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Lifelong Learning Programme - Erasmus Virtual Campus - Reference: 134370-LLP-1-2007-1-ES-ERASMUS-EVC
Erasmus Accompanying Measures - Reference: 177090-LLP-1-2010-1-ES-ERASMUS-EAM

Innovating, Housing, Learning

Oikodomos International Conference

Brussels, 27-28 October 2011
at W&K Sint-Lucas School of Architecture
Paleizenstraat 65 1030 Brussels

Papers

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Paper:

Designing the Campus Settlement: A Studio Challenge

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Designing the Campus Settlement: A Studio Challenge

Sedef Ozcelik, Cahide Aydın İpekçi, Tarhan Arıkan

Abstract- The Cayirova Campus Settlement of Gebze Institute of Technology (GYTE) consists of three main areas where their connections are mostly isolated: (i) the area including administrative buildings and the school of architecture (ii) the area located between the railway and the sea-shore, (iii) the area where the buildings left from the Seed Certification Institute. The second year Architectural Design Studio has searched for proposals in order to build relations using the potentials of those areas such as railway/highway connections, the creek, the wood and sea-shore. There is evidence that the number of students using the campus is growing due to the increases in the acceptance of students in the recent years; and facilities are not adequate for the increasing demands. The absence/inadequacy of these facilities such as central library, dormitories and other accommodation, gathering spaces, student centre, arts & exhibition centre; lead to abundance impression when the common working hours in the campus end. This work aims to present the proposals of students who took part in this design studio. The study is conducted during the 2009-2010 Spring Semester for 14 weeks. Two tutors, one assistant tutor and 10 students attended to the studies. The project topic is presented by informing students about the integration of three main parts of the campus. Then the students are asked to develop proposals within two phases preceding each other. In the first phase, macro-scaled analysis for the particular areas of the campus is focused. The programs of proposals are formatted due to the other campus examples and students' own living experiences. Therefore, the program was not fixed and dictated, but was flexible and open to findings by the students. Students focused on integration of the neighbourhoods surrounding the campus as well as those three main parts. Different approaches were used in order to make use of the potentials of the areas; such as transportation, water element, hierarchy of greenery, user profiles, usage periods and characters of public spaces. As the first phase ended, the students were asked to focus on one particular facility within their proposal. The second phase focused on micro-scaled design and architectural approach. For the proposals of selected facilities; accessibility and sustainability were the main focus in order to create solutions. In both phases; plan, section and facade proposals; as well as the 3D visualisations-modelling and models were used in order to develop the concept. In addition, short animations and weekly sketch exercises were made.

The focused facilities are: 'School of Architecture', 'Central Library', 'Dormitory', 'Public Space', 'Student Centre', 'Auditorium', 'Water-sports Centre', 'Day-care Centre', and 'Railway Station'. Process-based, reflection-in-action teaching approach is adopted as a pedagogical model where students are the focus of Design Studio experience. The borders of the design area are left flexible and the arrangements within the neighbourhood of the campus are included. By this approach, the integrations of the campus facilities in the neighbourhood are enabled. The outcomes of the urban analysis conducted by the students are used; therefore the design studio is formed as an open-ended creative platform.

Keywords- *Design studio, campus settlement project, design teaching approaches, pedagogical models*

Introduction

In this paper *reflection-in-action* approach in the design studio is reviewed in order to constitute the basis of the paths taken to teach architectural design at GYTE in the 2009-2010 Spring semester. The integration of three segregated parts of the GYTE Cayirova Campus is focused. The duration of the semester (14 weeks) is merely divided into two phases in which the scales are identified. In the first phase the analysis are acquired in order to determine the basic necessities of the campus and to design organisation schemas in the macro scale. The second phase is developed due to the outcomes of the first phase; focusing on architectural design of one particular function in the micro scale. Enhancing students' awareness of culture, ecological and social environments, and larger social fabric, as well as developing social conscience is considered (La Harpe *et al.*, 2009). Then the outcomes of both phases are analysed and categorized to present the diversity in creativity that a *flexible* approach offers students in the architectural design education.

