkyviin uusina välineinä, käytäntöinä, konsepteina ja toteutuksina rakennetussa ympäristössämme.

Diplomityöni jatkaa kuukauden mittaista käytäntöä painottanutta Etelä-Afrikan Johannesburgin slummeissa toteutettua työpajaa. Vaihto-ohjelman järjesti Global Studio (GS) kesällä 2007. GS perustuu YK:n vuosittain toteutettuihin työpajan aikana esiin nousseet kysymykset sekä kiinnostukseni tutkia arkkitehtuurin suhdet-

ta kehitykseen, johdattivat lopputyöni avoimen koodin teemoihin. Avoimen koodin arkkitehtuuria voisi tutkia keskittymällä kehittyneisiin maihin, mutta mielestäni käsite saavuttaa täyden merkityksensä, kun se on tekemisissä maailmanlaajuisten kysymysten kanssa.

Avoimen koodin arkkitehtuuri sovellettuna kehitysyhteistyöhön tulee kiehtovaksi etenkin, koska se sisältää piileviä mahdollisuuksia kolmessa teemassa: liittyen tietoon, käytäntöihin ja toimeentuloon. Kehitys vaatii tietoa todellisuudesta. Tämä tieto tulee ensin kerätä, käsitellä ja sitten jakaa. Me etsimme uusia toimivampia ja sallivampia käytäntöjä kaupunkiemme rakentamiseen. Lisäksi tarvitsemme uusia tapoja synnyttää elinkeinoja.

Avoimen koodin ajatuksen ydin piilee sen toimivuudessa. Käsitettä ei tulisi yksinkertaistaa keskittymällä liikaa sen idealistisiin näkökulmiin. Avoin koodi saattaa tulla väärin tulkituksi, mikäli tutkimme sitä vain hyväntekeväisyytenä tai yleishyödyllisenä palkattomana työnä.

Johannesburgin esimerkki osoitti, että perinteinen suunnittelu ei ole olennaista sen yhteydessä. Ensinnäkin, toistaiseksi ei ole olemassa luotettavaa tietoa, jolle suunnitelman voisi perustaa. Ruohonjuuritason kokemukset ja virallinen tieto ovat ristiriitaisia. Toiseksi, mitään tavanomaista suunnitelmaa ei voisi toteuttaa, koska toimijat ovat hajaantuneita ja moniäänisiä. Toteutusmahdollisuudet ovat siroteltuina pieniin yksiköihin. Tämä tekee ison mittakaavan panostuksista vaikeita. Samanaikai-

sesti pienen mittakaavan toimijoilla ei yleensä ole voimavaroja projektien aloittamiseen.

Mikään ei ole merkittävämpää, kuin tieto siitä mitä ei vielä ole olemassa, mutta voisi olla. Lopputyöni näkökulma on tulevaisuuden tutkimuksessa. Se on käytännön läheinen tiede, joka etsii jokaiselle aikakaudelle ominaisia mahdollisuuksia kehitykseen. Tulevaisuuden tutkimus painottaa näkymiä, jotka ovat haluttavia ja mahdollisia saavuttaa. Tämä sisältää heikkojen signaalien etsimistä ja tulkitsemista. Avoin koodi on yksi heikko signaali.

Vallitseva käsitelmä kaupungista ohjaa voimakkaasti arkkitehtien työtä. Uusi sosiaalinen ja fyysinen rakenne yhteiskunnassa muokkaa uudelleen näitä tietämme sisäisiä peruskäsitelmiä. Uusien rakenteiden periaatteet ja lisääntyvät järjestäytymisen voimavarat syntyvät etenkin kommunikaatio- ja tietoteknologisten innovaatioiden kautta. Tällä hetkellä käsitämme kaupungin kompleksina rihmastoisena ekosysteeminä, jota yksilöityneet urbaanit toimijat muokkaavat. Tämä monipuolistaa arkkitehtien ammatinkuvaa. Tehtäväkenttäämme tulee kullumaan evolutionaaristen prosessien suunnittelu. Avoin koodi tarjoaa yhden mallin evolutionistiselle suunnittelulle.

Teoriapainotteisen oppinnytetyöni tavoitteena on luonnostella avoimen koodin arkkitehtuurin käsitettä ja herättää keskustelua siihen liittyvistä teemoista. Tämä työ tulee nähdä avauksena myöhemmälle tutkimukselle.



**ALCO**  
PANELBEATERS:  
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# INTRODUCTION

## CASE STUDY

Marshalltown in Johannesburg was not initiated as a case study area, but during the first days of GS its current state as a hidden slum in the core of a megapolis drew our attention. A group of people interested in this controversial situation was improvised. We saw potential in the vacuum just next to skyscrapers. The center of Johannesburg is the bustling driving force of African business. At the moment the city is getting ready for 2010 FIFA World Championship. In Marshalltown, these high-class development pressures collide with hijacked ex-industrial buildings controlled by slumlords. The only pre-existing contacts to the area were through the local office of Motsepe Architect's which had done draft studies and plans on Marshalltown.

Trying to read and understand Marshalltown and contact its actors formed the major part of our work during GS. We managed to make visible some active grass-root communities. We also showcased that the information, on which the city was building its development plans, was dangerously outdated, incomplete or distorted. We demonstrated that the existing plans lead to negative development instead of sustainability in the city scale. The projects supported by the city of Johannesburg were not contributing to the actual challenges. The redevelopment plans including demolition of existing structures and cultures were wiping



out any grass-root progress. By contributing strongly to the development of certain selective areas, the city only amplified the segregation. Driving development mainly through big scale actors left masses of individual resources excluded and unutilised. In addition, pushing the poor to the outskirts of the city left less and less possibilities to attack the poverty itself, as the facilities and jobs remain in the center.

## ARCHITECTURE IN PROCESS

This thesis is originally an architect's reaction to a design task but it is in close connection to other fields. My study started as a traditional planning project and was based on an intensive pragmatic workshop on the field.

However, the focus of the thesis changed as a result of studying further on architecture as a part in the transformation process. It became obvious to me that more relevant than achieving a plan would be to ask the questions of how to design and realize something in the context of development co-operation.

The idea of proposing a plan dissolved as the study showed that such a plan could not be based on reality. The designer does not know the context well enough. This reflects a typical situation in development co-operation. The case study also highlighted how controversial the perceptions on the same situation can be. In addition, it demonstrated the simple lack of information and the impossibility of trying to deepen the understanding of the context for the

time being with the tools available. Furthermore, a normative plan is no longer a functional tool for architects. The implementation possibilities follow different scales and mechanisms of production of space than the plan proposes. The case study illustrated the difficulties of heavy formal actors trying to operate in the informal parallel life-world of the poor.

This thesis approaches architecture as a tool for upgrading slums. The aims of architecture in this upgradal process are more diverse than the physical environment. Besides just being the target of the improvement, architecture can also have the role of a medium or facilitator. The interest is in innovation and therefore in the development of architectural projects as well as in the processes of realization of these projects. The main objective is to introduce alternative models to accomplish and synergize the already existing ones. Another objective is to build on the hidden processes of Marshalltown and to bring closer together actors that are at the moment alienated by scale and customs of operating. Open source innovation and operation models provide an interaction surface that enables the authorities and the poor to work on more productive development projects.

My thesis is outlining the open source phenomenon as large. In my opinion, a method of vast interdisciplinary research is essential in gaining any overall understanding. This study is a result of my personal interest in looking further into what open source architecture could be about. The focus of the thesis is on relations of open source culture and the culture of architecture as well as on the interconnections of the three themes introduced in the next chapter.

◁ *Johannesburg Central Business District (CBD) from the top of Carlton Center, Africa's tallest highrise*

▷ *on the other side, Marshalltown*





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## THE STRUCTURE OF THESIS

When looking into facilitating development, architecture is studied through three themes: the importance of information, practices of production of space and the generation of income. In this study, the alienation of the urban actors and the contradictions in operation models are regarded as the main challenge hindering the positive development. These ambiguities have led to incapacity to act, both on the grass-root as well as on the authoritative level, simultaneously resulting in a weak flow of information. The poverty itself inhibits especially the individual development.

This thesis concentrates on how the case study of Marshalltown generated the three themes mentioned earlier. The relevant theoretical discussions are interpreted through and applied to the case study through the three categories. The image collages do not present accurate plans but visions, demonstrating both the general theme of open source architecture and the possible responses to the situation of Marshalltown in the summer 2007.

I am introducing the emerging digital tools, the web-page links scattered among the text, that facilitate the open source architecture. The tools are open source samples accessible via internet. They are extracts from a vast pool and vary from technical and social tools to instructive or accumulative resources and their combinations. Tools are artefacts with a connection more direct to design action than the resources that lean more towards the social

peering, design thinking and discussion.

In Lead to open source culture, I shortly overview the general features of open source phenomenon visible in our contemporary society.

The first theme, information, opens up the problems of misleading data. I introduce possible methods for collecting and sharing information by new social media applications. In these applications the data is managed by devices from the simplest telephone to location aware personal technology.

The concept of architecture as an evolutionary process forms the basis for the proposal of including the evolutionary open source innovation model in our architectural practice. These new practices in dealing with information lead to data driven process planning.

Under the first theme, I also highlight the connection of open source and city space. The new information technologies and devices facilitate not only, but especially, the open source culture. These same devices enhance the integration of virtual and physical worlds. This merging affects our understanding of city and reforms the spatial concepts such as locality, distance, publicity and privacy. I state that city as an interface for a new locative information society offers novel solutions to rebinding people and their environments.

The second theme studies the open source innovation and operation model as a factor that complements and synergizes with the existing planning and realizing practices.

I present some possible combinations of action models that enable the urban actors of different scales to implement slum upgradal projects. The theme explores also the diversifying roles and formalities of designers.

I introduce the concept of heterotopias, as they are the places in the core of development. My interest is especially in the heterotopias that react to peer-to-peer (P2P) culture. I study the notion of the positive otherness as a mode of operation that generates new patterns of action. In connection to heterotopias and their role in facilitating and monitoring change, I zoom in on the concept of the positive other places.

The contemporary understanding of space is also one of the focuses. Seeing space as defined by its relations is integral to the concept of open source architecture. These relations can be material, immaterial, static or temporal. I stress the subjectivity of space that forms the basis of P2P city. The space is experienced by an interpretation of a person in a specific situation. This situation is constructed by the act of production of space. I further on illustrate the relevance of open source model with the broader view on architecture as a complex cultural system that is integral to human action.

On one hand, the third theme stresses the possible role of architecture in generating income for the poor. On the other hand, the interest lies in the alternative ways of enabling architectural projects that try to meet with some of the basic needs, such as shelter and



alimentation. I introduce the concepts of future leap and inclusive business models as forms of interaction in development co-operation. The theme concentrates on the capacity of open source culture in triggering economic development. In addition, it looks from the point of view of an architect into the questions of income and copyright in connection to open source culture.

Final conclusion includes the critical view points on the phenomenon. Open source as such does not automatically guarantee better building. The adoption of the model to architecture is still an on-going process and it is not proposed as the only or always ultimately best method for positive development. Open source is still a juvenile culture encountering plenty of trials which will eventually refine the concept itself. Nevertheless, it definitely holds potential.

◀ *previous spread: the ex-industrial  
Marshalltown*

## LEAD TO OPEN SOURCE CULTURE

### FREEDOM TO

The concept of human development initiated by United Nations emphasizes the idea of freedom to self-actualization. It concentrates on giving people the opportunity to lead the lives they value. Currently, one in every seven people lives in a slum or refugee camp. By 2030, this number is predicted to be one third of the population. According to estimations, currently half of the population in developing countries is under 25 years old. (Sinclair et al, 2006) The young people are getting frustrated in the slums as their own actions seem to have no effect. These individual resources need to be put to use. Open source organization model provides freedom to individual action.

### FROM CRISIS MANAGEMENT TO TEAMWORK

Traditional development aid means immediate assistance in a crisis. It creates the clear roles of a benefactor and a passive receiver. Nowadays, the tendency in development co-operation is towards finding and supporting the already existing processes of progress. The aim is to help people with a relatively small stimulus to act as the motors of their own development and set off a positive chain of reactions.

Global teamwork is about knowhow transfer and easier access to information. To work directly on the initial circumstances that may

cause a possible crisis is becoming more important. The role of development co-operation is not anymore just about handling the consequences. This means actions such as co-operating in Africa on the questions of mass migration, instead of inhibiting the access of illegal immigrants to Europe. The reasons behind mass migration become therefore more important than concentrating only on the consequences and the problems migration brings. Similarly, open source model proposes a form of collaborative global teamwork. It is able to blur the restricting roles of benefactors and receivers.

### LEAP TO FUTURE - OPEN EXCHANGE

Leap to the future as a concept refers to taking the newest innovation and technology to an environment where it does not exist yet. In this kind of environment, there are no structures of the previous development phases to slow down or block the development. This makes the prototyping process of a new subject faster. On one hand, it brings new capacity, facilities and information to an area where they are highly needed. On the other hand, the idea of open exchange stresses the application of innovations in practice and the importance of feedback from these experiments.

In order to really understand a problem, one has to first implement a solution. This im-

plementation then again proposes new questions. The knowledge gained through these iterations can be brought back to more rigid systems, as from Africa to developed countries.

This possibility for business has become interesting especially now as the western economies are crashing. Moving the prototyping and production to developing countries that show potential for activity is only logic. Open source organization model can be a tool for a leap to the future. It also shares with the concept of leap to future the vision on evolutionary development by cycles of knowledge collection and implementation.

Solving the most critical questions concerning global ecosystem is highly dependant on whether or not the living standards of the developing countries rise in a sustainable way. The developing countries can leap over some of the development phases right to the future. They do not need to repeat the mistakes of the western civilization as the means for avoiding them already exist. In addition to ecological and economical sustainability, this applies to social and cultural heritage as well.

Japan is a good example of a country where modernization has not meant westernization. Developing countries have the possibility of maintaining their cultural features but still gaining human development. This can be obtained, for example, by utilizing open source organiza-

tion model to accumulate and share information which then can be contextually applied.

## INDIVIDUATION FOR THE WHOLE

A new form of organization is resulting from self-actualization and this organization also functions as the basis for open source model. Peer-to-peer is a mode of action recently accelerated by the creative use of new social media through internet. P2P is about individualism that underlines the personal choice to act according to the individual's values. Through these choices, individuals then participate in social activity of a group that shares the same ideas. The different social peers, in which each person belongs to, might form an unexpected or contradictory collage that does not necessarily overlap. A contemporary priest can be a part-time butcher who enjoys parkour as a pastime. Our culture is becoming the one of high specialities.

Large-scale actors are changing their operation models towards enabling these self-organizing microcultures to gain ground. P2P communities support plurality and personal adaptation. Their dynamics are needed as alternatives to rigid, slow and generalizing large-scale structures, such as the state and big non-governmental organizations. Nevertheless, these mass operations and microactions can be built to support each other, especially with the help of new information technologies. Some static base structures are needed to build on but scattered small-scale actions are the buffers and the quick launchers in the turns of the development. For

example, a city that has a flexible traffic system of several forms of transport will not be paralyzed when one metro line breaks down.

## HACKER'S WORK ETHICS

The modernist code for work and the division of work and leisure to separate concepts is challenged by the notion of hacker's ethics. This attitude originates from the network society and draws on the idea that activity should be motivated primarily by the desire of self-actualization, not by money. This activity aims to create something that the individuals themselves and their peer community find valuable. Hacker in this context is a positive term and refers to top experts who are truly interested in developing their field further.

When talking about information technologies, hackers have been the ones transforming the original internet. At the beginning it was used mainly as a technical tool to share the counting capacity of computers but nowadays it has transformed into social media. The freedom of speech and the issues of privacy in internet are mostly being developed and facilitated by hackers. They have come up with anonymous servers through which, for example, emails can be sent to news agencies without being traced. The real-time conversation platforms, IRC's, as well as the freely available Linux operating system are all results of the work of the hackers.

The effects of this organization model have been powerful and revolutionary already even though it has been just a marginal movement.

The most interesting aspect concerning hackers is the innovation model they practice which is open source.

## SOCIAL MEDIA

Social media is a process in which individuals and groups build up common meanings, content and new communities assisted by highly accessible and networked digital tools. At its most basic sense, social media provides new means for people to discover, create and share information. It is transforming monologues into discussions and people from readers to content producers.

While social media consist of relatively inexpensive and accessible tools that enable anyone to publish or access information, traditional media as newspapers and television generally require significant resources. Production of industrial media is typically owned privately or by the state and though controlled and censored by a privileged minority.

Social media, on the contrary, is refined in cycles of individuated users. Through social media anyone has a change of reaching a global audience. Mostly the tools do not require any specific skills. It complements traditional media enabling virtually instant reactions. Its lifespan is evolutionary and accumulative, altered and adopted by collective editing. Social media adds a new layer on human interaction methods and reinvents our organizational capacities. (see Erkkola, 2009) Open source belongs to a pool of social media, though social media itself is not necessarily open source.

## BAZAAR MODEL FOR WORLD WIDE THINK THANK

<http://wordpress.org>

(report)

*Wordpress is an open source publishing platform. It is the largest self-hosted blogging tool in the world and has significantly contributed to the emergence of social media. It is used on hundreds of thousands of sites and seen by tens of millions of people every day. Blog is a diary-kind chronological website usually maintained by an individual with regular entries of commentary, descriptions of events, or other material such as graphics or video.*

<http://www.archdaily.com/>

(report & share)

*Archdaily is one of the most featured online sources of continuous information for architects. It broadcasts the latest architectural news worldwide, such as the most interesting projects, events, interviews and competitions. The blog is maintained by editorial staff but based on feed-in from users.*

<http://www.youtube.com>

(broadcast)

*YouTube is a free online video streaming service that allows anyone to view and share uploaded video clips. The content varies from first-hand accounts of current events to entertainment. Most popular clips can have more than a million views. In a day about 200 000 videos are uploaded having been in total 78.3 million pieces in March 2008. It demonstrates the possible scales of social media.*

<http://www.facebook.com>

(connect)

*Facebook is a free-access social networking website whose users can connect and interact with each other in the networks they form themselves. You can add friends to your networks, follow their activities, send them messages, update your personal profile and share information on your interests. Facebook has more than 200 million active users, half of which log on at least once a day.*

As stated before, open source organization model harnesses the input of individual agents to emergent behavior and to collective intelligence. Emergence is a way in which complex systems and patterns arise out of a multiplicity of relatively simple interactions. These simple interactions happen at a lower organizational level than where the patterns arise become visible. Emergence describes the birth of new properties of systems that are not directly traceable to the system's components but rather traceable to how those components interact. The whole system is seen greater than the sum of its parts.

Emergent behavior appears when a number of simple entities operate in an environment forming more complex behavior together, as a shoal of fishes or an ant colony. This is one of the basic characters of self-organizing systems. The problem solving of an ant colony when encountering a barrier is based on collective intelligence. To enhance the possibilities for collective intelligence to flourish, the pool of existing knowledge needs to be easily available, that is to say open to everyone. In addition, we need plenty of interaction and the amount of individual agents shuffling through all the possible solutions needs to be maximized.

Originally, open source in the context of software development means that the source code of a software program is available to everyone. This has far-reaching consequences. As the

source code is public knowledge, in theory anyone can change or develop the program. The program is passed on usually via internet to the public who often start to improve the functionality of the program on their own. The model conforms to the network logic of an efficient distribution of ideas. As a result, these ideas can be tested in different situations and therefore improved. The model makes good use of the swarm intelligence of a large group of users and developers. The innovation task is dispersed but yet connected. In an ideal situation, this leads to a large community spurting the project at fast pace.

In the open source culture the interest is especially in the bazaar development model introduced by Linus Torvalds. Bazaar style trusts in the idea that once the group of co-developers is large enough, almost every problem is discovered quickly and the solution is always obvious to someone inside the group. In the traditional cathedral-builder view of development, problems are deeply complicated phenomena, demanding plenty of effort. They are tackled only by the few top specialists. This kind of a model creates long prototyping phases, and leads to an inevitable disappointment when the outcome is still not perfect.

▷ *Individuation for the whole. Individuated public transport, meaning single common vehicles used to attain personal targets, can be built to gradually complement existing traffic systems and to include also basic vehicles. Assisted by automated traffic system that allows for example computer-guided platooning in traffic veins, also this kind of splintered public transport is able to move the masses.*





However, in the bazaar model challenges are considered generally shallow phenomena. At least they turn shallow quickly when exposed to a thousand co-developers, each one approaching the task from a slightly different angle. We become eager to release often in order to get more corrections. In this model various corrections prevent the emergence of deep problems during the development chain. As a beneficial side effect of the frequent releases we have less to lose if an occasional generation is not perfect. (see Raymond, 2002)

The complexity of spatial design demands for an interdisciplinary approach. Only through such approach can we glue together diverse view points and achieve innovations no designer alone can accomplish. Open attitude and new tools of information technology will make it easier for contributors with shared interest to participate. New interaction brings new solutions. Shared interest leads to knowledge being shared, not only between different disciplines but also in between professionals, hobbyists and the different scales of action and information.

◁ *Individuated public transport for reaching a personal target. This type of transport is able to meet the altering and individual needs of P2P citizens by functioning actionally close to the principles of already existing informal traffic. It enables a city of less vehicles, a city that needs less parking space and less street space. With a leap to future strategy the traffic system gains the newest technology.*

## **GAINED CONTEXTUALITY BY SPECIFIC APPLICATIONS**

Open source operation model does not deny the existence of an individual or a case-specific solution. On the contrary, the model facilitates unicity. Firstly, it aims to create a factory that is able to produce specific solutions. Software for text editing is an example of a similar type of factory. Secondly, this factory should hold characters that can be personalized to fit the way best suitable for each user. In software we can customize our interfaces. In addition, as the structure of this factory would be transparent and open to modifications, it would become easily adaptable and could be used as a basis for new and more specific factories. For instance, specialists might code to the software a function they found missing to enhance the capacity of the factory for their particular needs. Even more possibilities for specialization are created when this factory is combined to the growing computational capacity that is able to manage heaps of individuated data used as sources for the production of a specific solution.

Therefore open source organization model provides contextuality in two ways: Firstly, by offering a mechanism that enables personalization and production of specific outcomes for specific situations and secondly, by enabling the development of this mechanism itself.





**THEME 1**  
**INFORMATION REVOLUTION SPEEDING UP**

## ACCUMULATE & SHARE

### INSUFFICIENT OR MISSEADING INFORMATION

Information on the context is crucial in development co-operation. Lack of information creates the greatest obstacles. Wrong choices and mistakes are either waste of resources leading to nothing or they promote negative development.