This study aims to present the findings and proposals of the students who took part in this particular work with respect to process-focused design teaching model. The outcomes of the studio experience are analysed in the frame of pedagogical approaches. Research may continue further as other studio practises are examined in the same manner by using design teaching methods.

Pedagogical background

The *design* of design studio teaching has been studied in order to develop design skills of students and the objectives of design teaching have evolved regarding the creative approach of architectural formation; as Goldschmidt explains, *creativity* is not a notion which can be taught, but it can be identified and encouraged (2003). The *reflection-in-action* process is coherent to the objectives of studio teaching. Dewey first used the term *reflection* and defined it as ‘an active, persistent and careful consideration of any belief or supposed form of knowledge’ (1933). Later, Schön described the concept as an innate elaborated by the already possessed (1987). The design studio context can be considered as ‘a conversation with the materials of a situation’ where the student is guided by the tutor in the process for ‘the construction of the problem, the strategies of the action, or the model of the phenomena’ (Schön, 1983).

Therefore, the design studio is the fundamental basis of the architectural education in order to produce an interactive environment. Learning in architectural studio is developed through phases: problem identification, sketching, solution development, result analysis, and presenting a final project to be critically assessed (Madrazo *et al.*, 2010). Also, the design studio aims to acquire cognitive and technical skills as creative/complex/analytical/abstract thinking, synthesis, exploration, innovation, conceptualisation, integration, perception, drawing, deconstructing, reinventing and criticising (La Harpe *et al.*, 2009).

Critical thinking in the design studio is an essential aspect of discovering forms, strategies and techniques leading to a critical attitude towards craft (Gore, 2004). By critiques instructors cover variety of issues within a particular design question relevant to the project (Goldschmidt, 2003). Matching with this statement; Çağlar & Uludağ suggest that studio brings about ‘conscientious debates’ on architectural design education focusing on extremely complicated sets of issues (Çağlar & Uludağ, 2006).

The challenge

Three areas of GYTE Cayirova Campus Settlement are segregated by boundaries such as railway, the creek, the wood and by extend campus region; approximately 364 acres (1 453 070 m²). The second year architectural design studio explored to generate integrations between them; keeping in mind that the boundaries also offer potentials as; transportation access and natural elements (Fig. 1).



Fig. 1 Current settlement of the GYTE Cayirova Campus

GYTE is founded in 1992; one of the two ‘state-research-institutes’ in Turkey for only graduate degrees. Since 2000’s the institute has undertaken bachelor degrees, while the institute is extended by other faculties. The population on campus has been growing; current data shows, there are 926 undergraduate students, 1275 graduate students, 388 academic staff and 236 staff; a total of 2825 people are on the campus. Therefore, the limited facilities struggle to serve for demands of the increasing population. The inadequacy of some facilities causes limitations of life of the campus. The users tend to leave the campus in order to fulfil such needs, which lead to abundance impression after daily working periods on campus.

In addition, the connections are poor within; (i) the area where administrative buildings and the school of architecture is situated (ii) the region between the railway and the sea-shore (iii) the north-eastern part of the campus near the wood and the creek.

Design for learning in the architectural studio

The design studio is conducted with two tutors, one assistant tutor and 10 students. The topic is presented to develop proposals within two phases preceding each other. Coherent to Marx, the main responsibility of design studio is the creation of content (2000); in the first phase, students focused on analysis and macro-scaled strategies. Each student constituted a program; with respect to his/her own living experiences on Campus. In addition, the borders of the project area are left flexible regarding the integrations between the campus facilities and neighbourhood. Also the design problem was open-ended demanding for creative perceptions; Chadwick defines flexible architectural education as a not-specifically prescribed program (2004). So, certain skills are not forcefully reproduced and architectural pedagogy is an 'ongoing, daily, lifelong experience leading to architectural maturity' (Jackson, 1999; Hickman 2001; Bothwell *et. al.*, 2004).

After first phase, particular facilities are focused for micro-scaled design regarding the product; as Ehmann defined as the creative outcome (2005). The program is also open-ended and suggests a solution for issues students choose to respond; that Habraken (1987) describes as a 'bounded area' (Goldschmidt, 1989). Goldschmidt & Weil describes this teaching approach to be fascinating, and potentially creative, or at least innovative (1998; Gharati, 2006; Petry, 2004).

Phase 1: Macro scale

The first phase is enhanced by analysis of region and forming strategies. As ‘conceptual paradigm’ defines the design process to be crucial than the final products in the studio learning experience (Fernando, 2006), other literature supports the process-centred studio approach for the integration of both conceptual and practical thinking (Demirbaş & Demirkan, 2007; Ozturk & Turkkan, 2006; Ellmers, 2006; Koch et al., 2002; Lawson, 2003; Ulusoy, 1999).

The Cayirova Campus analysed as on the south-eastern periphery of Istanbul; in the border of Kocaeli. It is one of the main industrial cities of Turkey, on the major transportation junctions. North-eastern border is a very busy highway; E-5 connecting Anatolia and Europe. The railway passes through the campus, dividing the land in the east-west directions. There are two train stations, one on the east border, where the main entrance gate is located; the other one on the west, a less busy station (Fig. 2). Students mostly defined the design problem on the basis of transportation. Other examined elements such as water, hierarchy of greenery and public spaces complemented this basic question.

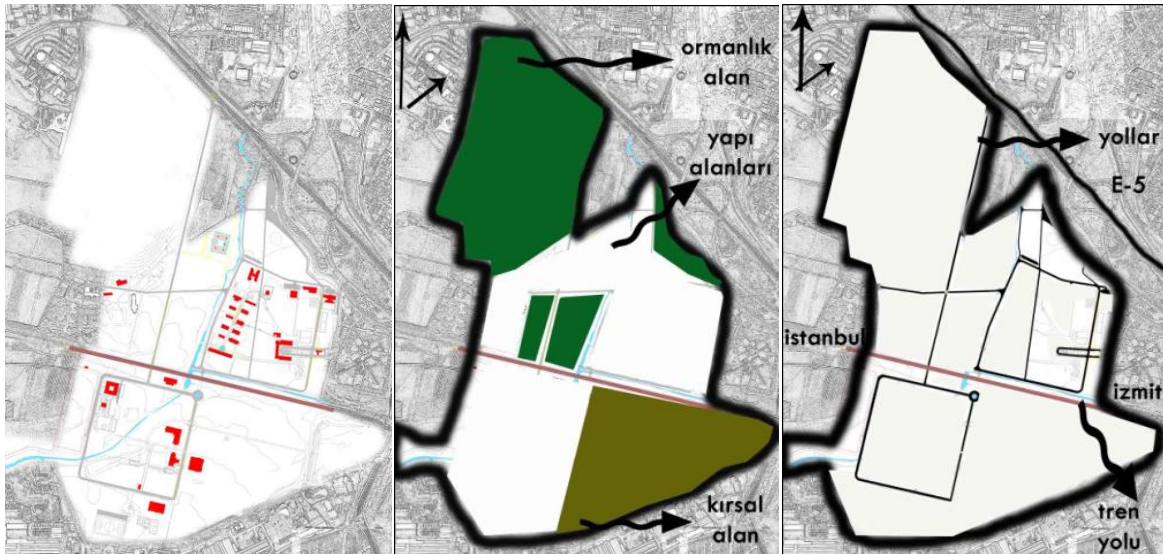


Fig. 2 Current settlement; location of buildings, types of greenery, connection paths

Water element

There are two proposals focusing on the water elements. First proposal determined the water congestion areas. The idea derived from the major flood took place on the campus during the semester that this design studio continued. The strategy was to leave the control of land to nature. Therefore, the areas suitable for congestion were turned into a lake, some facilities of the campus were scattered on the small islands, connected by bridges (Fig. 3).



Fig. 3 Water element: Proposal regarding the congestion areas on the campus

The second proposal concerning the water element focused on the connectivity feature. It basically suggested widening the creek and opening water canals circulating around the campus. The campus is conceived to be a natural park as well as a technology institute (Fig. 4).