In Mali, donors once put up a fish farm in canals that, had they asked the locals, were dry for half of the year. (Guest, 2005) As another example, the misinformation on AIDS disseminated by South African leaders has been disastrous on the country. It increased the amount of infected people in 15 years from almost none to reaching 5.4 million in 2006 of the total population of 49 million. It is predicted that the number will exceed six million by 2015, by which around 5.4 million South Africans will have died of AIDS. (The South African Department of Health, 2008)

The case study of Johannesburg brought to light how misleading our ideas on modern African megacities might be. These cities are melting pots of different cultures of which we westerns know very little about and which often are not familiar to each other either. Illiteracy and lack of electricity coexist with avant-garde rap lyrics and high-tech gene manipulation.

### PARALLEL REALITIES

The case study represented the lack of communication and interaction that prohibits the access to information. After the workshop,

I spent six months trying to get more information that I could rely on or any data that would be of any use from several different sources. I encountered general slowness and disinterest in dealing with my enquiries. There was bureaucracy and contradictory results. This applied to everything from the simplest street maps to development plans. I was unable to obtain the most basic information, such as names of building owners or what the buildings are used for. Even the location of the public railway tracks was not obtainable information.

The planning culture with its hierarchies is unfamiliar to us and to an outsider it is difficult to create or sustain contacts. The same gaps exist inside the African culture itself. Plans contradict each other and the information is not compounding. It seems as there is no one who would have an overall picture of the actual situation. The focus is far from the non-places and non-people which nevertheless form a massive part of the reality. It is difficult to access information. The top does not know what happens at the grass-root level. The poor are not able to or are afraid of passing their information to the city authorities.

When in Marshalltown, getting into contact with the people living, working or passing by was difficult. They were afraid of us being sent to spy on or evict them. All this because most of their activities are informal or considered

illegal by the authorities. We were also afraid of the people of Marshalltown because of our prejudice. According to the legal sources buildings were empty but on site one could see that they were squatted to their limits.

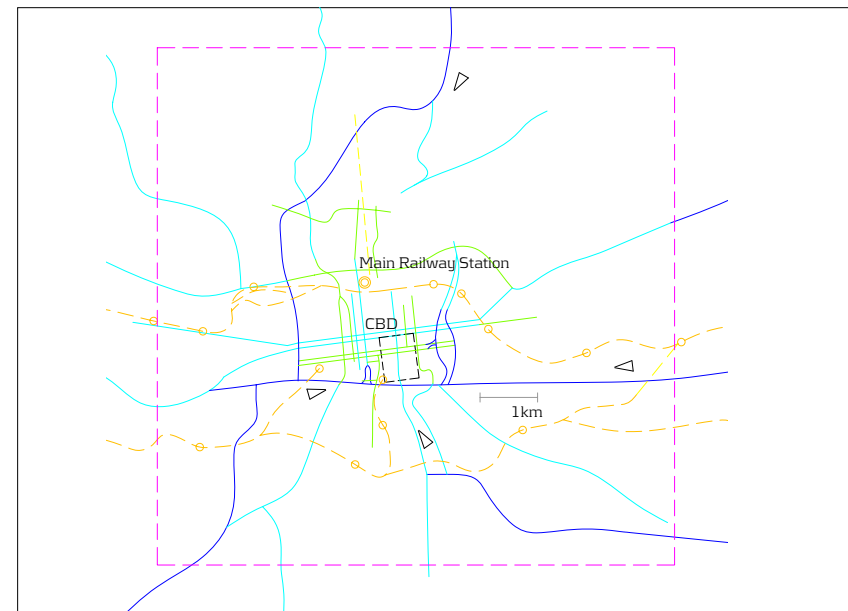
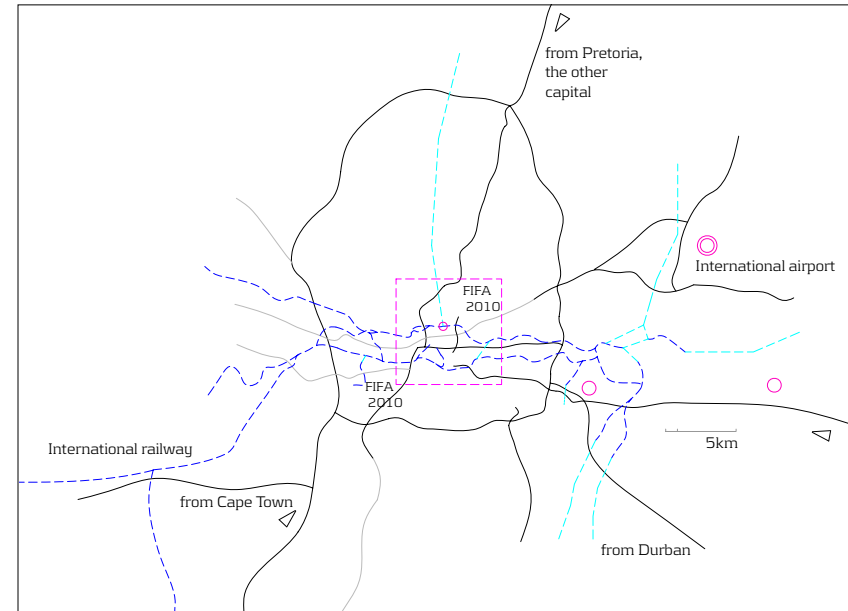
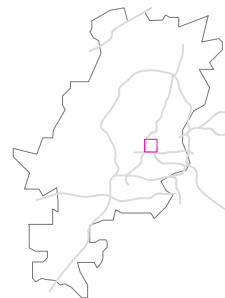
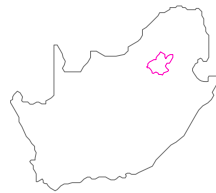
### TYPES AND SCALES OF INFORMATION

Who possesses the information? There are at least two different types of information: the accumulated, global-scale information of sciences and the quiet, local-scale information of a specific context. Actors from global networks or authorities of the state can not use the information they possess since they are not familiar with the context in which it should be applied. They have also resources but the structures of how to target the resources are not familiar to them.

Local principles and practices are essential in getting hold of the hidden existing processes which then can be used as a basis to build on. Local actors do have the information necessary for application but they are not aware of the global-scale information of sciences and do not have the resources to activate anything. The situation is close to a standstill. A new interaction surface and a fuller picture of the situation are desperately needed. Open source is efficient in dealing with information collages, promoting simultaneously new interaction.

zooming in on the core of the core ▷

Maps in this thesis have been compounded according to several, sometimes controversial sources. Interestingly, the most useful sources were the open source facilities. This illustrates the parallel realities, as some information in formal sources has intentionally been left out, such as parts of the street network in the core of the megapolis or an entire public railway network. That information has not been considered important to formal citizen, nor belonging to the normative concept of the city of Johannesburg, meanwhile other information, such as motorways or bank headquarters, has been highlighted. (see *Global Studio*, work of the group Marshalltown, 2007)





university campus

continent scale

civic service

Constitutional Hill

health care

main railway station  
international/local

continent scale

FIFA 2010

big investments

from the biggest international airport

from Pretoria  
the other capital

CBD

business of the continent

Commissioner street

primary active streets

Africa's biggest highrises

banks

secondary active streets

banks

A VACUUM???

motorway

Marshalltown

the feed in motorway from the ringroad

railways

new station

1km

tourists

from Durban

## HOW COME A VACUUM?

One of the most modern city centers in Africa hides a slum in its Central Business District (CBD). In the eyes of the authorities, the site of Marshalltown is more or less perceived as devoid of activity that comprises of mostly vacant buildings (80%), the majority of which are former warehouses. Nevertheless, Marshalltown houses marginalized communities, crime and spatial decay. Yet, people in next block are shopping luxury items in the Africa's tallest high rise.

Johannesburg was established following the discovery of gold and grew by mining to become the major center of economic activity in South Africa. Era of apartheid, having ended only in 1994, together with the modernistic planning method of zoning has formed a highly contrasted city structure of isolated islands. The segregative arrangements during apartheid relocated, for example, the Black African population and Indians to live in townships on the outskirts of the city. They could be seen in the CBD only during working hours. The site of Marshalltown was intended a manufacturing and warehousing annex to Johannesburg.

As apartheid ended, the economic elite fled in the fear of a civil war either to the edges of the city or abroad. The abandoned center prompted massive invasion by people hoping to find low-cost housing or working possibilities. The socio-spatial structure of the core of the city in relation to outskirts turned upside down. It accelerated the emergence of inwards-turning nucleus compounding the city itself. In the center, the facilities and infrastructure left behind have rotten. In addition, they were not initially meant for sustaining the population they are used by at the moment. Marshalltown as a gateway to the CBD has continued as a reception area of the migrants and immigrants of the city. It is a vacuum, attracting energy but for the time being still sealing it out. (see Global Studio, 2007)

## SUPPORTING THE CENTER ITSELF

At the moment, the city center is not housing as many people as it could, the demand still being high. Immigrants tend to move on to the slums of the townships on the outskirts, like to Diepsloot or Orange Farm. Accessibility to the center remains nevertheless important. Most of the work opportunities and other facilities stay in the center but the connections are poor. The distances of 25-60 km from townships equal one to two hours of travelling by mini-bus-taxis and ask for relatively insupportable prices compared to daily incomes.

Diversifying the possibilities in the townships is one tool to tackle the poverty. Nevertheless, developing the center itself would already reduce the pressure on the townships and bring the focus of activity back there where it has plenty to synergize with.

◁ where parallel realities co-exist, holding potential for synergy



▷ Marshalltown study area as well as the blocks that are concentrated on

◁ In formal sources of information the scale and methods of moving emphasize a private car, representing only one layer of the situation...

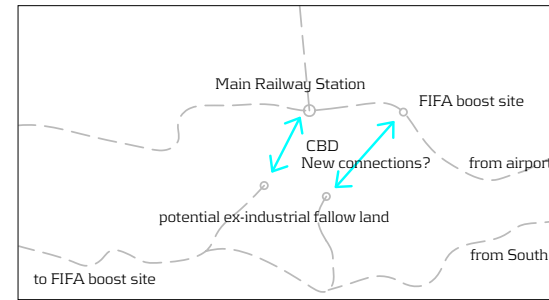
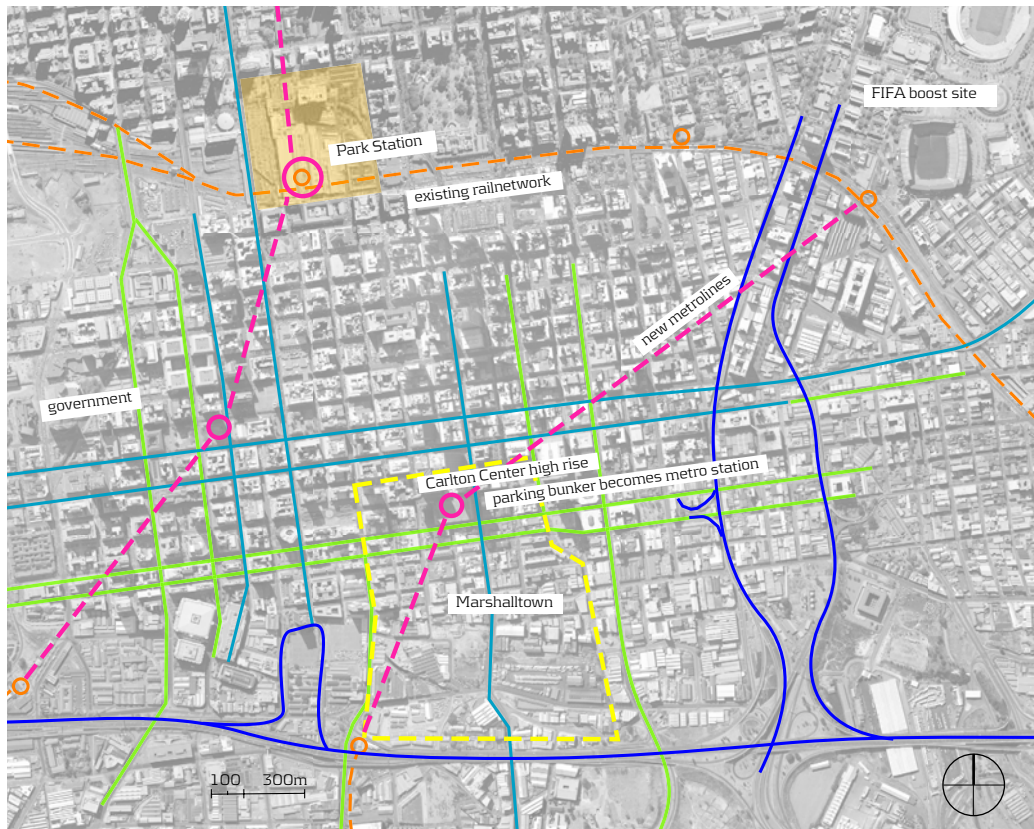


◁ ...as actually for the majority of the people the functioning and accessible methods and scales of transportation are very different, mostly consisting of the informal minibuses that change the locations of ranks, routes and timetables according to demand. The map points out the situation in Marshalltown, in July 2007. Similar small-scale tissue of informal traffic facilities most probably exist everywhere in the city of Johannesburg.



## CONNECTING TO ACTIVATE

The Central Business District itself lacks efficient public transport. The need to move around during FIFA 2010, the Football World Cup, asks for connections that are missing also from the daily lives of the inhabitants. To FIFA there is an expectation of 10 million visitors in a month. The activity of massive improvements at the FIFA-sites could be used as a catalyst to development of the fallow lands of the ex-industrial areas that are located between those sites. (see Johannesburg, 2008)



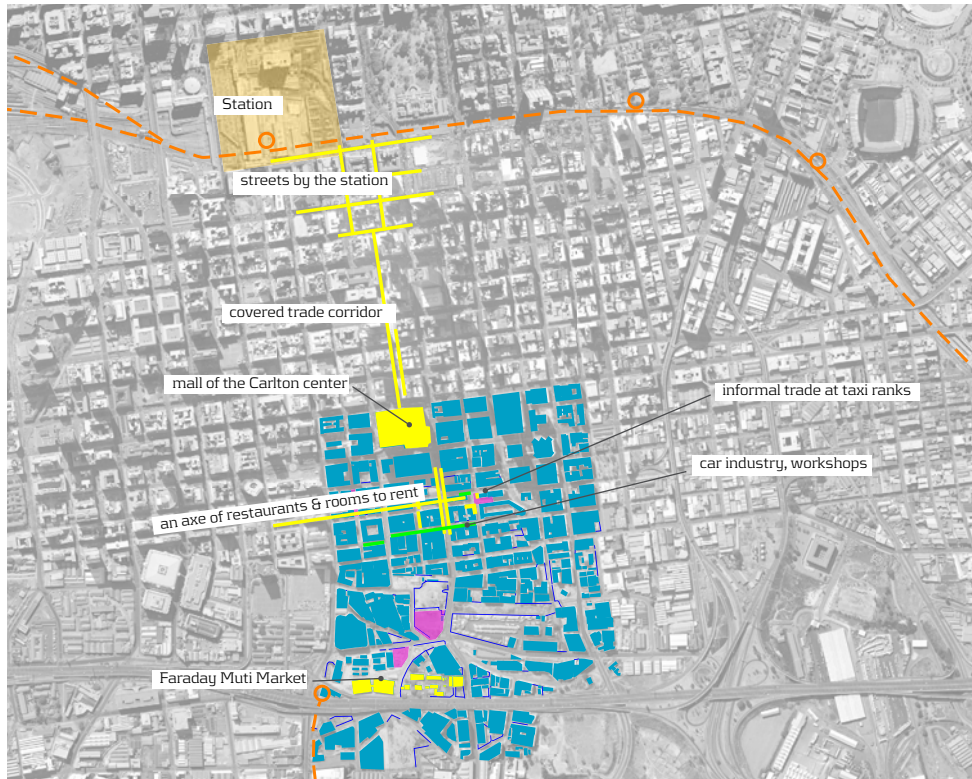
△ re-concepting the rail network

◁ The parking bunker of the Carlton Center high rise, is one of the biggest physical obstacles dividing Marshalltown from the center and inhibiting the use of the most potential activity vein to connect CBD to the southern city entrance. A bunker transformed into a metro station would turn the situation upside down.

Most probably I do lack of some information on why these south-north connections have not been activated before. However, even if they would for some reason be impossible to implement as such, I want to underline the need and possibilities for a fast connection able to transport masses.







▽ knitting some of the different activity nodes together

△ existing vivid business activity



**EXAMPLES ON DIVERSE HOUSING SITUATIONS  
IN THE ASSUMED DESOLATION, SUMMER 2007**

**1 Urban shack settlement**

former gold mine entry  
some food production, cultivations  
approximately 250 residents  
an ex-rural community with rural customs  
1 toilet

**2 Hijacked building**

approximately 50 rooms  
rent R350-400 (30-35 euros) to a hijacker  
unstable situation between the hijacker and the landlord  
residents trying to deal directly with the actual landlord  
many of them work in CBD  
single men  
electricity cut, no sewage or water

**3 Church**

approximately 1000 homeless sleeping nightly  
(community effort)

**4 "Dark Place"**

squatted, no electricity, sewage or water  
no daylight  
heated up with several bonfires

**5 Johannesburg Housing Company**

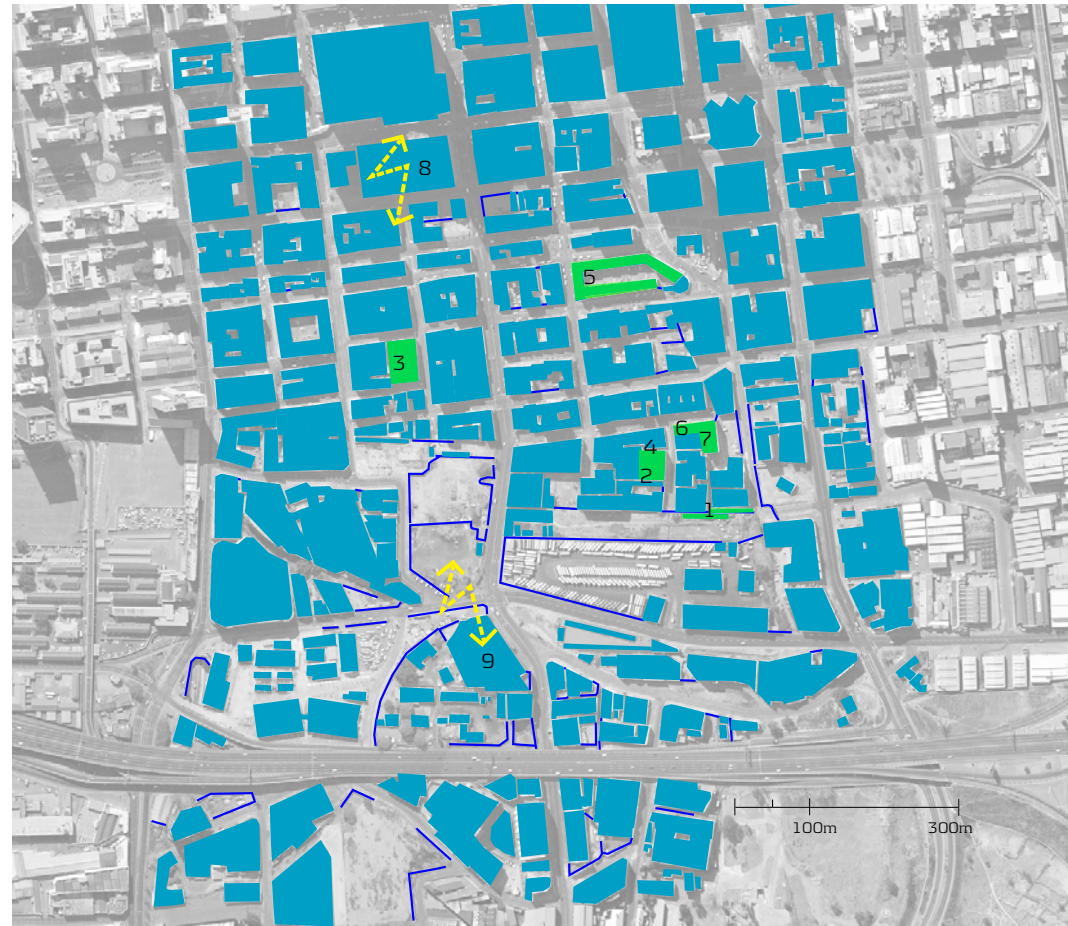
New development  
relatively expensive rents, nearing R1000 (88 euros)

**6 Formalizing**

60 rooms for R380-1100 month (33-96 euros)  
difficulties in re-labeling the building as residential  
no showers, discontinuous electricity  
tuck shop, handicraft, small children

**7 Formal**

98 rooms for R440-630 month (38-55 euros)  
bathing and cooking facilities in each room  
landlord lives in Hong-Kong  
shares the responsibilities with the active resident's  
association



**SOME OBSTACLES AND CHALLENGES**

Wild car traffic culture

**8.** Carlton Center parking block

**9.** Taxi war: Informal taxi versus formal facilities

Parking on the sides of the street

High concrete walls cutting off open spaces

Dead end streets and barricaded blocks

▷ minibus at rest in one of the dead ends

▷ next spread: mining out the hidden local processes and breeding them with global weak signals. First map present examples on the grass-root activities that our group managed to track during GS. That information is not familiar to formal sources. One can only imagine how much hidden local information there actually exists.



ANC  
MOTOR REPAIRS  
REPAIRS

PANEL & PAINT  
BEATERS

STOP  
CTS BRAKE PADS  
CTS BRAKE PADS

BOYNE'S GARAGE  
REPAIRS & MAINTENANCE  
MOTOR REPAIRS

REPAIRS & MAINTENANCE

car industry/repair

car industry/repair

car industry/repair

grocery store

car industry/repair

shops

meals/rest.

car industry/repair

shops

shops

"landlord" committee

homeless in the streets

shops

informal shops

car industry/repair

recycling

communities succeeding in legalizing their housing

manufacturing

unorganized dump

handicraft

hijacked building

manufacturing

manufacturing

community wash

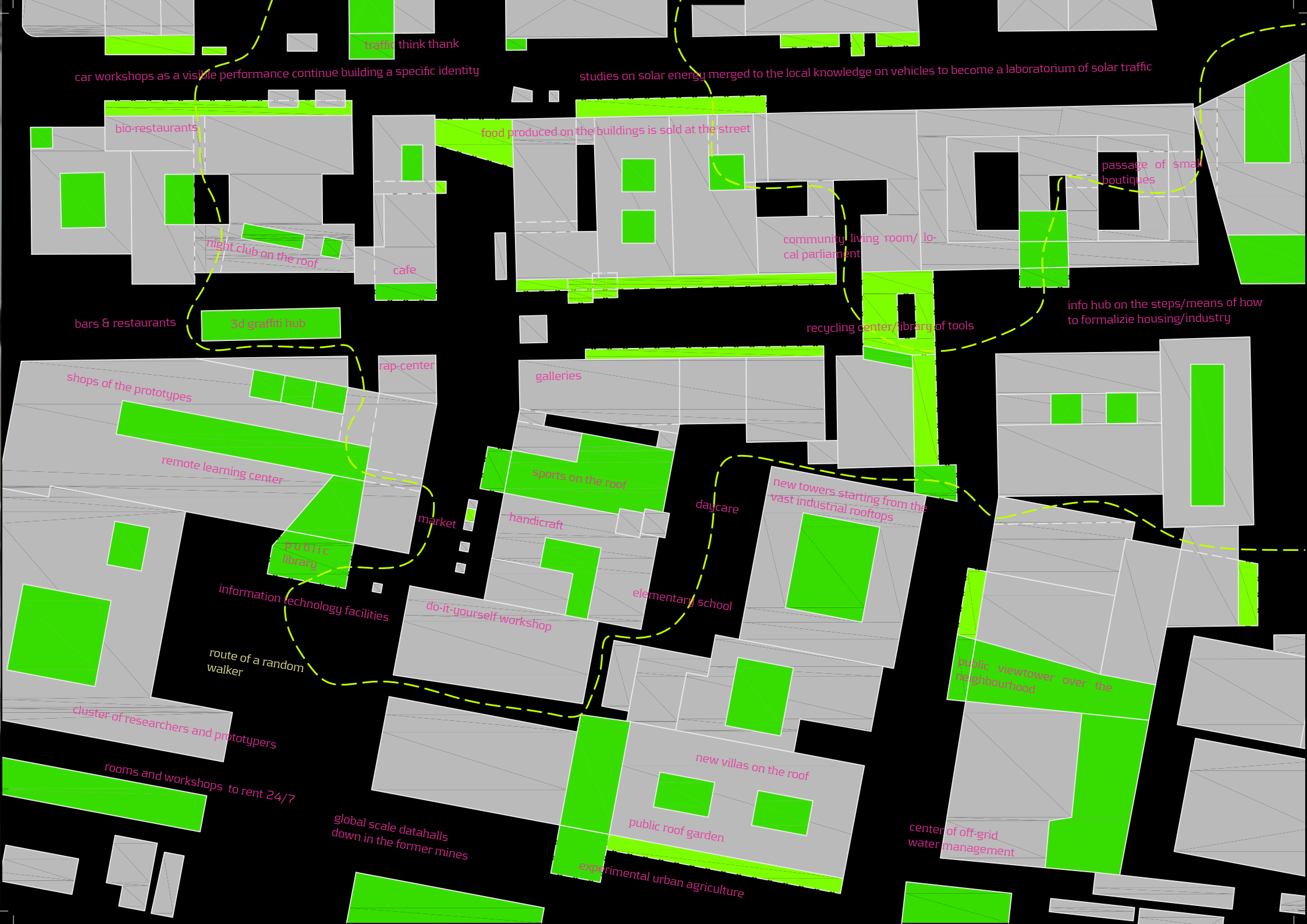


1:1000

36

shack settlement

connection to the mines underground  
some urban agriculture



traffic think tank

car workshops as a visible performance continue building a specific identity

studies on solar energy merged to the local knowledge on vehicles to become a laboratory of solar traffic

bio-restaurants

night club on the roof

cafe

food produced on the buildings is sold at the street

community living room/ local parliament

passage of small boutiques

bars & restaurants

3d graffiti hub

recycling center library of tools

info hub on the steps/means of how to formalize housing/industry

shops of the prototypes

remote learning center

public library

information technology facilities

route of a random walker

cluster of researchers and prototypers

rooms and workshops to rent 24/7

global scale datahalls down in the former mines

market

rap-center

galleries

sports on the roof

handicraft

do-it-yourself workshop

elementary school

daycare

new towers starting from the vast industrial rooftops

public viewtower over the neighbourhood

center of off-grid water management

new villas on the roof

public roof garden

experimental urban agriculture

<http://ocw.mit.edu>

(share)

MIT OpenCourseWare (OCW) is a web-based publication of virtually all MIT course content. OCW is continuously open, available and updated. It includes free lecture notes, exams and videos from MIT and asks for no registration. OCW does not offer degree courses but you can find approximately 1800 up-to-date courses on all the subjects studied in MIT.

<http://www.wikipedia.com>

(accumulate, share)

Wikipedia is an open encyclopedia published in internet. It is based on collaborative accumulative production and share of knowledge. Anyone is welcome to add information as long as it is done within Wikipedia's editing policies. In the ideal situation, as the the amount of expert knowledge accumulates, the liability of the information Wikipedia produces increases. It differs from a paper-based reference source. Older articles tend to be more comprehensive and balanced, while newer articles more frequently contain significant misinformation. However, Wikipedia is continually updated. Most importantly, the production of information in Wikipedia is transparent and documented.

<http://fle3.uiah.fi>

(learn)

Fle3 is a web based open source learning environment. It is designed to support learner and group centered work that concentrates on creating and developing expressions of knowledge and design. Fle3 contains three learning tools and several administration and management tools. For collaborative learning, Fle3 offers shared course folders, platform for a wiki-kind knowledge building system and collaborative sketching tools for digital artifacts with retraceable versioning.

<http://www.openstreetmap.org>

(create, share)

OpenStreetMap is a free editable wiki-map of the whole world. OpenStreetMap allows you to view, edit by creating an editor account and use geographical data in a collaborative way. It includes the basic facilities of searching a place or route. Interestingly, it is often more up-to-date than formal map sources.

<http://www.openlayers.org>

(build on)

OpenLayers is a dynamic open source map viewing library, an empty platform similar to Google Maps. It is easy to incorporate maps with locative information from various sources into the platform and you can include the platform in your webpage or application. OpenLayers currently has features such as layers, navigation, icons, markers, and layer selection.

<http://www.maptube.org>

(create, share, collate)

MapTube is a free open source resource for viewing, sharing and mixing maps online. The main principle of MapTube is that shared maps can be over layered to compare data visually by adjusting the transparencies of the layers. Maps can be viewed by everybody without logging in, but to create a map requires an account and a username. The maps visualizing any data the map creator finds interesting, heaped by users to combinations according to their instincts, generate unpredictable collisions of information. MapTube is built on OpenLayers.

<http://www.londonprofiler.org>

(collate, view)

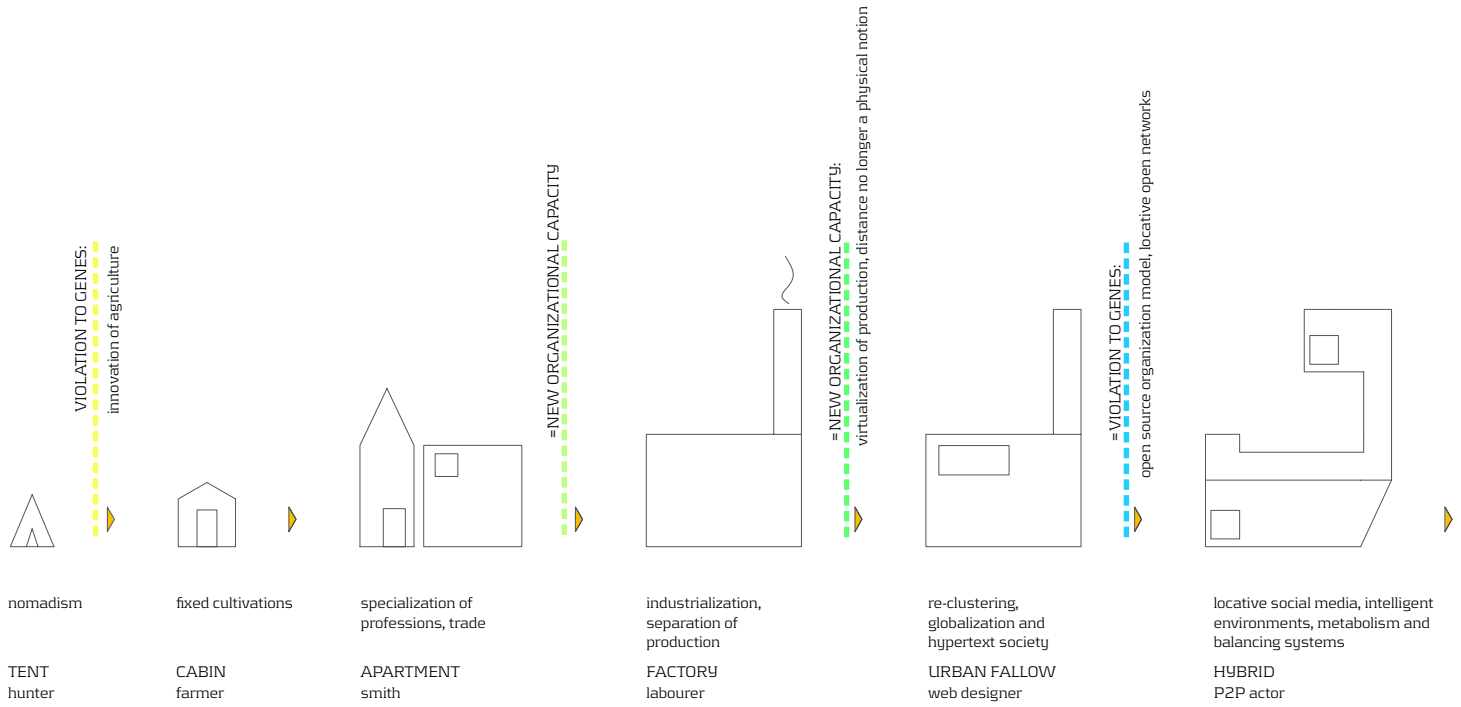
Londonprofiler is a specialization of MapTube to share information on aspects chosen by the map creator. Here you can visualize a neighborhood's profile using different area classifications. The platform highlights the individual discoveries and experiences of viewers, probably raising more questions than providing answers. Themes include access to internet, education level, multiculturality, health, crime, land price and other.

[www.mimoo.eu/](http://www.mimoo.eu/)

(find)

Mimoo is a free online architecture guide. It shows Modern Architecture on a map with the address and all additional information you need to for visiting these places of interest. It is open for everyone to contribute: publish your projects, posts comments and ratings, define your personal favorites and keep track of the projects you have visited. It also works together with, for example, the navigator of your vehicle. All this personal information, reviews and opinions, defines the current architectural trends but also helps to locate the pearls that are usually ignored by the mainstream.





*location aware social media=new organizational capacity & principle=violation to genes of city system=turn in development*



# DESIGN ON ACCUMULATION

◁ *abstraction of evolution of building (both as a verb and a noun)*

## EVOLUTION OF BUILDING

Applying open source organization model to architecture is based on perceiving also architecture as an evolutionary process. The relationship between people and building, the latter both as a verb and a noun, is much deeper than hypothesized. In architect Caniggia's conceptions of our images of a city and of our behavior in cities, he suggests that building, again in both of its meanings, is an evolutionary or even a biological part of a human being. The concept of building lives in us, partly unconsciously, conditioned by the cultural background, previous common experience and accumulated cognitions. We share a certain understanding on building that derives from the historical, social and local context. (see Caniggia, 2001)

The existence of a certain building depends on a past sequence of other buildings. This can be called the phenomenon of derivation or iteration. Without the previous buildings and the succession of the concept of a house, the building would not have its formative characteristics and a certain behavioral pattern. This demonstrates that the building has inherited also the reasons why previous buildings were made as such.

Building is therefore a type of a cause-effect relationship. The cause is not a sudden need to have a certain building, yet that can be its remote origin. The cause is more about the culture of previous buildings.

When we examine the typological processes, we note that the manmade structures tend to become more complex in the course of time. Studying the human culture, we also notice that the specialized building can be regarded as a phenomenon similar to development of the division of work.

The characteristics we consider necessary for a modern house and lifestyle will only multiply and diverse. Cities evolve the same way. There is no way back to simpler interrelations of the past without a total collapse of our civilization. In sustainable building, this means that it is unrealistic to hope that the issues of sustainability could be tackled by somehow going back to the previous organizational models of society. Our image of life in the contemporary countryside, for example, might be totally misleading. It is glorified and mystified to match only the memory of that culture. The systems that promoted the memory have already changed and the lifestyles of the people dispersed.

When we look at building as an evolutionary development that has been accumulating information since the early days of our culture, open source can be seen as a modern appendix tool enabling the acceleration of the iteration cycles. For open source to be efficient, the structures need to be inherited simultaneously as created, thus shared openly. As stated be-

fore, facing a complex crisis such as slums in megacities, faster and more productive innovation and operation tools are welcome.

## INHERITED STRUCTURES

Each phase of evolution of the environment leaves legacies to the structures to follow. The concept of environment encompasses the natural structures of topography, climate and vegetation together with the human structures, both depending on one another.

According to Caniggia, the adaptations of forms existing during one period are the basis of new forms created in the following period. Each successive phase reuses the structures of the previous phases. The typifying and carrying structures of the previous phase are used in the subsequent phase as secondary structures. They will no longer be carrying but marginal, remaining at the level of specialized structures. These processes create cycles of development.

We have a phase sequence of booms and slumps, nevertheless every phase is different because it has to take into account the inherited structures. (Caniggia, 2001) Consequently, the modern working conditions of an architect are also getting even more complicated. The data driven planning can offer new tools in this situation.



## DATA DRIVEN PLANNING

Information can be used for complementing our design methods. Building as culture is similar to language. It is based on the development of a certain locational and historical context but in order to remain vivid it adopts new uses, new words and new concepts. It is difficult to talk about the contemporary P2P internet-mediated culture with the vocabulary dating back fifty years.

Consequently, in the context of contemporary mechanisms of production of space, a way of enabling us architects to use our traditional professional skills such as intuition, sense of three-dimensional space and visual creativity, is to base the use on the newest tools of information. The validity of information at hand is, however, to be questioned. Its importance has to be seen as relational, again as a tool, not as the dominant feature of the building act itself. New tools have the potential of enriching the architectural practice but this depends on how they are used. The data can be used in a design process with the same fearless creativity as any other ingredient.

Human development and human design are also about acknowledging the lifestyle of modern people. If sustainability is dependent on our abilities of refusals, of leading a

◁ *Participating in global metabolism. The accelerating information society needs increasing computational power; one source of it being the huge assembled data halls. Servers ask for excessive cooling and large space which has resulted in locating the halls to nordic countries, for example. The empty mines beneath Johannesburg provide similar low-temperature facilities.*

life somehow less, it will never happen. My life is based on travelling in between cities. I aim to use public traffic and minimize the unnecessary travels. Nevertheless, travelling is a part of my job, and I enjoy it, so I could not just stand still. Fortunately, even extravagant lifestyles can be sustainable if the system is planned well enough. In my case, we would need, for example, common vehicles that run on electricity that they produce themselves.

Sustainability is about design becoming data driven planning of a city metabolism that takes into account the flows of resources, existing processes, facilities to be reused and leftovers to be matched with the needs. The complexity of the city's various autonomous systems, each with their own logic, means that no one is able coordinate everything. The chaotic situation has a logic of its own produced by actors with different motives. There is no longer room for a master plan or master planner.

As multifunctional nodes and hybrids have become the norm, this causes problems for planners accustomed to design strategies that are based on segregated functions. Here data driven process planning becomes a necessity. According to architect Shane, the key to restructuring this multi-centered, multi-vocal and multi-modal city is in self-organization and inventive feedback systems. Open source is a data driven process that functions through self-organized P2P-hackers and is based on accumulative feedback.

We have a say even in front of a chaotic city development. Growth and shrinkage of cities is studied and tested by simulations based

on the same mechanisms, high computational power and complex software as weather forecasting. However, they get it wrong once in a while. What these simulations cannot take into account, is the development driven by human decisions. This illustrates that we have the possibility to contribute.

## PLANNING WITH PROCESS IN MIND

Process planning refers to planning with an understanding of the city as an ongoing transformation process, where the recognition of local characters and the act to enrich them is essential. Analyzing, planning and realizing projects happen in simultaneous overlapping interaction. This is a search for the acupuncture points of the city which then will be stimulated. The aim is to guide the processes instead of governing separated redevelopment projects.

The system's reactions to interventions are studied and the plans modified immediately according to the responses. Plans react also to altering needs of the urban actors. The awareness of the large-scale and long-term aims has more the role of a strategy, than something concrete. Carefully detailed planning is considered to restrict the swift adaptations with its specificity. Concurrent different scales are inseparable. The architecture of buildings is the tool for realizing large-scale visions and vice versa. The city scale understanding is necessary to the architecture. As a working method, it means that an idea goes through the impact of different scales, people and points of view and therefore the idea is refined in the process.

## DATASCAPE

Datascape is a collection of information, a database on a city as a whole, for example. In addition to legal plans and legislative rules, it also holds information on a variety of features that affect or guide the building. Datascape can be seen as real time realm, containing different levels of formality and scale. Datascape creates the connection to local bottom-up knowledge making the interaction of informal data, official plans and formal information comparable and accessible to each other.

Planning with the process in mind requires data driven planning with up-to-date information. The reactions must be instant before the circumstances have already changed and the action planned becomes useless or negative. When an urban actor comes up with specific needs, the datascape can be consulted on what location would best meet those demands. The requirements of the other actors are also taken into account. Datascape could even propose a synergetic co-operator.

At the moment, formal city planning has ended up becoming mostly a tool for recording and legalizing the actions and decisions made already somewhere else. With the help of datascape, the city authorities could offer a facility that would tempt the urban actors to come to them. It could bring the city authorities back to the core of developing their city. The most efficient datascares for architecture would be the ones functioning according to open source model as they were fed with the information from actors of different formalities.

<http://mlab.taik.fi/urbanmediator/>  
(datascape, self-organization, feed-back systems)

*Urban Mediator (UM) is a platform that provides a possibility to create, obtain and share location-based information that is organized according to topics of interests set up and maintained by the users themselves. UM uses a map-portrayal service. It offers a tool for generating and managing location-based information. This can be done manually via webpage or via phone according to the GPS-coordinates of the device. Urban Mediator can also connect to other systems such as city customer services, community portals or discussion forums, enabling the users to act both as citizen and as the city administration. The platform is planned especially for local use.*

*Through UM, for example, a biker can send in information on a certain location via phone to report a preferable route during exceptional traffic conditions. He might also ask the platform what information is available around the place where he happens to be. City might use UM to map information on new phenomena and the needs of unfamiliar cultures. It has been used e.g. to set up a search to locate the best places for new skate parks.*

<http://earth.google.com> (enrichable datascape)

*Google Earth is a freely reachable, though corporation sustained, datascape on the whole world. It lets you shuffle anywhere on Earth to view satellite imagery up to details of a buildings. It includes basic map facilities such as route searches and distance calculators, but, in addition, it can study terrain types or 3D-buildings. You can also explore the located content produced by WWF, NASA, UN or newspapers, save your toured places and share them with others. By changing layers, you choose the information you wish to see, from historic imaginery representing the changes of a certain area to weather broadcasts or of places of your interests. Google Earth also offers a tool to see panoramic street views as if you were walking on the streets yourself. User produced content is also embedded, as located Wikipedia-articles, photos, YouTube-videos, web cameras, stored GPS-tracks and map layers, for example. User produced content can be kept private, shared with friends or made open to the public. Especially when user produced content is shared among group members, it can become basis for design action*

## PARAMETRICAL DESIGN AND PLANNING THE PROCESS

Process planning can also mean planning the actual process. Here data and computational capacity are used a bit differently compared to planning with process in mind. The users and other contributors of different states of formalities become active participants of the design process, referred to as the semi-professional designers.

The generatively created bookshelf is an example of industrial design. In this project called Ranke, the designers have firstly planned a software that plays with both fixed and user-defined parameters of a bookshelf. Designers have also built up networks of production and distribution. Users download a picture of their wall on internet using the software. They then define the obstacles to the bookshelf, like a window for example, by drawing on the picture. In other words, users provide the context information. After the parameters are set, software generates different alternatives. Users choose one, get a print of plans and contacts to the closest producer or build the product themselves.

▷ *Process planning. The upgrading of industrial buildings in Marshalltown can happen in a way that allows gradual development and user input. The raw space can be taken into use instantly after first minimum fixtures and updated flexibly according to personal taste or resources. Strategy lowers the threshold for getting started.*



The customization goes even further. The skeleton of the bookshelf has been planned so that the cardboard cover, inside which each book is wrapped when bought, can be attached to the bookshelf. Thus the cover becomes a holding case that can house only that certain book. The different books inside their specific cases pinned to the user-generated skeleton, ultimately create a unique representation of the user in a form of a bookshelf. The customization goes even further. (Sauter, 2009)

By concentrating on parametrical design and planning the processes, the mass production becomes individual and the personalization has been left to the users. Variations from the same series become unique compared to an author-led process of a product once planned and implemented. When architecture reintroduces the processes of building that leave part of the personalization to the user, we are talking about one of the forms of open source design.

### **CLICHES AND AFFECTION TO INDIFFERENT AVERAGE**

The globalization of media is seen to produce and distribute even more general mass culture, in quality and quantity. We are afraid of ending up in a situation where mass information becomes too generalized and entertainment-oriented. In addition, just the pure amount of information can become suffocating and though difficult to approach.

However, the new media as open source

has the potential to be used as an innovation tool in which the mass of people affecting the information does not generate the content of consensus but provide specific kind of information managed by particular subcultures.

Statistics looking after average are easily misleading. Who is this actor called the average? What is the average lifestyle? Presupposed common culture does not exist anymore. As mentioned earlier, our culture is the one of high specialities. Standards should be used when they are building the base on which the personalization is then founded. But statistics representing qualities of the average cannot be the basis for planning.

Individuation is too easily misinterpreted as being the opposite of community building. We tend to search balance and well-being through homogenizing, melding cultures and by standardizing our surroundings. In other words, we look for consensus. However, in the P2P organization the community building itself is actually creating high individuation. The interaction in these self-chosen specific groups provides meaningful existence and therefore well-being.

Social psychologist Kosonen demonstrates the same by stating that acculturation does not mean identifying oneself with the main population. In her studies, the young Vietnamese immigrants who now live in Finland but have maintained also their Vietnamese culture, felt themselves more in balance than the ones who had completely adopted the western values. (Kosonen, 2008)

### **RELATING TO INFORMATION OF INDIVIDUATED INTERESTS**

Through computational capacity, incredible amounts of information can be gathered, handled, generated and shared. Maybe one paradigm change lies, nevertheless, in the realization that even if we can manage all that information, it is not always necessary. More important than being fascinated about the pure amount and specific content of information, we should look into developing the systems and processes of handling and using this information.

Maybe, as in the generative bookshelf, we should not be so attached to the information on what the obstacles are on each wall and in each design task. The focus could move towards the questions on how to develop the operation model for the design. In the case of Ranke, part of the operation model is the software that knows how to react on these specific obstacles. Therefore the detailed information on the obstacles of each context becomes less significant. We can leave the differentiated interests of individuals as their personal information.

### **CITY INTERFACING LOCATIVE INFORMATICS**

#### **NEXT STEPS OF INFORMATION SOCIETY**

At the Institute of Information Society of the University of Tampere, the next phase of global information society is seen as merging of information technologies, such as telecommu-

nications, with humanities. The latter including fields such as psychology, sociology and economics. In this interaction, the new media and new technology will find new uses.

The same will happen on practical scale. As we have this new culture as integral part of our everyday experience, the technology will gradually lose its absolute value. The use of new devices will be embedded to our practices. This will happen even to the practices that do not at the moment seem like needing any technology to complement them. (see Castells & Himanen, 2004) Open source can be regarded as a phenomenon of information society where media has found new uses fused to social activity.

### **INTEGRATION OF VIRTUAL AND PHYSICAL WORLDS**

The virtual world and the real world are fusing into one single reality. We call this a hypertext society. In this type of society, individuals move rapidly from one social milieu to another, choosing their ties freely and independently in relation to other groups. Identities, interests and social groups are scattered. Situations where activities take place overlap and interweave. Sociologist Ascher talks of n-dimensional places, hyperplaces, in which we simultaneously practice different activities in different social groups. Also the milieus differ with altering states of virtuality mixed to physicality. (Ascher, 1995)

City researcher Rajanti indicates to the same phenomenon with the concept of worm-

holes by which she means situations full of possibilities for jumping from one reality to another. (Rajanti, 2008)

Wormholes construct the networks of interaction and action that are not based on geographical proximity. A simple example of this is when one sits in a café with friends while following a football match on the screen, talking to the sister on the phone and greeting the boss passing by.

Our senses do not ask for total physicality in order to experience the space as real. With modern technologies the immaterial characters of hyperplaces are becoming even more prevalent. Our experience of the world is no longer based only on the traditional natural relations since a large part of it is mediated by this second system produced by man. What becomes of a city and architecture in this type of society? The new kind of global connectivity through hyperplaces alters the traditional spatiality. The concepts such as locality, distance and proximity obtain new meanings.

During Renaissance the perspective, a mathematical reconstruction of reality through geometry, offered the architects a new tool for spatial understanding. It affected the design methods and aims of the architecture of the era. Similarly now, the new digital tools are changing our concept of space towards the fused reality of virtual and physical. In this process of integration, the digital tools or devices themselves are not automatically more accessible or more open source. However, they promote and facilitate the P2P organization

that is the basis of open source culture.

Interestingly, this change of information society is spatial. The integration is about our experience of space and therefore it is in the focus of architects' field. With this in mind, we can once more state, that the open source organization model as one of the phenomenon of information society also affects our concept of space. In connection to that, we are presented with a more process oriented concept of space that stresses the production and acting of space. We cannot say yet what kind of a part the open source organization model will play in the merging of virtual space, physical space, information technology and practices. However, there are indications that this organization will be in the center of it.

### **INFORMATION SOCIETIES REMAIN SPATIAL**

After the birth of internet, some futurologists were predicting the disappearance of cities. It seemed as people would be completely liberated of any ties to real places and that the internet could replace all human interaction which before took place in physical assemblies. This did not happen. On the contrary, urbanization has sped up. The population and activities are on a global scale forming megacities. There they tend to re-organize regionally to form a heterotopic tissue of specialized nodes. Specific cultures accumulate to specific places.

For instance, an innovation think tank attracts people interested in the same field. It

fosters certain facilities and services, bringing up prototyping and production of the innovations. As the think tank specializes further, it becomes even more magnetic. One could imagine that the content providers for internet, for example, would be the ones truly acting free from physicality. Nevertheless, geographer Zook has proven that especially these experts have accumulated in certain countries, in certain cities and in an area size of a couple of city blocks. (Zook, 2005)

The existence and location of these clusters depends on their connections to global networks and to megacities. This enables the division of interest and production. The synergy of being physically near, the human face-to-face interaction, remains important. Therefore both the virtual and physical characters in different scales affect on the clustering.

At the end, the scale of human experience and physicality form the limits. We do not exist only in the abstract world but always also in a concrete place. Information age is not the end of the city but it is the beginning of a different kind of city.

### **ENHANCED LOCALITY AND SUBJECTIVITY BY SITE SPECIFIC LOCATIVE NETWORKS**

The new information technologies do accelerate the spread of mass culture. This mass culture promotes the generic non-places, such as airports and hypermarkets, suffocating the existing cultures and identities of specific places. Nevertheless, the situation could also be

the other way around. This now depends only on how the new media is used.

The features of the devices that support the merging of the virtual and physical realities are being developed even more adaptable to personal choice. Individuals can control their networking by selecting specific peers of social groups, situations or information that they want to grip to.

New local and site-specific networks are emerging. They are usually wireless and open. These site-specific networks base strongly on the structure and characteristics of the physical reality they are sprouting from. The network knows its location according to geographical coordinates. As one attaches information on the located network, the information becomes specified by its location. As an example, when we download a photo to a map service on internet and we attach the photo to a certain point on that map, presenting the place where it was taken, we talk of located information. The devices communicating inside the locative network are being developed to become location aware as well.

With virtual communication that knows its relation to physical space, we are able to attach invisible virtual notes and information to physical spaces, places, people and things. We can choose whether this located information is available to everyone, our peer group or to ourselves only. Located data can be labeled under categories or tagged to be found on physical site by search machines similar to already existing net-browsers.

We can use internet exactly the same way as before but now in connection to a physical

location. This phenomenon we can refer to as augmented reality: the qualities and cultures of a physical place highlighted by new virtual layers.

As stated before, the virtuality does not make the physical location indifferent to humans. On the contrary, the new locative media can enhance our relationship to the physical environment. This relationship can be private or shared, in the case of the latter supporting simultaneously community building. The important fact in both cases is that the subjective choice exists. This choice enables the individuation of city experience, which supports identity building in connection to a specific location. The process is a total opposite to people's alienation from cities caused by generic non-places.

▷ *Locative networks facilitate the local communication. Zee had the courage to start the production of special wines soon after having received plenty of interest according to a survey he did on the passers-by.*

*Maritha was one of the last women to move from her distant village to the megapolis. Once on her way to work her mobile pointed out a gathering it had noticed in a building close by. Proposal was based on the information that the gathering consisted of people from her childhood neighborhoods. She was thrilled to find a group that still knew the almost forgotten dance of her tribe she had thought she would never practice again.*

*A ten-year-old boy left an open virtual tag to a corner of a block in Delters about an idea of opening up the inner inner court of their block. A vivid discussion resulted eventually in an application for a collective grant from the city.*

*New stairs indicate that new villas will be built to the utilised roof. The screen similar to stock exchanges at the construction site communicates the quick jobs offered at short notice. It also informs about the small amounts of materials needed or to be sold as leftover.*





TAKEAWAY  
FOODS

DELVERS ST

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## VIRTUAL TAGGING ON PHYSICAL ENVIRONMENT

<http://stickis.com/>

*(explore virtual notes)*

*Stickis allows you to create little overlay notes on web pages and share them with your group. When you're browsing the web, relevant notes will appear on your stickis note tray. You can also alternatively check what locations your group members have pointed out. By stickis the conversation is everywhere, the way that people interact with the web and each other is changed. Unlike popular social networking sites which require users to interact with each other on a specific location only, Stickis allows users to interact with people of their networks anywhere.*

<http://www.bubbleply.com/Default.aspx>

*(add virtual layers)*

*Bubbleply is an interesting video annotation tool because it does not convert or affect the original thing on which you comment. It though makes it possible to add user generated content on any material found on the web, without restrictions. Bubbleply creates a new layer that it will broadcast on the original base material by request. The only information it needs is the location of the original material annotated. Sharing the new layers created follows basic P2P information sharing models.*

Bubbleply is easily applicable to locative networks and allows all kinds of layered virtual media annotation also on the physical world. Stickis facilitates the P2P navigation in internet. It could become a similar enrichment to our way of exploring the city. Annotation in general can be completely private but it is not only about personal layers of meanings. Virtual annotation can be used to point out things, to inform, to create reminders, to explain or to advise the people

moving around the city. It can also be a tool in collecting and editing information or sketching virtual plans. Virtual layers attached on a city space create a new interaction surface. In any case, the experience of the city is about to transform.

## MOBILE DEVICES AND NEW PUBLICITY

Understanding how we use locative mobile media will be as essential to architecture as understanding the way we lead our lives at home or move around in the city. Public places are the places for encounters, social activity and integration. Internet contains vast virtual public places. However, publicity on internet is still rather undefined. We do not know yet how to relate to the situation where even in the intimacy of our homes we are connected, not just to the people of our choice but to anyone. Through mobile devices and wireless open networks, this internet leaves the house and enters the city.

Cities have a chance to become the interface between virtual and physical public places. Buildings and places can become devices of networking and they can actively take part in content production. The features of a public place can be augmented to support new kinds of publicities. Cities become platforms that support new patterns of action. Networking can work against segregation especially if the interaction stays open source. As the devices to interact in this network are mobile, the situations of interactions are altering and the boundaries become even more blurred.

## INTERNET OF THINGS

In addition to the characters of location awareness, personalization and mobility the devices have become also intelligent. We refer to spimes, portable hybrid devices that in addition to all the basic qualities of a communication device act intelligently also on their own. They, for example, use the information they have on their user. Spime generates a profile of its user by learning from the situations where the user takes it. It communicates with the surroundings collecting and sharing data. The device stimulates interaction by prognosticating the needs of its owner. It proposes possibilities passing by to the user when moving around the city. This type of information can be anything from avoiding a traffic jam to suggesting a restaurant visited by a friend last week.

◁ *When passing by, the spime picks up a personal message that a friend had left to Kate. It points out the stairs to a new cafe that has the brunch women talked about last week. Boys heard from Twitter that the traffic is cut off for the next hour on their home street. They took the opportunity to test the new version of soccer they have invented to be played among cars in a situation like this. John is checking out the state of the plans for the expansion of the music center. He wants to leave a note to express his support and interest on using electricity produced by wind generators.*

Objects and things constitute an internet in which they communicate with each other. This internet becomes an ecosystem of intelligent, dynamic and responsive environments. Recycling the resources of a city becomes easy since the urban systems find the leftovers of each other. By planning these systems of intelligent environments, plenty can be gained from little material resources. The combination of these new features of the web is also referred to as the internet of things.

As an example of the possibilities brought by the internet of things, buildings or individuals can do emission trading. We can each have a stack of carbon points as a capital that allows for certain amount of carbon dioxide emission. If a building does not need its carbon points, it can communicate the will to sell them in the internet of things. A park could produce carbon points to be sold, as it harvests and eliminates the carbon dioxide. The concept of emission trading aims for finding balance between systems' emissions and neutralizing capacities.

At the moment we are thrilled by the possibility of using the computational capacity to create structures to buildings that optimize the response to dead forces such as gravity. With the internet of things, the same capacity could be used to interpret the real time data feeds from the environment. The structures could then react to live forces, such as temperature, wind or light, thus, mimicking the way flowers that turn to face the sun, for example.

The structures could also respond to situa-

tions, such as availability of electricity. A building that produces energy could balance between the general network and personal stock, according to changes in the environment, such as prices of electricity or a sudden need for extra power for the household.

<http://www.pachube.com> (open platform for systems)

*Pachube is an open platform to construct the internet of things. It can be referred to as a Facebook of environments. Anyone can send in a real time data feed and anyone can connect or react to any of these feeds broadcasted. Data can be anything from following the electricity consumption of an apartment to the route of a bicycle. Information can be both location and time based, managed through different groupings. New applications on how to input data are emerging daily as also the ones on how to react to output or visualize the information. Input can happen, for example, via simple sensors, meters or telephones that are connected to internet. The reaction to data can happen among others in maintenance machinery, robotics, visualizations or models of 3D-software. Pachube brings the scope of planning the systems to a new level, especially, because of being an open platform. It enables the informal unplanned collages of interaction.*

## INTELLIGENT USE OF BASIC DEVICES

We can use also basic devices in constructing the internet of things. This aspect is interesting especially when referring to development co-operation. Any simple telephone can be a remote control to a computer located in internet. Text messaging, calling and dialing, even the sound of a human voice interpreted by a computer at the other end, are sufficient means to communicate with the remote computer. The in-

formation can come back to the telephone from the computer in all these same formats.

In Africa, the illiteracy is still common and many languages do not yet have a written form. Thus the possibility of accessing and managing a wikipedia-type of a facility by speaking, recording and listening is exciting. Basic devices are already location aware. Our current telecommunication networks provide the operators with the geographical coordinates of where the calls are made and messages sent. To use this information, the operators only need the permission to read the locations. (Poikela, 2009)

Simplifying the mobile devices to remote controls has been enabled by the changes in the way internet is organized. In the 1990's, internet served mostly the universities. By the year 2000 we searched content from the web on our personal computers. In 2010's, the programs will run in the web instead of being installed on our home computers. We will also be working together on the same tasks, simultaneously with each other in shared virtual workspaces. Thus both the software and hardware will be vastly distributed and highly accessible via internet.

Internet is being transformed to a world wide computer or as simply described, to a cloud. The cloud will offer to its users everything that was previously found on personal computers, then mostly in open source. The computational capacity will be globally scattered, both to small particles which unite when needed as well as to huge data centers.

<http://mobiled.uiah.fi> (simple devices integrated)

*Mobiled aims to create mobile learning environments enabling access to remote computational capacity with basic devices. The initiative concentrates on concepts, prototypes and platforms of how mobile technologies could be used for empowerment of students within and outside the school context. The target is to design and develop two products, the box of mobile tools and the technology platform, available for anyone to use. The interest is, in particular, in voice, speech and language technologies.*

<http://lukimat.fi> (literacy via mobile phone)

*Ekapeli is a learning game that trains to differentiate phonemes from each other by the help of letters. There is a non-commercial simple mobile phone version under prototyping for developing countries. In Finnish a letter equals a phoneme. Ekapeli is applicable to Finnish as well as to African languages, especially because of that. The languages that are at the moment just finding their written form usually base it on the analogy of phonemes and letters.*

The locative network system itself can be built up by utilizing all devices available at its reach. This enables a sustainable gradual change from basic devices towards more intelligent ones. Therefore the distributed hardware parts of the network do not need to be replaced before their natural lifespan comes to an end.

For example, the automated traffic system, referred to also earlier in this thesis, can use cars as mobile sensors. Cars are full of technology and computational capacity that can be used to receive data. In addition to that, they are able to transmit information. This new usage would complement the traditional system that is based on GPS-satellites and static internet devices on ground.

With a more intelligent traffic system, we can gain energy efficiency, better safety and less congestion. Intelligent traffic system also supports the individuated public transport. In this model, the public transport no longer consist of only big vehicles that transport many people simultaneously, but of separate vehicles of a public domain. In Europe, public bicycles are already commonly used to construct individuated public transport systems.

Single common vehicles can act independently in the outskirts of a city. There their use is similar to the way we now use our personal cars. One could order the closest vehicle available at the door when needed. With the automation of the internet of things, the vehicles can move around by themselves. Closer to the city center, the vehicles could become more automated, reacting to information from their surroundings. They could, for example, automatically platoon to form trains as encountering more traffic, thus ensuring the fluidity of masses. (see Canou, 2009)

The traffic system described above promotes and reflects P2P society. It also demonstrates the operational structures enabled by discussant locative network systems.



**THEME 2**  
**PRACTICES IN PRODUCTION OF (THE OTHER) SPACE**

## PRODUCERS AND PRACTICES

### ZOOMING IN ON THE DERIVATION OF GENERAL BUILDING

Cities are conditioned by the general built context. Therefore, as architects we should be highly interested in the basic building production. Yet, it is easily ignored. Concentrating on high points is a common human characteristic. For example, we perceive history through benchmarks, such as wars, and the general development of the era stays at background.

Similarly we focus on personification. It is not to be seen as a negative thing as long as this is not done on the expense of the overall context. For example, we rarely appreciate an anonymous piece of art. Still, an unsightly work done by a renowned artist receives admiration. This tendency is reflected in architecture as well. We easily value buildings more through the personal history of an architect-artist than as parts of the development chain of the local culture.

The methodology of open source enables to retouch the practices of general building. Open source is able to produce a very large amount of applications, even more than the prevailing mass production methods. These applications have the possibility of deriving from the local general building but also becoming unique as customized by the general user.

In order to understand the derivation processes, there is the need to recognize the phases of derivation. In regards to general building, the modernistic production of space has

been experienced problematic. It is no longer relevant to separate functions or to believe in standard solutions, since these categorizations are based on the imagined average culture that we have found not to exist.

The easiest way to deal with the challenging legacy is to ignore it. Another way is to declare the modernistic practice as the wrong answer. Both approaches simplify the situation too much. Modernistic planning is still strongly present and despite its mistakes, it belongs to the development chain. Building upon it or using its mechanisms of production prevents us from starting from scratch. Following the idea of constructive laziness, it is easier to start from a good partial solution than from nothing at all.

Philosopher Latour emphasizes the concept of historical continuum. According to his theory, the previous cultural phenomena tend to continue their existence living as contemporary subcultures embedded in the prevalent culture. (Latour, 1993) Therefore, a sudden shift from one organizational model to another by total extermination of the previous one is not possible. Neither is it aspired. As an evolutionary design method, open source sees the previous phases of derivation as essential starting points.

### INNOVATION PROCESS REVISITED - DEATH OF THE AUTHOR

Open source method creates the need for a different interpretation of the concept of innovation. The existing cathedral model with the autonomous genius of a chief designer, at the top

of a strict hierarchy, is a closed model based on competition. That competition has proved to be an important generator of innovation but it also leads to fragmentation of information. Architects constantly reinvent and reuse designs.

Still, the mystified notion of a unique artist-author creates the imagined need for architects to always invent something completely new. To have references or to declare the sources of inspiration is easily misinterpreted as stealing someone's rights on one's intellectual property.

Architect Alexander promoted the idea of design patterns. According to him, architecture constructs of endless combinations of existing solutions. It is interesting how the first wiki-platform developed by Ward Cunningham was actually based on these concepts of Alexander's pattern languages. (Castells & Himanen, 2004)

Open source presupposes that ideas are disclosed and made available to others who then in turn can improve them. In this way, design changes from a one-off action into an evolutionary collaborative process. This comes close to the existing working methods of product designers. They consciously build up a study process to develop a product. The process includes research on user's needs, working with the user and various generations of prototypes at different stages. The innovative part is strongly data based.

Product designers make a distinction between the information the user gives as a subjective opinion and the information that can be gathered and analyzed more objectively. Products are reactions to specific situations. They are the applications of the phase at hand. As



a contrast, an architect striving for unique performance traditionally works on a project that is based on the roles of the one who orders and the one who produces.

## **BLURRED ROLES**

Open source blurs the orthodox roles of design contributors. The distinctions between audiences and performers, users and designers, occupants and architects become vague. In this conception, people have the possibility of becoming designers of their own spaces, architects designing the meta-systems.

Metadesign means the designing of designing. This enables the semi-professional design activities. In this context, the word semi-professional refers not only to an end-user, but to other actors such as hobbyists as well. The attention of a professional designer is now focused on the resources that a design should provide to its users in order for them to produce space. The aim is to incorporate the semi-professionals into the process of designing.

Increasing the design capabilities of the semi-professionals makes them active problem solvers. In addition, they become more conscious demanders of quality. Open source model in architecture has the capacity to be more productive in quality and quantity than the prevailing practices in production of space. It could offer both better basic building as well as better top architecture, as the result of accumulating best design solutions and newest information.

All the above mentioned brings us to an interesting question. If everyone becomes an ar-

chitect, does it not mean that, without distinction, no one is an architect anymore? However, design happens in different states of professionalism and formality. Driving a car every day still does not automatically make us all Formula 1 -drivers.

## **ARCHITECTS ARE STILL VERY MUCH NEEDED**

In theory, the open source system is open enough for everyone to contribute to it. Still, in practice it does not mean that everyone becomes a programmer. The professional skills of a designer will stay valued. There are still those who enjoy the system for the challenge of building a new code. Others enjoy the fruit of open source culture without the need to affect the machinery itself.

The comprehension of reality is never neutral. Interpretation is always a dialect between the interpreter and the object. The reader has personal intentions and capacities to understand the object which, in turn, bears specific characters to be interpreted. An architect has special insight to the built environment. Humans in general also have a pattern-recognition capacity that enables us function as catalytic designers, partly relying on our intuition. In other words, no computer, no internet of things, will ever be able to replace us completely.

It has also become very clear that one cannot code from the bottom-up using the bazaar model. One can test, debug and improve following the bazaar style but it would be very hard to originate a project. The developer community

needs to have some inspiring ground material to test and play with. (see Raymond, 2002) Therefore, the role of initiators and project coordinators remains essential.

Open source software development also highlights the aspect mentioned above. Coding itself is nothing but solitary action. The power of open source lies in how this individual activity is harnessed and organized. The best open source processes have started from an individual vision and been amplified through the efficient construction of voluntary communities interested in the subject matter. A process does not just run on itself, it requires maintenance, some sort of guidance and inspiring input. Thus the open source model in itself already contains the combinations of different operation models. A project can also have different phases, of which some follow the bazaar model and some a totally different model.

## **INCLUDING INVISIBLE URBAN ACTORS**

As mentioned earlier, the majority of our cities consist of something that we refer to as a building industry or building production, not as architecture. Ignoring this major part of the city, we architects firstly alienate the majority of people from us. Secondly, we detach ourselves from the mechanisms where our cities are built. Architects become invisible.

Open source offers an interesting tool for including the urban actors that have become alienated from the old fashioned communication methods. For example, young people often lack of interest to take part in traditional inter-

action. Internet is a central part of their daily culture. According to law, the formal decision making excludes them as minors. Open source functions by the devices young people use and it allows the different states of formal and informal. There are also other invisible urban actors. Overall, the individual has been subdued so far since we have not been able to generate systems, through which the diversity of individuated information could be used.

In developing countries, the outsiders are often the people without legal citizenship, passport or identity papers. They are the refugees, asylum-seekers and AIDS-orphans. In the eyes of the authorities they do not exist and therefore cannot use the formal participation channels. In spite of all this, they are powerful urban actors due to their existing networks, local knowledge, unused capacities and vast amount.

Open source functions by including both formal and informal actors. Cathedral innovation model instead contains only the most talented minority as the developers. The majority competent in many other ways is left out. These semi-professionals nevertheless surpass the capacities of the few wizards if their information is just skilfully spotted and accumulated.

Urban planning has acknowledged the existence of banal non-places like supermarket clusters or traffic environments. We admit that it is important and even fascinating to take them under focus when planning. Similarly, the people defined before as non-people should be acknowledged. There should be no separation to legal and illegal citizens. This would create a more realistic view on the urban actors.

## SCALES OF ACTORS AND ACTIONS

In Africa, even the well-meaning leaders have caused great problems. Julius Nyerere, the respected former Tanzanian president, sincerely hoped to improve the well-being of his people by forcing millions of them to giant collectives. Instead, he almost destroyed his country's capacity to feed its people by creating a system of only large production units. When these units failed, everything collapsed. (Guest, 2004)

Until recently, the prominent donors have also been keen on financing large, showy projects such as constructing dams. The same problem of acting on large scale is visible in public housing development projects in Johannesburg. These projects try to meet the desperate need for excessive amounts of accommodation by large-scale projects that require big vacant spaces in order to be realized. The projects are therefore taken to the outskirts of the city where no other facilities exist. As a consequence, problems such as the high costs for commuting to work appear. Construction of such scale leads often also to a numbing repetition of one housing type. These areas need plans for diversification soon after being finished.

The amount of results can be impressive through multiple actors performing small actions. Especially, if the actions are based on accurate knowledge of what is the sensible way to act.

In 2006, a project of Health Habitat by the group of Paul Pholeros studied the water consumption in the desert conditions of Tangentyere, Australia. Their aim was to minimize the consumption. The project was carried out among

185 households of poor indigenous people. According to the general opinion the study was not needed. Instead there was the common belief that these people would simply need education in water management in order to gain results.

Nevertheless, the research showed that losses primarily result from poorly installed and maintained infrastructure, not from overuse or misuse of water. As a reaction to the study, action was taken simply to fix the leaking taps and household water tanks. Work was done mostly by the locals themselves after some instructing. As a result of the study, also groups to maintain the infrastructure were formed. Realization of the improvements was inexpensive but the consumption of water was cut to less than half of the previous. In this small community, 100 million liters of water were saved annually. All this was achieved without slightest changes in the consumption patterns of the locals or investing in expensive technology. (Pholeros, 2007) (Tangentyere Council Inc & Healthabitat, 2007)

Open source functions similarly by small actions accumulating to form a large effort.

▷ *The township of Diepsloot is one of the attempts of the City of Johannesburg to meet the massive needs for housing.*





## WHEELS TOO HEAVY

Nelson Mandela still determined to criticize his once righteously acknowledged but since sidetracked political companions: "Little did we suspect that our own people, when they got the chance, would be as corrupt as the apartheid regime." (Barrel& Seepe, 2001)

It is not exaggerated to say that in development co-operation we have the need to target the resources straight to the small-scale actors. The open source operation model could be a tool used in this. In 2000, around 27 000 cases of corruption were detected in the Eastern Cape area of South Africa. (Heath in Guest, 2005). In 2006, the auditor of the national accounts of South Africa discovered that national departments incur over 266 million South African rands (23.3 million euros) per year in unauthorized irregular expenditure. (Roopnarian, 2007)

Efforts by other countries to solve Africa's problems have over the last few decades been unsuccessful. The resources are lost to the bureaucracy. As a matter of fact, Africa has only grown poorer over the last thirty years. Few studies have found any robust links between financial aid and faster growth. Countries receiving considerable donations do no better, on average, than those receiving practically none. (World Bank, 1998)

Countries that do prosper tend to do it by activating their own processes. Open source functions by small scale actors activating their own processes.

It has become apparent by now that transporting material aid is neither the answer to

the problems. For example, a ton of corn imported from the U.S. costs six times more than facilitating a local farmer in Africa to produce the same amount. (Ämmälä, 2009)

Lighter application models are needed for all actors involved in the development co-operation. In Kenya, the government of Kibaki has ironically stated that although the country receives plenty of aid, it has difficulties to find time to use it. The ministers have to continuously receive the delegations of donors to explain what their plans are concerning these donations. (Guest, 2005) Using open source organization the facilitators do not anymore need to be interested in all the detailed information of the specific context of implementation.

## SCALE COMBINATIONS BY OPEN SOURCE

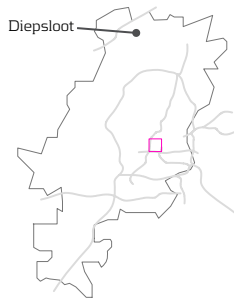
To sum up, open source sees also the executive power as a rhizomic network. The power is increased through the actions of individuals. The network forms a kind of ecology, a collection of agents that can have different aims. As long as these individuated agents attempt to maximize the utility of the open source machinery, this process produces a self-correcting system.

In addition to the individual scale, open source needs the scale of global interaction. The information basis needs to be shared in order to enable the distribution and specialization of production, be it material or immaterial. Mass production mechanisms are still a necessity. Let us imagine building a house with our own hands, using the skills we possess and

◁ For example in Diepsloot, there are approximately 150 000 residents living in an area of about 5km<sup>2</sup> intended to serve only as a temporary transit camp in 1995. In a multicultural township like this the people do not often have a common language to communicate. The battle of survival possibilities among the poorest refugees burst out, for instance in xenophobic murders and violence in the conflicts of the fall 2008.

density in Diepsloot is approximately 2895 residents/km<sup>2</sup>  
(South Africa 36/km<sup>2</sup>,  
Finland 17/km<sup>2</sup>)  
which leaves space about 35m<sup>2</sup>/resident

unemployment >50%  
HIV/AIDS ~50%



the material we find from the nature surrounding us. Now let us compare that idea to co-operating with specialists of different fields. The contemporary building is compounded from elements that are built in a network of multiple people and places around the world.

Mass production can be individuated through different ways. Large-scale actor can take the role of an enabler by leaving part of the realization to be carried out by the individual. The expenses of implementation are divided between the large-scale actor and the individual. This generates several supported kick-offs from the same original resources. The responsibility on realization is also distributed. One actor blocked will not paralyze the whole tissue of actors.

One option is to utilize the capacities of recent technologies. It has become as easy to mass produce unique products as to continue copying the same solution. The design of unique mass products uses the latest software, based on parametrical planning featured in the project Ranke. The framework of a product is pre-decided but some parameters are left undefined to be set in according to each application. The prefabricated houses follow parametrical planning as the user chooses some of the characters of the house. It is a poor example, compared to Ranke, but it describes how far behind the practice of architecture is in planning systems. Individuated mass production still relies simply on combining prefabricated elements. Nevertheless, parametrical design will soon profit from the large-scale 3D printers that are at the moment capable of printing uni-material models and computer parts.

Autonomy as self-organization should not be a threat to large-scale actors. Networked self-sufficiency supports also the functionality of the large-scale. Production of electricity, waste management, water harvesting and even food production can all happen in small units inside the city. As networked and summed together, these small inputs can form the large-scale facilities needed.

### COLLECTIVE ACTION MODELS

P2P production sounds like a novel concept, but it is actually the same organization model that has been practiced in the countryside for centuries. People possessing specific skills, resources or tools and sharing the same interests come together to work on something they could not manage on their own. During the harvest time, households harvested the crops field by field. One had the machinery for cutting the crops, others had the tools for processing the grain.

The P2P production of today happens in the multidisciplinary workshops by hacking, remixing and prototyping. Another term used is open source production, where the material products are built through the open prototyping. All the designs and information are available online for free. Practices of open source production are still vague and juvenile but some results already exist. The Riversimple hydrogen fuel cell car technologies have been developed by open prototyping. The cycles of collective designing and implementation spurred the prototype to the top of the small car industry. In addition to technical innovations, the developers succeed-

ed by P2P prototyping in keeping the costs of the end product minimal. (Palmer, 2009)

The collectiveness of open source supports prototyping. There are more resources through the collaboration for the idea iterations as well as for the implementations. Money and other resources reserved for prototyping are not wasted, as the innovation part itself cuts out the most unpromising development branches. Someone in the team of multiple co-developers notices quickly a possible problem. As open source is a model strongly driven by existing demands and personal practical problems, the focus of study naturally lies in what is worth prototyping.

One of the best known folk theorems of cathedral model software engineering is that 60 – 75 percent of conventional projects are either never completed or rejected by their intended users. This happens mostly because the developers lack the personal interest and insight to the issue. (Raymond, 2002)

▷ *The production distributed to small units eventually accumulates city scale facilities, like urban agriculture for alimentation or solar power for electricity. The units are networked into a tissue-kind structure. This allows gradual and minuscule step-by-step implementations. The tissue is capable of including extremely diverse units which then can meet specific needs. The units can also be less or more technically advanced, depending on the resources of the realizer.*

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## SHOWCASING THE POSSIBILITIES OF OFF-GRID SOLUTIONS THROUGH AN EXAMPLE OF WATER MANAGEMENT

Johannesburg, built on a ridge, is one of the few megacities in the world that is not located near a large water source. This means that potable water for the region, which is purchased mainly from Rand Water, has to be pumped about 50 km from the region of the Vaal River.

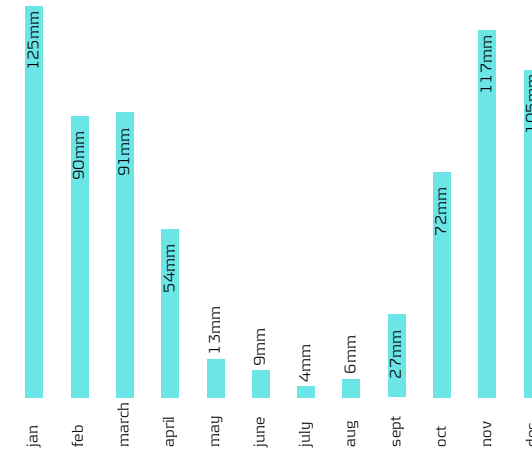
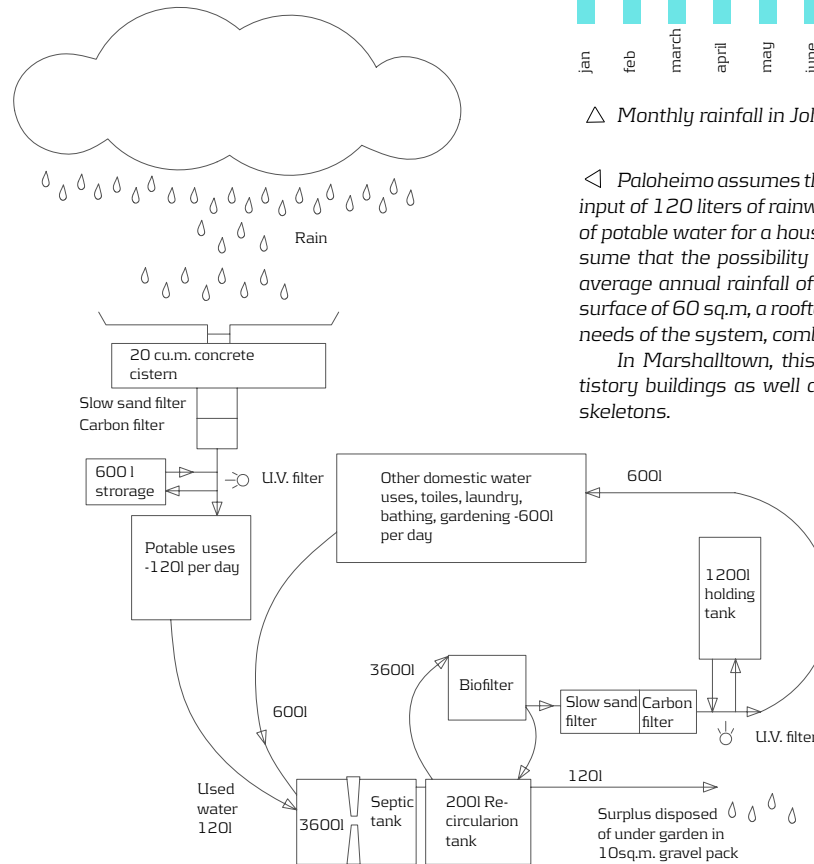
However, the yearly rainfall, 713mm, is 40% more than that of London. The winter months from May till September are the challenging ones in Johannesburg. (Johannesburg, 2008) The infrastructure for water in Marshalltown needs to be completely rebuilt. The distributed water harvesting with distributed storing could noticeably assist in water management. Water could also be stored in large common tanks in the former mines beneath the city.

### Toronto Healthy House Project

The Healthy House System is a complete off-grid water treatment system. It is based on water harvesting, production of potable water, reclaiming water from sewage and disposing the surplus to urban agriculture, for example. The prototype was built in Toronto, Canada, already in 1996. It serves a household of 4-5 persons in an urban environment. It is constructed in four stories to a plot of 7x24.5m. Prototype is also self-sufficient in energy, mostly working on solar systems. The system can reduce water consumption up to 90% or even more if the modern consumption patterns are challenged. It meets all the quality and safety standards of our days. It can be used wherever water is scarce or expensive. The costs are also competitive, in fact, even lower than servicing new subdivisions in many cases.

The rain water harvesting system is chosen for potable water supply, since rain is often a less polluted source of raw water compared to ground water in an urban environment. Once water has been used it becomes wastewater. All wastewater, grey and black, is combined and treated together as a closed system. The system uses natural biological treatment processes to accomplish water reclamation. It uses very little energy and asks for only a reasonable amount of maintenance.

An interesting effect of reuse is that the water conservation actually becomes less of an issue. The use of fresh water is the main concern. In the case of Toronto, fresh water is used only to drink, cooking or washing the dishes in kitchen. All other fixtures use treated wastewater, therefore, the increased use of water at fixtures that consume reclaimed water only increases the number of times that wastewater is reused. (Paloheimo, 2006)



△ Monthly rainfall in Johannesburg

◁ Paloheimo assumes that his system would require an input of 120 liters of rainwater per day to meet the needs of potable water for a household of 4-5 persons. If we assume that the possibility to store water exists, with the average annual rainfall of Johannesburg it means that a surface of 60 sq.m, a rooftop for example, would cover the needs of the system, combined with a 10 sq.m. garden.

In Marshalltown, this could be applied to new multistory buildings as well as to reviving the old industrial skeletons.





We could imagine that when working collectively and following the bazaar model, in which no one has been given a specific task to concentrate on, there would be plenty of duplicated work and though loss of efficiency. Nevertheless, this almost never seems to be an issue. Bazaar model aims to gain quick corrections to the object under development by releasing the kind of intermediary print-outs of the innovation as often as possible. This releasing-often policy minimizes duplicated work.

A highly networked society is able to gain more with less by sharing resources more efficiently than a society with fewer networks. Shared luxury facilities, plug-in offices, workshops, tool libraries or networked and distributed housing are only few examples of resources put to full use. We do not need to own cars since a vehicle fitting our daily changing demands can be ordered when needed. (see Stadtmobil, 2009)

A development project has more resources and becomes more possibly implemented as also the expenses of establishments and maintenance can be shared in the network of actors and contributors. Therefore, the network can be used to gain the basic facilities. At the same time, it provides a pool of specific facilities. For example, it is not possible or sustainably reasonable that we all own thousands of books but through the networks, a particular publication is easily attained.

Networks are also used to create more inventive production chains. For example, material things can be realized in the vicinity, instantly as the demand occurs. This minimizes the need for storage or transport of goods. A

provider can also highly specialize and still find customers from the internet.

<http://arki.uiah.fi/adik/dailyworks/background.html>  
(community self-organisation)

*Dailyworks provides digital tools for the everyday practices of small communities. It has been developed to facilitate new kind of housing for elderly. It is based on helping among the neighbors and self-help. Through the toolbox, the community members can e.g. share a calendar, allocate and manage household issues, reserve common resources, such as spaces or machinery or take part in collective shopping.*

<http://www.efatland.com/portfolio/>  
(community decision-making)

*WebTing is a web application that enables democratic decision-making in online communities. It emphasizes the open and informed discussion that precedes a decision. The process of decision-making is divided to phases of exploration, discussion and vote. An issue has to meet the requirements defined by the community to proceed to the next phase. By managing their user-profiles individuals can contribute especially to the issues of their concern, filtering other discussions to the background.*

## SPACES IN THE CORE OF DEVELOPMENT

### UTOPIAS AND HETEROTOPIAS

As the futurology is interested in what yet is not but what could be, this brings us to utopias. They are sites with no real physical place. Still, they present, reflect or invert a real space and a situation of society in a perfected form, as an intention or a dream. Utopias are a tool

in imagining a path towards a state in the future that is desirable.

There are also places that play a role somehow similar to utopias but which are real and exist especially through their context in time, place and culture. These heterotopias, a concept presented by philosopher Foucault, have the curious property of being in relation with the sites of their context in a way that they suspect, reflect, neutralize or reinvent them. They are actual places but at the same time counter-sites fostering counter-cultures. (See Foucault, 1984)

Term heterotopia in medicine refers to a group of alien cells living within a host cell or tissue without harming it. It is a formation of a tissue in a place where its presence is abnormal.

### GENERATING THE CONCEPT OF THE CITY

Heterotopias do not form an unambiguous group but they can be identified by the functions they have in relation to the surrounding space that they are reactions to. Firstly, they create a space that exposes the general space. They are the mirrors that give us the visibility of ourselves and our environments. Things exist through having their opposites. They are defined as different units by not being the same.

We understand that we have a left hand and a right hand as we see them both. Heterotopias can be used as a tool to perceive and reinterpret our existing majority of society. They help us in questioning our rooted habits. For example, living in a room of 15m<sup>2</sup> for a year with a friend and enjoying it, arouses doubts on the before-imagined

need for possessing plenty of personal space.

According to psychologist Lacan, mirror is an essential tool that enables infants to realize and conceptualize their identity as a whole person with a body that can be identified as a whole, beyond its parts. The sense of being an individual depends, both on the separation from others and on the feedback mechanisms, such as social groups or the mirror. This feedback enables us to construct ourselves further on as social beings in relation to others and to our environment. Mirror functions both for separation and feedback. (Lacan, 2001)

The heterotopias give us, the urban actors, chances to identify ourselves, our needs, our surroundings and our relations to other actors in the process where we are also constructing our understanding of the city. The virtual mirror spaces of locative networks, with their enhanced open source feedback systems embedded to the built environment, will act as heterotopias that assist in generating the concept of a hypertext city.

### **ROLES IN FACILITATING AND MONITORING CHANGE**

Heterotopias contain the rejected elements; they are the places of exclusion of exceptions. This hosting of the opposites is a task necessary to construct any urban system. Each system maintains as a minority also the other systems that follow a reverse logic to theirs. There are the heterotopias of crisis, discipline and compensation. They present especially the negative features of exclusion. However,

the interest in facilitating positive development is more about heterotopias with features of freedom and illusion.

Architect Shane suggests that heterotopias help to maintain the city as a self-organizing system. They either keep up the overall balance by housing the exceptions during stasis or they can be seen to facilitate the dynamic imbalance in rapid shifts between urban paradigm changes. (Shane, 2005) The heterotopias of crisis and discipline are slow-changing and have rigid internal orders but the ones of illusion adapt rapidly and flexibly.

### **TRIGGERING DEVELOPMENT AND ACTION**

Heterotopia's role is also to create a space that is other. In this thesis, I concentrate on the concept of otherness especially when it demonstrates its positive features. The positive otherness serves as a great source of imagination and freedom. The negative otherness refers to alienation, segregation and exclusion.

Positive other spaces can act as laboratories, testing fields. They are the places that allow and catalyze new actions, new culture and new ideas. The capacity of positive other places to trigger new action is enhanced by their appearance as spaces that do not assume or inhibit any specific culture. These positive other spaces are, in a way, neutral compared to the society in general that is full of meanings and rules manipulating our choices. Heterotopias also often bring in something unexpected that inspires to break the habits of assumed normality.

Architect Fujimoto talks of persuasive places that require invention and exploration in order to be used. In their spatial order, they do not propose any absolute pattern of behavior. We are free to recreate the patterns. Nevertheless, the persuasive places are far from spaces without personality. On the contrary, they are inspiring by their excessive oddness. Their characters differ from the majority of places. (see Fujimoto, 2008)

The concept of persuasive places can be demonstrated with a metaphor of shelters. A cave and a nest are two opposites. A nest is made for a special function, nesting. Its exact definition can become a restriction to other functions. It can also become monotonous if standardized and mass produced. A cave, on the contrary, asks for discovery of the function. In a cave, we can find our own attachment to the place by the action we choose. Following the same logic, why does a staircase have to be only a set of steps or a roof precisely a roof? Why should we settle with the Existens Minimum? And going back to the concept of non-existent average, whose Existens Minimum would we be settling with in the first place?

Similarly, a city can have the features for becoming a landscape for the people to explore. Why not to have a house composed as a city or a city in a form of a scattered house? We could have places where you are in public but simultaneously strangely inside your home.

Libraries could go to streets, a building could talk or randomly swapped virtual notes could turn our accustomed routes around. Latour also sees these not clearly defined situations

that are somewhere between the familiar and strange as primary sources of progress. (Latour, 1993)

## INCLUSIVE SPACES

As mentioned earlier, heterotopias as alternative places include other people and other subcultures. These inclusive features of heterotopias can be used intentionally to blur the segregation. We can mix places, people, functions and modes of operation, for example. We are eager to exclude the other cultures mostly because this other is not familiar to us. Simple adding of interaction and soft collisions might lessen this prejudice.

## DIVERSITY OF HETEROTOPIAS

As noted before, heterotopias exist through their relation to certain time, place and culture. An existing heterotopia born in one context for one purpose can continue to function in very different fashions as the society around it changes. For example, a museum is a heterotopia that was born for the need of collecting and classifying information. Nowadays, it has been transformed into a venue of cultural happenings. A museum is also a medium, a neutral place, to discuss challenging issues through art. Even if the characters of a museum have changed it still stays as a heterotopia in the continuum of western society. For a different society, already the situation, where the first concept of a museum emerged, might be unfamiliar.

Heterotopias' relation to time can be seen

through the role that heterotopias often play in long evolution chains. They also represent sudden time-specific actions. For example, temporal transitory festivals, like football matches or demonstrations, create a situation of otherness to a city.

In service of its functions, the forms of heterotopias are diverse and constantly in a state of change. Therefore, it can be confusing as there is no single appearance under which heterotopias perform or can be distinguished. In addition, the conceptual model of a rhizome city allows for all the previous conceptual models of the city to coexist. As parts of the rhizomic tissue, they carry along also their own heterotopias that are typical to them. Thus the diversity of heterotopias only increases. However, some types are always more dominant and characteristic to certain context than the others.

## MUTATIONS TO DNA OF THE CITY

In Darwinism, mutations are changes to the genetic material of an organism. They create variation within the gene pool. Less favorable mutations fall off by natural selection while more beneficial mutations may accumulate and result in adaptive evolutionary changes that are necessary for the continuum of a species.

Heterotopias indicate the future. They can be seen as mutations in themselves or as generators of mutations. Following architect Shane, recombinations of the DNA of the city include violation of the previous system, which produces mutations. (Shane, 2005) Support-

ing heterotopias is an act similar to supporting risk taking. Studying heterotopias would be a key to recognition of the promising mutations important to the city development. Not only recognizing what is the heterotopia of the context, but also where, why and how it functions would reveal us a lot.

For example, the changes in the location of heterotopias, in relation to the general city structure, have always taken place during major paradigm shifts. In medieval organization model, the heterotopias existed mostly as closed cells inside the tight city structure. In the shift towards the functionalist machine city, they indicated the expansion and dispersal by being among the first elements to escape outside to the suburbs. The reorganization of the splintered city to a rhizomic tissue was anticipated by the redefinition of existing clusters and emergence of new nodes. There the heterotopias of multifunctional hybrids prevailed.

Most definitely there are several types of heterotopias foretelling the future at this very moment. Nevertheless, some really interesting ones exist where the merging of virtual and physical worlds is accelerated by the locative networks and the culture of open source. Open source itself creates another operating environment compared to prevalent mechanisms of production of space. It generates the other solutions, such as mutations to genes and heterotopias to a city.

*Not precisely in the house. ▷*



## CLOSER ON HETEROTOPIAS OF FREEDOM AND ILLUSION

In the past, the heterotopias of illusion have been dismissed. Following the interest of Foucault, the concentration has lingered on the heterotopias of deviance. Heterotopias in their various forms hold both positive and negative features, both with differing emphasis. Our interest could lie more in the positive ones. Foucault saw the illusionary places mostly as places offering escape from the brutal reality. Even Shane presents the contemporary heterotopias of illusion mainly through rather negative examples. In these examples, the aim is to sell a certain fake illusion to as many as possible. He talks of the image-building of marketing, of consumerism of multinational corporations or of tourism to surreal theme parks. These illusions are supported by globalized mass media.

However, fantasmatic is ubiquitous to humans also by Foucault. Illusion should not be taken only as something less real. It can also be interpreted as a synonym to the virtual and conceptual. In connection to building, there are the memories, beliefs, wishes, codes of action and everything from our psyche associated. This illusionary side is real by the fact that it is integral to and not detachable from human action, through which we exist. For example, we are not able to look on something from purely aesthetic point of view. Full objectivity cannot be obtained. What we understand being righteous by our ethics, seems more beautiful to us. Similarly in Renaissance, the systems of pro-

portions deriving from mathematical calculations were taken as beautiful, especially, since the calculations were believed to be interpretations of some divine order.

The virtual realities of computer games present us another example of the illusionary elements affecting our actions. In the virtual world, we still tend to follow the building rules of the physical world. We build as if there would be gravity. It is difficult to detach ourselves from the traditions. If we would genuinely build the games emphasizing the features of the virtual reality the outcomes would be very different.

## BROADENING THE CONCEPT OF ARCHITECTURE INTO A COMPLEX SYSTEM

As I have stated earlier in this thesis, the relation of people and building, the latter both as a verb and a noun, is much deeper than expected. We know by now, that spaces have a role in the process where we construct the understanding of ourselves and our society. When demonstrating the relationship of spaces to people, we found that the heterotopias exist through mirroring a specific situation of a certain culture at a certain time. In addition to this, we consider architecture as evolutionary development which highlights its process-kind relation to time. All these mentioned above are aspects of architecture. These aspects are interwoven and not detachable from each other. This compound presents us the vast systemic concept of architecture.

Caniggia offers an illuminating example on the complexity of the interrelations of this system regarding people and architecture. The ex-

ample shows also the importance of approaching a situation with all these relations in mind. It would be conceptually unheard of and also a waste of material capacity to produce a wall of columns. As seen from a physical or technical point of view, the columns are best utilized to sustain a beam and offer flowing space. It would be similarly unacceptable in a historical sense to destroy cultural heritage since a temple would have to be torn down in order to get the columns for this wall. However, if I am living in 5th century and my basic problem is how to quickly erect town walls enough to endure a barbaric invasion, I would dispose of temples to build the wall of columns to protect my life. (see Caniggia, 2001)

A systemic understanding of architecture is also required when applying open source model to building. In the model, concepts, actions, tools and outcomes are concurrent and interrelated. When studying a system, our interest lies especially in the relations that compound the system.

By the systemic understanding of architecture, our focus can be nowhere else than in the process of production of space. So as important as what is done, are the reasons of how and why. Applying open source to architecture suggests a collaborative process that exists in time, mind, action and space. Architecture is created by people through its use, as a performance. It becomes a conversation that goes on throughout the life of the architectural system. In this process, the action of making buildings, inhabiting and living the built are highlighted.

*Not only a street.* ▷



## KNOWLEDGE EMBODIED IN USAGE AND ACTION

Space is acted or agitated, put in movement and kept in movement by the people who inhabit it. It is this action and situation, the individual's relationship to and interpretation of the space, that produces the space. (Rajanti, 2008)

Practices can be seen as the fundamental unit of social existence. Following sociologist Shove, they originate from tacit and unconscious forms of knowledge and experience. Through these forms, shared ways of understanding and being in the world are established. Both social order and individuality result from practices. (Shove, 2007) The products and practices typically co-evolve, relating to cycles of production, consumption, innovation and here, to the culture of building. Practices materialize not only through results but also through tools and resources that then again respond to practices.

In a development chain, knowledge can be seen simultaneously possessed by a person and embedded in tools as well as in a product. However, the knowledge is above all embodied in action, and in connection to architecture, to the production of space. According to urbanist Jacobs, cultures live through word of mouth. The practices continue to exist as they are taught to successors in rehearsals where we follow an example that is demonstrated. The rule of "use it or lose it" applies to information and knowledge. We can have vast pools of data securely sealed to digital archives but the moment we no longer know what to do with it,

that culture has perished. Jacobs talks of mass forgetfulness as a moment of permanent loss. As the way of life changes, practices are forgotten. (Jacobs, 2005) For example, we still know a great deal about earlier hunting cultures. We admire this lost lifestyle. But once in the wild, we would not survive, as we no longer have the practice of hunting.

The way semi-professional actors operate, consists mostly of hacking and remixing. Experimenting happens by rehearsing. The methods of creative misuse and random collage highlight the innovation that is born through action. The action is often connected to solving a specific problem that has been detected in usage. Open source supports these informal practices that, in turn, embody knowledge through their close connections to action and usage.

Furthermore, open source is a model of organization that stresses iterated action. It promotes thus also the living culture of architecture. It cultivates the knowledge of architecture that is embedded to the act of production of space. Architecture traditionally already holds a strong link to action as the research and teaching of architecture tend to be empiric and practice-emphasized.

## MORE PROFITABLE WITH BROADER PRACTICE

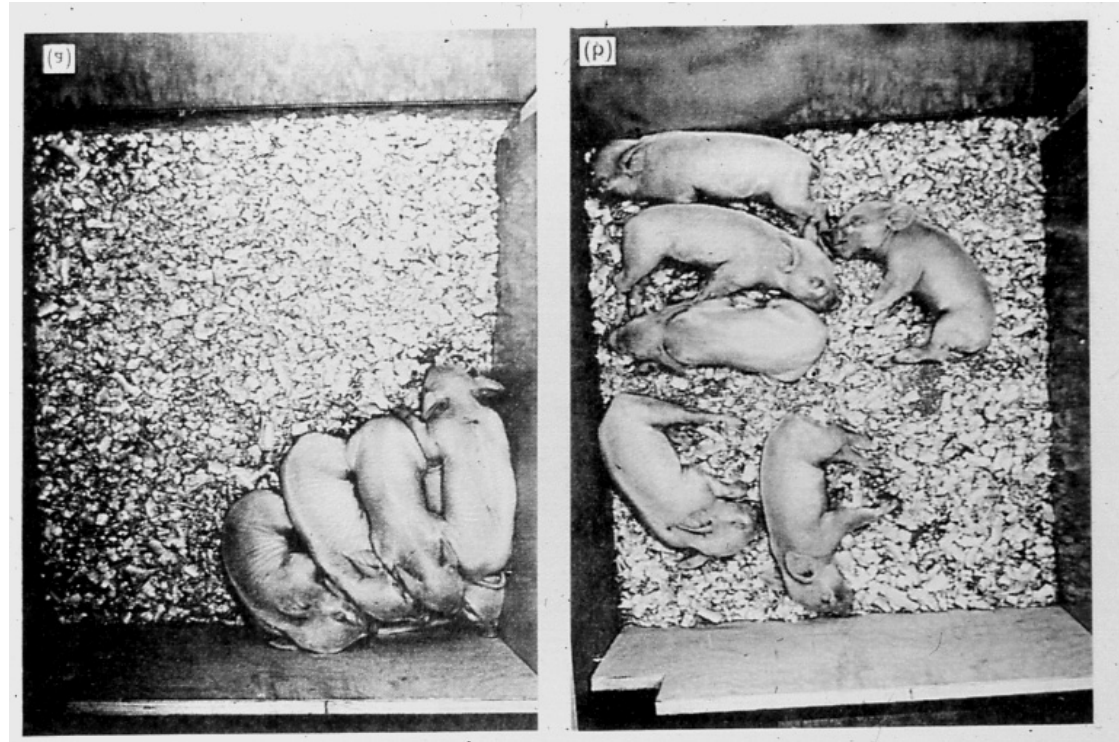
Improving only the built environment does not necessarily increase the well-being of its people. If good infrastructure was all we need, the slum of Marshalltown should have never been born in the first place. All the facilities did

once exist. If it was somehow possible to suddenly upgrade the buildings to a top condition, we might be still left with the absurd situation where the people who could afford moving in, would not, as the neighborhood would still have its bad reputation. The contemporary residents would be forced to move out since they could not afford the new standard of living. Problems would stay, only the location would change.

Thus regarding the city as a whole, a transformation process stressing the inclusivity is the only sustainable solution. It gives people the possibility to achieve a better standard of living, step by step and in connection to their built environment. Also the reputation of the area has time to improve and to become a home for its inhabitants. In addition to this, from the brutally economical point of view, the investments done to wipe away and re-erect are not be profitable.

Another point of view needs to be stressed in connection to basic improvement of built environment. Building infrastructure for people to access global networks should nowadays be seen as integral as any other update of basic facilities. This is not because the access is seen as a basic need but because of its potential in enabling and triggering the development to achieve better standards of living.





## SPACE AS RELATIONS

△ *"It's the same piglets, in the same box, but on the right hand side the temperature has been increased. This small change in how the space is programmed has dramatically changed the way the inhabitants relate to each other and how they relate to their space. This approach to architecture became my challenge: how to translate such strategies into the general architectural discourse and how to bring into reality such possibilities for the construction industry." -Usman Haque-*

*(Haque in Shute, 2009) (image: Mount, 1968)*

The same pigs in the same box are organized totally differently in the space due to change in the immaterial parameters. This demonstrates how much potential we might gain to designing the spaces if we include also the immaterial and illusionary aspects of space. Spatial structure is defined by relations that are perhaps more immaterial and temporal than static and physical. These relations are interesting as they construct the situation that affects on how the space is acted. Continuing the thought further on, about action in general, we noted earlier, that the action has a central role in the systemic concept of architecture.

## CATALYTIC CHAOS

### SUBJECTIVE HETEROTOPIA FOR FRACTAL UNDERSTANDING OF THE CITY

Coming back to heterotopias, if a heterotopia exist by its relations to surrounding real places, is not this relation always interpreted by a person? I claim that heterotopias are not only strongly time-place-society dependent but also greatly subjective individual experiences. For example, after having sailed for two years my heterotopia would be the harbor.

Heterotopias are needed for the progress of our cities. This progress compiles of the development of individuals. The richer and more plural the city evolves, more likely it will become for each individual to find heterotopias of their own. City does not have to strive to be univocal or to reach any consensus at all. Still, we look on a city foremost as a collective space and therefore, the personal city has been ignored. We all know a totally different city, our life-worlds are not the same. The common concept of a city exists but everyone has an individual perception that reigns.

Fractal system refers to irregular and fragmented organization. It is not just simply more complex than the Euclid or Newtonian understanding of geometry proposes but differently complex. Fractal system follows natural structures. To understand the way a cloud exists and functions, it cannot be abstracted as consisting of spheres. Allowing fractality as a human organization pattern does not mean wiping out the collectiveness. In fact, it means

the opposite. Fractal city offers an alternative way to encourage the sense of community. It allows the chosen individual interpretations and personalized uses of different places. This supports P2P communities. Distinction is noticeable compared to traditional efforts to produce sense of community. Misleading ideas of the kind that a space as such would be able to generate communities, have made these efforts fail. Further on, these spaces have been planned for specific needs of an average community, forgetting that such common cultures do not exist any longer.

### DEVELOPMENT IN CHAOTIC CITY

Chaos theory describes the behavior of systems with evolutionary dynamics that are highly sensitive to catalytic conditions. The theory is also referred to as the butterfly effect. As a result of this accumulative sensitivity, the behavior of chaotic systems appears to be random, even if the behavior follows logic evolution. Chaotic systems are the rule, not the exception. Their dominant role has been gradually discovered in science during the past 20 years.

Chaos and emergence, the simple entities forming more complex behaviors as a collective, both deal with development. Nevertheless, they are not only generators of new phenomena. Chaotic systems, city being one, actually provide balance and continuance through being dynamic in their responses to altering circumstances.

Emergence in turn provides problem solving where adaptability derives from local intelligence. This grass-root knowledge accumu-

lates to swarm logic. Emergence and chaos both ask for critical mass interaction and random encounters. The accelerating information revolution will come up with more and with new kinds of collisions and interactions.

<http://idealist.blinkr.net/> (random collisions of ideas)

*Idealist is a platform for sharing random ideas. They are at the states of concepts, sketches of objects that are in a prototype state or just pure dreams. Ideas can be browsed or searched by categories, commented on and used for a source of inspiration. The aim is simply to let irrational thoughts collide. It is interesting as the innovation part is made collective at really early state of the design process.*

<http://www.facebook.com>

(random generator of weak ties)

*Facebook is mentioned once more in order to emphasize its system of promoting interaction with people outside the tight social networks. It creates a place of interaction that is new, thus allowing new patterns of behavior. Facebook suggest you to contact people that share something in common with you: a friend, location or an interest. You form new groups around these interests and further on follow what interest the people involved in the group have. The friends of your friends will be easily visible, enlarging the pool of acquaintances. You also gain another point of view to people you thought you knew. As the critical mass has become large, simple search for the acquaintances of the past recreate the bond.*

### STRENGTH OF WEAK TIES

Individuals have social networks of strong ties with their close friends. This tight network is attached to sets of acquaintances with weak ties. Sociologist Granovetter argues that, in contrast to general belief, the weak ties are far

from creating alienation. They are actually vital for individual's integration into the modern, highly networked society. The weak tie is the crucial bridge between the two densely knit clusters of close friends.

Individuals with few weak ties will not receive information from distant parts of the social system. They will be restricted to the easily homogenized views of their close friends. This deprivation will not only isolate them but may put them in a disadvantaged position. Social systems lacking of weak ties will be fragmented. New ideas will spread slowly and subgroups separated by race, ethnicity, geography, or other, emerge. (Granovetter, 1983) Social media facilitates and gives birth to informality of weak ties at magnitude never seen before.

## REACTIONS TO COMPLEXITY

In western countries, complexity is consciously generated in order to enrich our overplanned and partly necrotic urban tissue. We look for agitating the development. The aim is to regain the chaotic system dynamics and self-regulation capacities. By contrast, in Africa progress has been intended by governing and restricting the complexity.

However, in Africa, the complex informal sector is in practice the prevalent form of action. The informal sector consists of small self-organized and highly networked actors. The informal economy is larger than the formal one. Only one in ten workers in Africa holds a formal job and barely one in ten lives in a formal house. According to economist Soto, the total

value of African's informal urban dwellings in 1997 was approximately two times the continent's entire annual gross domestic product. (Soto, 2000) The small informal units therefore form a massive compound.

We intuitively attach mostly negative interpretations to the category of informal. Still, informal could also be described as a flexible and productive high-density urban response. Without the structures of informality, for example, the city of Johannesburg could not sustain its population. Food is produced on balconies and markets emerge directly at the location of the demand. Scarce and insecure public transport of Johannesburg is not able to compete with the adaptive informal minibuses.

Yet, the advantages of becoming formal are longed for. The security and sustainability are limited in the informal sector. Informal actors do not have property rights or recognition in the eyes of the formal society. Neither do they have access to public services.

The process of formalization is slow and difficult. The change from one organization to another will be gradual and it will not happen overnight. This transformation process asks for operation models such as open source that include the formalities in-between. But what kind of collage of formalities is the eventual target? How to attain the positive features of the complexity and yet, at the same time, strive towards more stable conditions?

Urban slums and their current structures of informality should be seen as something to learn from. It is easy to pay too much attention on something being informal or illegal and for-

get the characteristics that are, nevertheless, beneficial to the development on the whole. The inhuman conditions attached to the informal sector attire all the focus and the other features stay in background. Formalities and laws are human agreements and they can be questioned. The interpretation on them can differ under different circumstances.

## SPACE GENERATING CULTURE GENERATING SPACE?

In the mid-20th century, cities were believed to be logically organized, simply structured and thus predictable. The common conception prevailed that they could be designed in a way that their residents' quality of life could be directly improved by manipulating the physical form of the cities. This concept was based on the belief that the social world and its representation in the physical world can be understandable, and the two worlds could be related to each other in a rational way.

However, cities are chaotic. At the same time it is also true that the space is transformed by the lifestyles led in it and that the life-world of people is affected by the space surrounding them. The relation of the social and physical world is not a simple one. Simplifying this relation misleads us in designing spaces.

Because this complex relation nevertheless exists between the social and physical world, we can suppose that the space that is other to what we are used to, could assist in finding new inventive uses of space and new social peering. Similarly, we can assume that the culture

of the non-normative will create alternative spatial structures. We can expect therefore the new phenomena of social behavior, such as open source, to start becoming visible in our cities. At least we can expect more frequent and more powerful temporary heterotopias.

As a consequence of self-organizing becoming easier, there is the chance of an increase in activism and in the amount of demonstrations. However, activism or gatherings are not necessary phenomena that need to be objected. For example, flash mob is an action organized by social media. It is created by a large group of people who suddenly assemble in a public place. They perform a brief unusual act and then quickly disperse. The act might function as a comment on something or it might take place just for the fun of doing strange things. This brings new life to urban culture.

<http://carrotmob.org/> (activism opposed to boycott)

Carrot Mob is a network of consumers who are committed to buying products or services from businesses that make socially or ecologically the most responsible decisions. It is a method of activism that is opposed to a boycott. Businesses compete with each other to see who can make the best promise and the winner is rewarded with a big mob of customers. Consumer power becomes a tool in making the sustainable business practices also the most profitable ones. It is an efficient method of activism always leading to some improvements. For example, campaigns have been introduced in the past where a certain percentage of profit from a set period of time has been used to improve the energy efficiency of a business facility.

<http://twitter.com> (instant information flow)

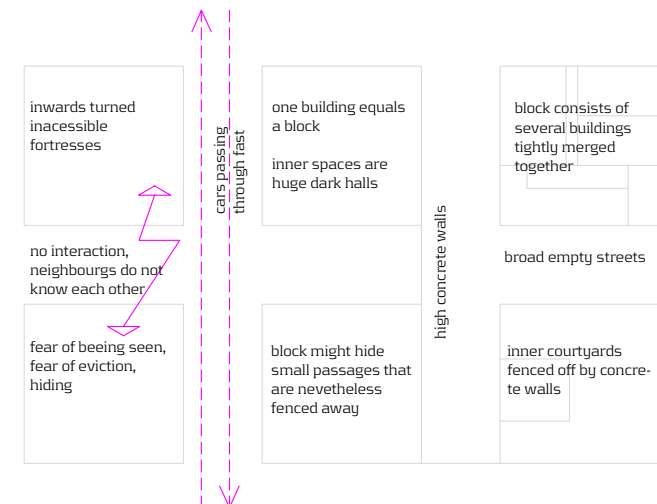
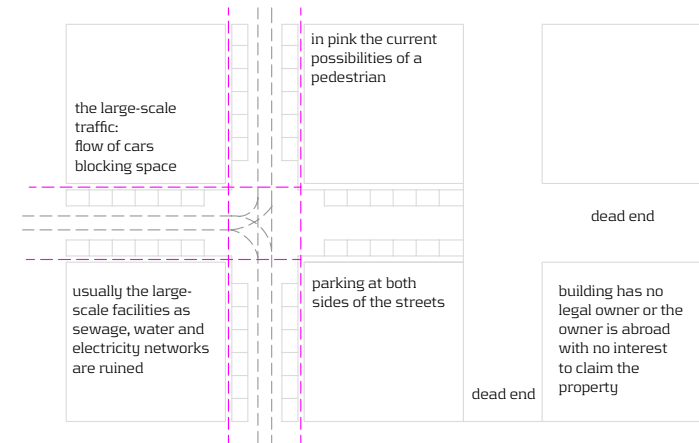
Twitter is a free social networking and micro-blogging service for staying connected in real time. It enables its users to send and read each other's updates known as tweets. Tweets are short text-based posts which are displayed on the user's profile page and delivered to other users, known as followers, who have subscribed to them. Senders can restrict the delivery of the information only to those in their circle of friends or allow anybody to access them. Users can send and receive tweets via, for example, the Twitter website or telephones' SMS-service. Actors varying from individuals to media and institutions are following and being followed. This supports both formal and informal interaction.

Twitter has proved to be effective in getting data in and out during unexpected situations. In emergencies like fires it is a tool for sharing immediate instructions on how to act. In disasters, Twitter has enabled quick information collection to estimate the need of hospital resources. During situations of conflict, eyewitnesses have sent in data to reveal their points of view. Twitter has also been used to quickly gather up amounts of people for protests or demonstrations. The current president of the U.S., Barack Obama, used Twitter as a tool for gaining publicity during his campaign for presidency.

## ON TRANSPARENCY

Integrated virtuality and the new practices in the virtual are making our society more transparent. The amount of people engaged in semi-professional micromedia is increasing. Many of us have the chance to, for example, take pictures and report the information to be broadcasted globally. It is not so much anymore about "the big brother" observing us, as it is about us keeping an eye on the authorities, rulers and each other. The actions in public space will be public globally if they have informational value. The mistakes and abuses are noticed, thus creating pressure also on better building.

▽▷ The legacy of the era of apartheid is still visible in the built environment of Johannesburg. The need for de-blocking space and re-introducing the small-scale actors, as well as small-scale actions, presented with diagrams and through the neighbourhood in Marshalltown that was zoomed in on earlier as well.



high concrete walls

cars passing through fast

parking at both sides of the street

closed fortresses

broad empty streets

dead end

industrial buildings with deep masses

dead end

closed inner yards

closed passages

high concrete walls

closed passages

dead end

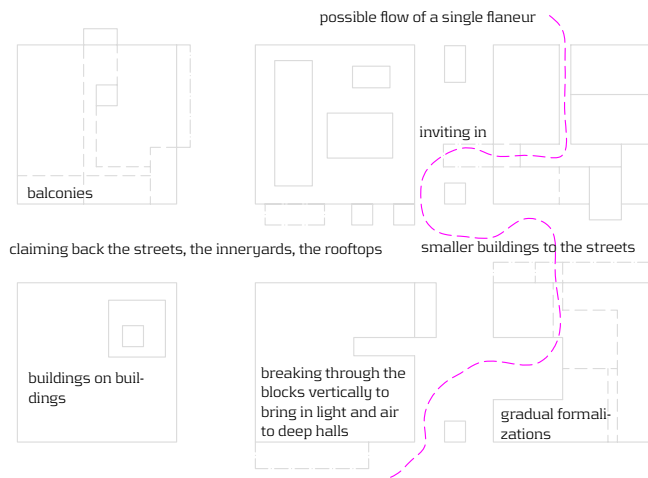


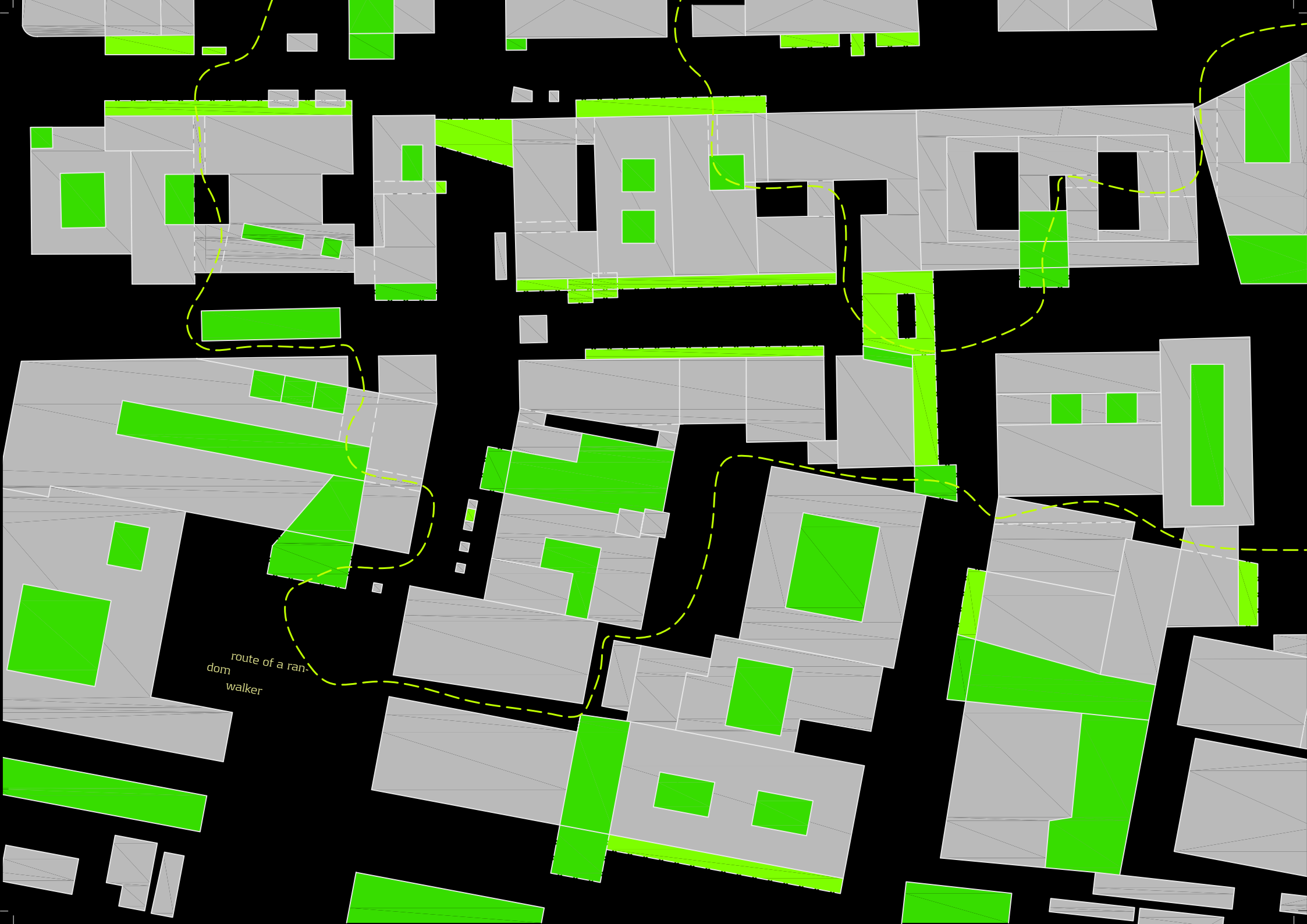
1:1000



In addition to our physical world, also the actions in the virtual are becoming more transparent. Private digi-detectives have emerged to survey the virtual world. Internet societies demonstrate their capacities to self-regulation. For example, two youngsters downloaded video material on YouTube on how they abused a cat. In order to prove that such cruel actions are not supported nor tolerated in the YouTube community, the other users self-organized a global tracking of information to reveal the maltreaters. The data that was gathered from other social networking websites led to identification of the abusers and later on to legal procedures. [see Moore, 2009]

▷ *Physical space chopped and scaled down, to be differently organized. It can be intentionally done but the diversification will most probably happen also by the emerging open source practices of production of space.*





*route of a random walker*





**THEME 3**  
**ALTERNATIVE ECONOMIES**

## ECONOMIES AS INTERACTION

### INFORMATION AND MEANING ECONOMIES

Contemporary way of life is based on specialization that the distribution of production enables. Therefore, our life is also based on consuming. However, consumerism provides still a rather limited range of choices for individuation. The need to individuate further and express oneself also through the choices of what we use and buy exists. Following the rise of culture economies that concentrate on experiences, the concept of meaning economies or information economies is now establishing itself.

In information economies, the emphasis on information does not only mean data managed through computers. Neither does it refer solely to immaterial products. Information economies include the increase in symbolic values of a meaning of a product. By buying fair trade or organic fruit not only do we satisfy our hunger but also promote a certain way of thinking.

When a company produces a product with a strong symbolic element, the company is regarded as an information producer. Demand for these meaning economies exists also in the field of building. Self-actualization through open source architecture could be the next “big thing”, whether it happens through participating P2P search for solutions or compounding a personalized home.

### INCLUSIVE BUSINESS MODELS

One way to relate to the globalization is to actively work with the new emerging markets. Inclusive business models have been introduced and are strongly recommended by United Nations. They create an alternative method for supporting developing countries. Inclusive business models suggest trade market economies that are more open and stressed with social, cultural, ecological and other distinctively human values.

Inclusive business models target to include the poor in every stage of the activity. They are seen as clients, employees, producers and business owners. Inclusive business aims to build bridges to benefit all parties. These benefits go beyond immediate profits and increased incomes. For the poor, they mean most importantly meeting the basic needs of food, clean water, sanitation, electricity and health care. This type of business also brings on self-empowerment through sustainable earnings. Access to education and information is facilitated through skill transfer. For businesses, the benefits contain a possibility for future leap in prototyping strategies. At the same time, inclusive business models are a type of meaning economies.

### WHY ENCOURAGE DEVELOPMENT BY THE MEANS OF ECONOMIES?

City planner and sociologist Jacobs states that the city that does not develop new economies, new human culture, will perish. An organ that does not renew will die because the circumstances around it continue evolving. A

living culture is in a process of constant mutation. By transforming, a culture does not lose itself as a framework and context of change. The new economies are essential to the human continuum. (Jacobs, 1961)

Trade can be seen primarily as a form of interaction, not necessarily even including actual transfer of money. Markets can be regarded as something immaterial, as a trade of know-how. In development co-operation, investing in something that stimulates new activity as trade is noticeably more productive than simple donations. Productivity should be measured in this context also by the increase in well-being in relation to self-actualization. According to philosopher Goldman, a human needs a reason in order to act. Action due to a reason gives us the feeling of meaningfulness. Action fosters well-being, especially, if this action is self-appreciated. (Goldman, 1970)

Interaction as such is already one goal achieved. Being capable of working together with someone, with whom you disagree on some issues but yet share a common goal, is an advantage. Interaction might eventually lead to solving the original conflict.

In 2004, trying to make the most of the existing possibilities to operate, World Health Organization (WHO) workers in Somalia adapted a rather abnormal strategy. Firstly, as the only authorities existing during the civil war were the warlords, the workers learned to negotiate with them. Secondly, the WHO workers followed the operation model of the local women who had set up food selling shacks by the road blocks of the warlords. The women did not serve only the

soldiers, but also the people going through the inspections of the soldiers. WHO took the opportunity to vaccinate all the children that were waiting in lines at the military road blocks. Otherwise, they would not have been able to reach the Somalian children. (Guest, 2005)

Dealing with co-operators that are less ideal, is a way of including the informal actors of urban development as well. This gives us a more realistic view of the field of action.

## **DEVELOPING NEW MARKETS**

In developing countries, the private sector and the poor possess potential for entrepreneurial activity that is largely untapped. The 4 billion people at the bottom of the income pyramid, defined as people living on less than 8 US dollars (5,5 euros) a day, have a combined income of about 5 trillion US dollars yearly. It is similar to the gross national income of Japan. (see UNPD, 2008 & 2007)

The poor are willing and able to pay for goods and services prized to fit their markets. Still, people often suffer from a poverty penalty. They pay sometimes more than rich consumers for essential things. People in the slums of Nairobi pay 5 to 10 times more for water than people in high-income areas of that city. Water in slums is more expensive than in London or New York. The poverty penalty is similar, for example, in credit from the informal providers, in electricity or in health care. Business models that offer better value for money or entirely new products and services, have a realistic possibility of meeting the expenses derived

from being the pioneers.

Actually, the profits of inclusive business models easily surpass the possibilities that exist in the markets of developed countries. Especially as the western markets are at the moment paralyzed. Market logics of small profit per one transfer combined to quantity of these transfers applies. Smart Communications, a company providing prepaid phone services mainly to low-income consumers in the Philippines, has become the most profitable of the country's 5 000 largest corporations. Sulabh, a low-cost sanitation facilities provider in India, had an economic surplus of five million US dollars (3.5 million euros) in 2005. Motorola estimates that more than 80% of the world's population lives in an area of wireless networks but fewer than 15% of Africans currently have mobile phones. In addition, to demonstrate the existing demand, nearly half of the world's population does not yet have access to clean water or to adequate sanitation. (see UNPD, 2008 & 2007)

## **FROM DEVELOPING TO RISING COUNTRIES**

The concept of developing and developed states that has been generally used before, has turned into threesome of developing, rising and developed countries. Here, with rising countries we refer mostly to the booming economies in Asia and there to the countries like China and India. South Africa has the potential of being among the next rising countries.

In connection to the case study, South Afri-

ca is at the moment leading the business in African continent and Johannesburg is the center of this activity. If South Africa prospers, it could pull the rest of the continent in its wake, as Japan did in Asia. Japan's economy grew in the 20th century especially by adopting and improving on the innovations started elsewhere. Open source model builds on shared innovations, especially if the strategy of future leap is stressed.

You can already see features of a leap to future in Johannesburg. In 1998, only two million people had cell phones on the African continent. Four years later the figure had jumped up to 30 million. Today there are approximately 43 million mobile phones only in South Africa. It is safe to say that almost everyone in Johannesburg has a mobile phone or access to one. Mobile phones are experienced as a mean of accessibility that is more important than owning a vehicle, for example. Basic telephone lines, on the contrary, are scarce and it seems that there is no actual need to build them anymore. (The Economist, 2002) (Fildes, 2008)

## **CRISES AS GENERATORS OF INNOVATION**

A crisis arises when any structure, whatsoever, is incapable of adapting to new needs. What gives crises positive connotations, is their attempt to create something new and strike a new balance to a changed reality. The challenge of developing inclusive business models most possibly leads to innovations. For example, to meet the poor's preferences

and needs, we have to offer new combinations of price and performance. New constraints, varying from the challenges of transportation to the inability to enforce contracts, require creative responses. These demands drive the development.

On the positive side, developing countries lack some of the obstacles of western societies. The attitudes towards innovation may be more open. There are no previous industries opposing and restricting new innovations in the fear of losing their markets. Practices are not yet rooted. Developing countries also lack of the old production chains with facilities, machinery or technology that should be used until the end of their lifespan before implementing anything new.

Innovation has an interesting relation to resources and limits. One could imagine that without limits and holding excessive resources, the creativity would flourish. However, in Dubai for example, where the money, material or professional capacity do not set limits on architectural projects, the building culture tends to follow historical clichés or be full of other mimicking actions. The building in Dubai also concentrates on scale and magnitude, rather than other qualitative explorations.

The virtual built environments, such as game worlds, become once again interesting in this context. They hold even less restrictions or normative context in comparison to Dubai. In the virtual world, there is no gravity, no climate, no distances, nothing material and the expenses of building can be minimal. Still, the game worlds tend to be the ones especially interested in historical solutions, building up medieval scenes,

for example. The freedom to do anything imaginable is used that way around. Ultimately, necessity is the mother of all innovation.

## **IT HAS HAPPENED BEFORE**

During the regression in the 1990s, which in Finland according to estimations was even deeper than the Great Depression of the 1930s in the US, a company called Nokia had to radically change its way of functioning in order to survive. The following rise was based on a model to create innovations by interactive processes. The model was complemented by a networked and distributed structure of the company. This tissue-kind organization consists of small actors from multiple fields, from research specialists to customers and subcontractors.

Tissue of actors reacts quickly to changes. Networks enable re-clustering for each task at hand. However, it stays safe for an actor in a network to specialize on something. There is no fear of specializing too far and not having enough demand as a result. Networks support innovative individuals and taking risks. They also allow flexible models of working, entrepreneurship and timing of work. (see Castells & Himanen 2004)

In the 1990s, Nokia put all its effort on the newest communication technology of the moment; the mobile internet. As being released, it soon became obvious that this was the answer to a huge demand. Nokia's success was also based on social innovation. The mobile phones were created to fit the lifestyles of everyone, not just targeted at the businessmen. In logistics, Nokia counts on just-in-time

providing which enables the company to react on changes in demand at the very moment they are detected. Staying up-to-date requires continuous studies and feedback loops. This strategy has similarities in comparison to the method of planning the urban processes that is presented earlier in this thesis. In that context, the datascape is the tool to stay updated and to react to changing needs.

Nokia's aim is to share information transparently, though this mainly still happens inside the company. The growth of Nokia was assisted by the situation where the global financing structures were becoming more open and the practices of the state more flexible. What we have today, is a world-leading high-technology provider which was a prominent factor in pulling Finland out of the regression.

It might be symptomatic of the current time, but just recently Nokia took the next step and threw some of its innovation processes to open source in order to be able to push the development further. (Clarke, 2008)

## **CATALYST TO BUSINESS**

Open source process innovation method could create a boom similar to the one of Nokia in the 1990s, both for developing and developed co-operators. We can achieve such results by combining it with the emergent new technologies, such as location aware networks and personal devices that are mobile and intelligent. The social innovations of new media, the inclusive business models and the meaning economies bear plenty of possibilities. In addition, we

can take advantage of the globalization with the leap to future realization model in mind.

As we are interested in accelerating positive development and in generating income, the potential of the quickly developing world of virtual reality cannot be ignored. As being immaterial, its structures are easily put together. Virtual reality is a phenomenon on the verge of emerging and therefore its power in forming a completely new industry with new innovation clusters is fascinating.

Especially in Scandinavia, states traditionally use the building industry as a mean for boosting the economy of a country. Jobs are efficiently generated by supporting building. The chains of reaction from big corporations to sub-entrepreneurs are vast. The subsidies materialize in infrastructure or buildings. The possibilities of a state to catalyze business through building industry are good, as the state often already is the actor realizing, guiding and enabling the implementations of building. The state is thus becoming only more active in one of its original tasks.

### **NOT ANOTHER SILICON VALLEY**

However, it is worth emphasizing that the market approaches alone are not sufficient. Open information society most probably creates the economical foundation for well-being but the information society does not spread the well-being on its own. The famous Silicon Valley in the U.S. is determined by the market driven and dynamic open society. The openness fosters innovation and business but there is a deep division in the well-being and incomes

of the country's residents. The amount of poor remains remarkable. This polarization is driven by the combination of the culture of risk taking and the solitude of entrepreneurships that lack of safety networks. Therefore, the reactivity brought by information society, is visible in the U.S. through unbelievable success stories but also through the fast falls of individuals.

### **OPENING UP GAINING GROUND**

Open source models have shaken the fundamentals of the software world during the past decade. The examples are numerous. In 2009, open source GNU/Linux is supposed to gain a market share of 10% of operating systems, this being triple to Mac OS. GNU/Linux is continuing the rapid growth especially in the rising countries. (Noyes, 2009)

In 2006, the freely available database MySQL had gained 25% share of overall installations in only two years. (Evans Data Corp., 2007) MySQL, first merged to Sun, was recently bought by Oracle, who is reacting to the changing industry of computing by concentrating on the integrated hardware-software systems, where especially the software follows open source. (Asay, 2009)

The way the traditional actors are relating to open source is interesting. They search for functioning collaboration with established P2P communities. We can say that the web-based open source encyclopedia Wikipedia has overtaken Britannica. Britannica still prints the traditional multivolume encyclopedia and other reference works but about 75 % of its revenue

already comes from online sales. Wikipedia, with 10 million articles and 275 million readers per month, is on a different scale in comparison to Britannica's online edition which serves just 200,000 households and offers approximately 112 000 articles. The new version of Britannica Online approaches the Wikipedia's concept by letting subscribers make changes to the articles, the changes ranging from minor edits to total rewrites. However, it still stays different to Wikipedia. Britannica is a chargeable resource supervised by professional editors. It stresses the credibility of articles as it demands the authors to be identified by name. (see Bray, 2009)

News agencies have taken civil reporters as part of their content production. News channel CBS has followed the same trend but the other way around. It offers formal content via informal channels of YouTube. The experience may encourage also other TV networks to embrace informal broadcasting sites instead of underestimating their importance. In the beginning of the cooperation of CBS and YouTube, the 300 clips CBS uploaded to YouTube attracted during one month 29.2 million viewers. In addition, there was a five-percent surplus of viewers to the broadcasts on television that had a connection to the clips that had been uploaded to internet. Most excitingly, CBS learned more about their audience than ever before through YouTube's feedback systems. (YouTube, 2006)

Also museums are testing the new tools. El Prado Museum in Spain has teamed up with Google Earth for a project that allows people to



zoom in on the gallery's main works from their home computers. You can get to the level of details not immediately visible even to the human eye. Naturally, there is nothing comparable to standing before any of these paintings in the real world. However, this experiment offers a complementary and different view on art, that is more easily accessible via internet, with the additional twists of located data. (Giles, 2009)

## INCOME GENERATING

### MICROREDITS

The poor cannot often meet even the most minimal qualifications to gain access to traditional credit from a bank. They usually lack of verifiable steady income and property rights. Microcredits are a financial innovation enabling people to engage in self-employment projects that allow them to generate an income. In one of the most functional models, microfinance builds bridges between self-organized groups and traditional banking. Groups often consist of twenty or fewer members, of whom the majority is usually women. Members save small amounts of money to a shared account. They may borrow from the group fund for small expenditures. As the group proves being capable of managing their funds well, the microfinance operator facilitates them to borrow from a local bank to invest in small businesses.

In India, nearly 1.4 million groups comprising of approximately 20 million women, now borrow from banks which makes the Indian SHG-Bank Linkage model the largest micro-

finance program in the world. (see Kumar, 2009) Access to microcredits can be facilitated via the process of building.

### INCOME GENERATING VIA THE PROCESS FOR NEW ACTORS INCLUDED

Upgradings of slums are challenging tasks in quantity and quality but they simultaneously offer possibilities for work and income generation. For example, due to its magnetism as an economical capital of Africa, Johannesburg attracts large amounts of immigrants every day. People also migrate inside the city. There is a need for the flexibility that rental rooms and apartments offer. In Johannesburg, there is immediate demand for rental accommodation also because of the 2010 FIFA World Championship. Tourists will pour in but hotels are still scarce. One could ask for some extra for renting out a room during the championships and get a good economical kick-off. Rental rooms are needed also as an alternative response to the general lack of housing. They could offer a cheap access to shelter.

A household committed to an upgrading project of a slum can be facilitated to build a combination of an apartment and a rental room. Rental room would then be a steady income generator for this household thus giving access to microcredit. This is open source architecture becoming visible in new practices, in this context in the form of planning enabling processes.

Production of electricity can be distributed to household-sized units. Firstly, it provides electricity there where the access to the grid

does not exist. Electricity becomes free of costs after covering the expenses of the establishment. Secondly, it generates income as the leftover electricity can be sold to neighbors.

Generating skills can also be a part of a building project. Verifiable knowhow, such as gaining a profession, creates basis for steady income. A building project can be facilitated especially if there is simultaneously skill transfer included. The knowledge obtained in the building project can be passed on to the next person. With a commitment to continue the transfer further among the locals, a promise of similar assistance for following projects in the slum can be made. This creates a snowball effect. Through digital open source facilities skill swap is easier to organize.

◁ *New activity as a performance in the streets. Marshalltown is known for its vehicle repair industry. Some of this activity has stayed alive in small work shops. The repair business includes at the moment also a special training facility. In Marshalltown, the mechanics have a particular habit of keeping their workshops' large doors open to the streets and working partly outside. This apparently strong element of identity brought by the industry can be supported further by, for example, integrating the solar car prototyping to practice.*

## ALTERNATIVE MODELS OF COLLECTIVE FINANCING

Granting system is known to enable experimental or minority actions that might not be immediately profitable or seem too risky for traditional funders. However, the decision on what is to be granted lies in the hands of a relatively small group. The few decision makers are acknowledged by a certain culture and certain values, that these same grant providers themselves will likely continue supporting. Therefore, the cycle does not necessarily promote new innovation.

Independent grant communities instead are self-organized entities formed around a specific subculture. They manage their gathering and sharing of resources collectively. The unit has though autonomy to act in the context of its subculture. Collective accounts help communities to deal with their money, by creating pools of resources where tracking and managing the funds among the members is possible. P2P and open source production networks are known to create collective financing systems of their own as traditional banking might find their activities too informal.

Collective financing becomes an interesting tool in targeting resources straight to groups of people acting in the very context of building, at the grass-root level.

<http://www.tandatanda.org/> (independent granting)

*Tanda Foundation is an informal nonprofit organization run by its users. It targets to find new ways to support creative production. It aims to create a community interested in P2P funding via microdonations and to decide on their own cultural agenda. The Foundation strives to be an accountable platform of funding for its users, through the process of application, reviewing, voting, and collection of funds. Tanda is a free model and anyone is allowed to copy it to create a funding network of their own.*

<http://www.scred.com> (shared accounts)

*Scred offers free tools and services for collective banking accounts. Pools can be used to easily share the resources of the pool members by lending money and keeping track on the debts. Scred calculates automatically the debts and shared expenses within the pool. After a long trip together with your friends, imagine being able to just write down what each has financed and the transactions are be automated. MiniCorps, instead, allows groups to track income and expenses as a whole, to have the automated accounting, as well as actually sell items and receive money. This system is ideal to small associations, bands, hobbyists and event organizers.*

## SOURCES OF INCOME RE-STRUCTURED

Although, for example, open source software is usually free of charge, it has become a multi-billion-dollar industry. Income derives from distribution and after-sale services. Information collected in processes of using and generating the open source product is sold on. We buy hardware to access open source facilities or accessories, such as instructive books. The open source is practiced to gain product development, market dominance and publicity. Individuals use open source to gain visibility that might lead to

projects, contracts or assignments, for example. In addition to the interest of promoting livelihood, a number of hobbyists use open source to discuss their ideas and to find the innovations of others. Open source is a facilitator and generator of new income strategies.

However, in order to succeed, open source needs alternative economics. Things do not run on their own. Open source requires new ways of generating income or other benefits. For example, Spotify is a music distribution platform in the internet that first was accessible without charges. Nevertheless, it had to start recently collecting monthly fees from its users. The act is contradictory to its initial aims. Charging became necessary mostly because the original scheme of financing the activity was too optimistic.

Open source shakes up the economic and social principles of intellectual property. This fact probably is the biggest obstacle for its adoption at large. The needs and interests in the context of African development, for example, can though be a catalyst of change. Architects are desperately needed in places where they can least be afforded via traditional business models.

## STRICT CONTROL PLUGGING DEVELOPMENT

Drug patents are a sad example of licensing gone wrong. The organization model itself inhibits the emergence of an more open practice that most probably would lead to new development of the industry. The development of drugs is claimed to function only if the develop-



ers have the right to keep the innovation process and the results closed. In order to cover the costs of this closed study, it is believed that the drug and its price has to be monopolized. This kind of business model turns the focus of studies towards the illnesses of the rich where the profit is easier and quicker to gain. The act leaves the majority of new development opportunities in the field of pharmacology unexplored. In addition, from a human point of view, the price of patented drugs is the main reason why these drugs are not accessible to developing countries. We can also question the right to keep this kind of information closed.

The model for global agricultural production also carries twisted features. While a large number of Africans live with one US dollar a day, the average European cow gets approximately two dollars a day in farm subsidies, not to mention a Japanese cow who receives seven dollars. (Guest, 2007) Subsidies make farmers in developed countries produce more food than their consumers need. The overproduction is sold to developing world with underpricing that the local market cannot compete with. This discourages the local agriculture and increases the dependency on imported food.

## **COPYLEFT**

Copyright is a tool to assure the rights to intellectual property, such as innovation and art. It also looks after the right to income deriving from them. Copyright traditionally stresses the owner's control over the forms and versions

of the intellectual product. However, the paradigm of copyright has changed, especially because of the emergence of new digital culture. Challenging the concept of copyright does not mean disrespecting the intellectual property. Still, the way the copyright licensing functions needs to be diversified. Re-interpreting copyright is a reaction to emerging open source operation model. It targets to meet the needs of collective versioning and evolutionary design.

Copyleft is a form of licensing that uses the copyright law to remove restrictions of building on the work of others. It also aims for more functional distribution of the results born in this accumulation of information. The copyleft licences of, for example, Creative Commons enable art and information producers to give out rights for the users and follow-up developers according to the conditions the producers themselves define.

Where copyright (C) keeps all the rights to the author and Public Domain (PD) gives all the rights away, Creative Commons (CC) acts in between. Innovation producers can, for example, flexibly define how their product can be copied. They specify whether it can be used for profit or only for non-commercial aims. The work can be accessible mainly for viewing or the producer can give the rights to continue with its development. All rights reserved turns to some rights reserved. General Practice License (GNU) is a similar alternative to CC, used mostly in software development.

Keeping some of the rights reserved serves the concept of openness. It makes sure that an open product cannot be closed. A license that

demands for keeping the code open when the work is distributed and developed further assures that the original developers will get the feedback. The work of follow-up breeders becomes beneficial to everyone included in the development chain. This demonstrates the benefits of keeping the innovation process open.

## **YOU BECOME WHAT YOU SHARE AND WITH WHOM YOU ACT**

The evaluation of scientific information traditionally happens inside that particular scientific community. The information there is not property of an individual but can be openly developed, critiqued and altered. Open source communities function the similar way. Author Leadbeater suggests that in the networked world, what we hold in common is as important as what we own as private people. Furthermore, what we share is at least as significant as what we keep to ourselves. (Leadbeater, 2008)

The networked organization builds collective intellectual value. The operation model is based on the openness to such a degree that it can reach the copyright's aims of right to intellectual property through its own means. Inside the network, publishing an innovation as largely and openly as possible is the best way of assuring that the rights to it will be attached to its developers. The value of the work will be demonstrated in feedback from the network. If the innovation is remarkable, the network will adopt it. The better the input is, the more it will be developed and built on.

This way of evaluation applies especially to subcultures and peer-societies, who can clearly acknowledge the value of original innovation. The gained respect changes the framework of the original actor who presented the innovation. This affects also the original input which becomes more valuable. From the aspect of the initial developer, this acknowledgement often also leads to opportunities to generate income. Network capital is the value built through acting in a network. It includes also the facilities and resources that are available through this network.

### **NONCOPYABLE ACTS AS INCOME OF DESIGNERS?**

There are things that are not copyable. They exist only in a specific context of time, place and situation that will not be the same if recorded or repeated. Live concerts, going to a specific restaurant or human face-to-face contact in business are all features that are highly appreciated in general. They cannot be replaced by any virtual reality. For example, as music has become rather freely downloadable from internet via a formal or an informal medium, the music business itself concentrates more on getting its income from live shows. The noncopyable acts will be central in the income models of open source culture.

In architecture, we maybe concentrate too much on the right to plans and drawings. We could be more interested in the act of realizing and applying that plan, having rights to the live show. Focusing on specific implementations could be one of the income models to future ar-

chitects. Another model consists of the designing of processes mentioned earlier. Designing structures for the noncopyable acts is frequent in open source culture.

### **VISIBILITY TO TRIGGER POSSIBILITIES**

Open share of a product creates more users for it and thus also more demand for co-products and co-services. The act of free distribution itself can become a tool for gaining visibility. For example, the *Star Wreck: In the Pirkinning* is a movie that is freely downloadable in internet. It has become globally the most watched Finnish movie ever. Most probably due to the successful distribution of the movie, the authors have gained access to remarkable resources for their next production. This kind of a sudden leap from hobbyists to professionals was not imaginable before.

Cooks make their income through cooking in restaurants, publishing their recipes, giving cooking lessons, writing books on food and performing on television. This promotes the general culture of cooking and generates more income possibilities for the cooks themselves. Opening up could diversify also the income possibilities of architects, leading perhaps to broader building culture.

Open distribution can be used to develop the distributor's own skills. There are bands who share their notes in addition to their recordings. They wish to get feedback-recordings to hear the new versions of their tracks done by someone else. They hope to get inspired by

these different interpretations and thus develop their talents further themselves.

### **PIRACY AND OPEN SOURCE**

Piracy is a movement born in network societies. In Scandinavia, it is embodied in the Swedish party Piratpartiet and the internet facility of Pirate Bay. Through Pirate Bay its users can freely download music, games and movies that are initially protected by copyrights. However, it is difficult to state whether their action is legal or illegal. The webpage functions by listing links in internet, through which you can download the files from other users' computers. It does not offer the copyright protected products. The Pirate Bay activists speak on behalf of the right for everyone to utilize nonprofit access to art and entertainment which is now made possible by new technologies.

The openness that piracy promotes is different to the one open source model proposes. Open source is an evolutionary practice for collective work aiming for development. Piracy is more about using only work done by others. The use happens against the will of the copyright owner. There is no money, feedback or any other type of value building involved. On one hand, piracy does not respect the rights to intellectual property. On the other hand, by the lack of respect it questions the need for such structures. The issues piracy has brought for discussion are important even if we do not support their way of acting.

<http://thepiratebay.org/>

*(challenging copyright)*

<http://www.bookabooka.fi/> (linking offers and demand)

*Bookabooka lists and offers the contacts of people who need certain books or want to sell or rent out books. The action happens on used artifacts among private people, mostly students. The platform itself is not involved in the contracts of how the books are shared and it does not deal with the matters of compensations. However, the copyright associations criticize the activity which illuminates the sensitiveness of the issue of copyright.*

<http://openarchitecturenetwork.org>

(hybrid facilitator of development co-operation)

*Open Architecture Network (OSA) is a professional P2P hybrid networking facility in connection to development co-operation. It is a database of realized and existing projects and their real time follow-up system, targeting to share and work on ideas and inspiration. It enhances social enrichment by forums on categorized subjects. OSA offers a platform and tools to manage projects and to find associates by location, realized projects, activity, interests or special skills. In addition, the aim is to link not only the needs and realizers but also the resources available.*

<http://www.avoinkoetalo.info>

(accumulating information and actors)

*avoinKoetalo is a grass-root initiative to contribute to situation where the need for more energy efficient building is obvious. Nevertheless, the information on how to apply energy efficient solutions in practice to Finnish conditions is scattered. The interest in this experiment is especially in open accumulation of knowledge that is gained by practice. It aims to gather the experimental builders of today, in addition to researchers and product developers. The actual building project itself is developed and discussed through its evolution until the follow-up by themed blogging. Bloggs are spurred by invited specialists. Through this avoinKoetalo is looking for a large interaction surface that is easy to access and still aiming for information pools of specific fields.*

## ICEBREAKERS

Designers need icebreakers to clear away the doubt on the professional networks' value building capacity. How does an innovation system that has traditionally based on competition adapt to open source model? Will we obtain the benefits of opening up without losing our income? Alternative action models need to be tested in practice.



FREDERICK ST

Carlton Hotel

## FINAL CONFUSION

### CRITICAL FEARS

The most important and critical uncertainty is whether the location-based media will develop as an open system or not. Will we be free to attach a review, a video, a work of art or a database with specific locations to our city? Or will the information associated with places be a closed system? Will only those who buy certain software or only those representing certain corporations have the right to write data to the readers almost everyone uses? This would make us passive consumers of pre-packaged substance fabricated by few.

I hope the cities of 2020 will be inhabited by billions of content producers. With located open source information systems we would be weaving improvised communication networks according to us.

◁ *The city with locative open source media becomes an interface for communication. The parking bunker that was transformed into a metro station transmits up-to-date information on the availability of small spaces it offers to be rent for adaptive uses. With the price of a coffee, Chen books an office for 15 minutes to instantly try out the idea that popped to his head. Group of artists are rehearsing their skills of making 3D virtual graffiti. They will be assisting in visualizing the forthcoming project of building a new school center to the other side of the street. The daily news from a wikipedia-kind source of global reporters are broadcast on the facade of the tower.*

The creators and managers of heterotopias of illusion dominate the city. The mechanization of vision has the power of introducing new identities and new lifestyles. It does matter what kind of information we are fed with. Then again, we are afraid of unconsciously sending out too much information to an unknown place to be abused whether the information is private or collective. With open share we need a promise that valuable use will be made of the data. We should be worried about some of the developments in ubiquitous computing where making technology invisible equates to placing the design and construction solely in the hands of a small group.

The apparent openness of open source facilities needs to be continuously questioned. Essential part of an open source organization is the community who operates in it. Therefore, a specific open source process reflects the lifespan of its key contributors. By studying the cycles of open source projects and communities, philosopher Vadén has discovered that they tend to grow old and formalize. (Vadén, 2009)

For example, the rebellious Pirate Bay was recently sold to an listed company. It was a reaction to the claims that the legal proceedings presented to Pirate Bay. This made it necessary for the company to adopt features of traditional businesses and we can say that there is not much more left than the name from the Pirate Bay's original way of functioning. (BBC, 2009) Wikipedia, in turn, was intensively moderated for seven months in order to hide the kidnapping of a reporter of The New York Times. The censorship was justified by arguing

that had the information made headlines the life of this reporter would have been in danger. It is surprising to discover deliberate distortion of information from a source one has considered the mother of open media. (Boyd, 2009) Internet itself is not as open as we suppose. The governments block internet sites on issues they find delicate or dangerous to them. (Collins, 2002) Sometimes we are not fully aware of the agreements we make in the virtual. For example, Facebook owns the rights to all contents produced and uploaded on it. (Facebook, 2009)

However, the contents that are openly published have to eventually take care of their liability matters. The errors of an open publication are likely to get noticed more often and more easily than the ones of protected and sealed information of small circles. We continue having the strange conception that what is printed is automatically more liable than what is found in the virtual.

Many critics have tried to downplay Wikipedia's role as a source of valid information. In contrast, the encyclopedia Britannica is often pointed out as an example of an accurate reference. A study done by the journal Nature does not support this view. Articles from both Wikipedia and Britannica were sent to field experts for a peer review. The experts then compared the competing articles side by side, without knowing which article came from which source. At the end, in the 42 articles comprising of a wide range of themes, just eight serious errors were found, four from each source. (see Terdiman, 2005) The features material and virtual do not directly relate to issues of liability.

How vulnerable will our society become with its dependence on virtual networks, virtual content production and immaterial information management? Butterfly effects turning to a catastrophe? Are we expecting to face virtual conflicts, vandalism, epidemic computer viruses and a growing gap between those who can access the World Wide Web and those who cannot? The individuation and discovery of peer-societies can embody also in extreme forms, such as a cult of school suicide attacks committed by teenagers.

However, we cannot go back to simpler structures of interconnections. Therefore, the distributed open network outdoes the traditional network model. The open network is more dynamic in its responses and though more self-corrective than the traditional network models. The transparency of open source is pre-emptive. In a chaotic network, no one controls everything so no one is able to shut down the entire system. The new organizational model of open source does not propose anarchy or complete freedom. It only proposes a different structure with different interrelations.

Even though open source provides things such as cheap facilities or open access, that is not the focus of it. Open source culture will gain ground, not because co-operation is somehow morally right or other organization models morally wrong which is not claimed to be the case either. It will success simply because it functions better. The closed source world cannot compete in an evolutionary race with open source communities. Eventually they will be embedded to each other.

## TRENDSETTERS

Only a wizard would know what to do with the tools of open source at this point of its development. Even the ones who are developing the software constructing this culture, do not really know. We are eagerly waiting for the emergence of experiments and applications. Our history has demonstrated that the avant-garde artists are the trendsetters to be closely followed. The virtuality of internet thrilled the art scene for a while. However, we can see a movement back to the physical public spaces. The artists of today are intertwining social media to interactive locative systems. Their projects might seem innocent as play but it is important activity of testing and trial. This leads to learning, similar to a child that through play builds up new skills and examines the concept of reality.

<http://haque.co.uk/naturalfuse.php>

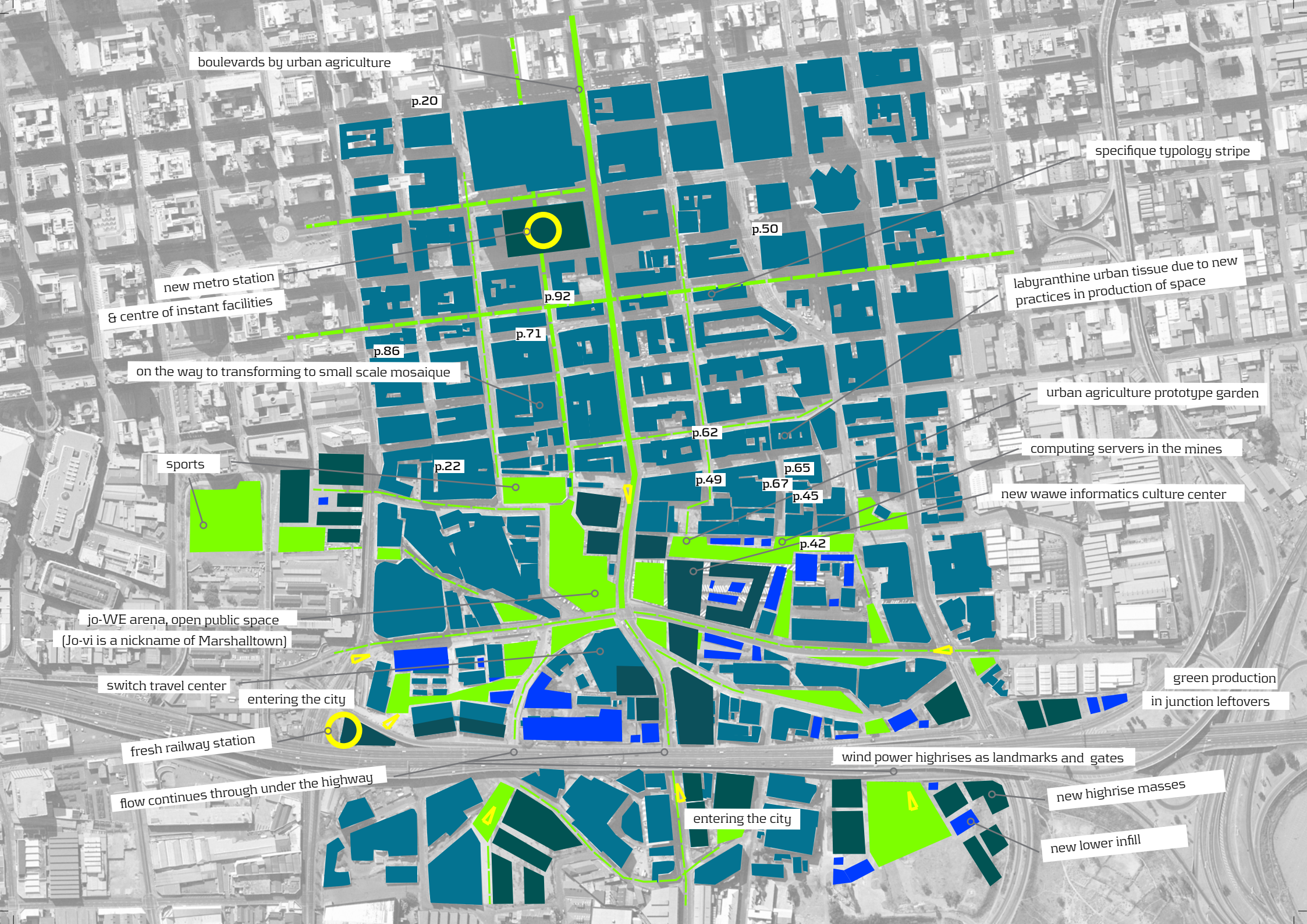
*(self-regulating electricity ecosystem)*

*Natural Fuse is a project experimenting on Pachube as a tool in creating an ecosystem of electricity in which the amount of electricity available to a household depends on the number of plants the household contains and on the well-being of these plants. The aim is to create a collective city size carbon sink that neutralizes the carbon footprint born in the production of electricity. By sharing resources and information between the plants, the energy expenditure can be collectively monitored and managed. If people co-operate on their energy consumption, then the plants thrive and all the plants can use more energy. However, if the co-operation fails, the network starts killing the plants, thus diminishing the network's energy capacity. The project is be open to public in the fall 2009.*

▷ *next spread: city-scale positive otherness; a sketch of bringing to Marshaltown an open public green space. The era of apartheid made extinct any big public spaces that could have promoted gatherings. Public space re-introduced is exactly at one of the gateways to the megapolis of Johannesburg.*

▷ *The same map approximately locates the image collages of the thesis according to pagenumbers.*

▷ *the following spread: the original images and places that have been the basis for the visions presented in collages*



boulevards by urban agriculture

p.20

specificque typology stripe

p.50

labyranthine urban tissue due to new practices in production of space

new metro station

& centre of instant facilities

p.92

p.71

p.86

on the way to transforming to small scale mosaique

urban agriculture prototype garden

p.62

computing servers in the mines

sports

p.22

p.49

p.65

p.67

p.45

new wawe informatics culture center

p.42

jo-WE arena, open public space

(Jo-vi is a nickname of Marshalltown)

green production in junction leftovers

switch travel center

entering the city

fresh railway station

wind power highrises as landmarks and gates

new highrise masses

new lower infill

flow continues through under the highway

entering the city









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