Fig. 4 Water element: Proposal developed by enlarging the creek

Hierarchy of greenery

One proposal categorised the characteristics of greenery and named it ‘hierarchy of greenery’ since there are different types of green parts on campus. On the northern side, there is a thick wood of pine trees; while the southern part is mostly vast green fields. Also, the creek is isolated from these natural potentials. Strategy was to form a re-creative area on both sides of the creek which would integrate different social profiles both with the campus (Fig. 5).



Fig. 5 Greenery categorisations: The wood, field and re-created areas

Public spaces

Analysis presented the lacking of public spaces on campus. User profiles, usage periods and connection between the industrial area in north and residential parts in south through campus were the main indicators. Three junctions are suggested, one on the each segregated area. In the middle of them would be a triangular large public space; each corner with a different character. Northern corner is regarded as an attraction area with entertainment facilities, eastern corner as a formal academic gathering space since administration buildings are situated around and southern corner as a re-creative area due to the dormitories suggested at that part (Fig. 6).

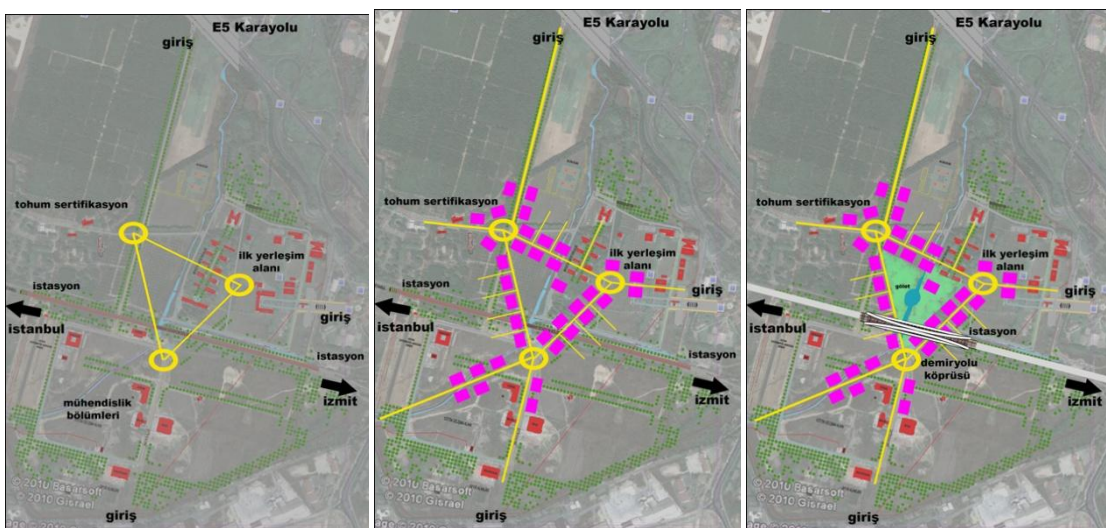


Fig. 6 Public spaces: Concept of gathering

Phase 2: Micro scale

In the second phase every student focused on different facilities such as: School of Architecture, Central Library, Dormitory, Gathering Space, Auditorium, Water-Sports Centre, Day-care Centre and Railway Station. The designs are developed as plan, section and facade proposals; as well as 3D models. Short animation films are made in addition to weekly sketch exercises in order to develop the concepts.

Dormitory

Dormitory facility is a lacking on the campus. Due to the macro-scaled strategy presenting the effective usage of bicycle by alternative paths on such an extended area, the student worked on a dormitory design enabling access of bicycles; also an entertainment point for cyclers on the roof (Fig. 7).



Fig. 7 Proposal: Dormitory on the bicycle path

School of architecture

Another proposal focused on school of architecture. The main idea was to abolish automobiles on campus so a circulation route is formed whose upper floors turned into different facilities. The program of the architecture school is constituted due the current needs of our faculty (Fig. 8).

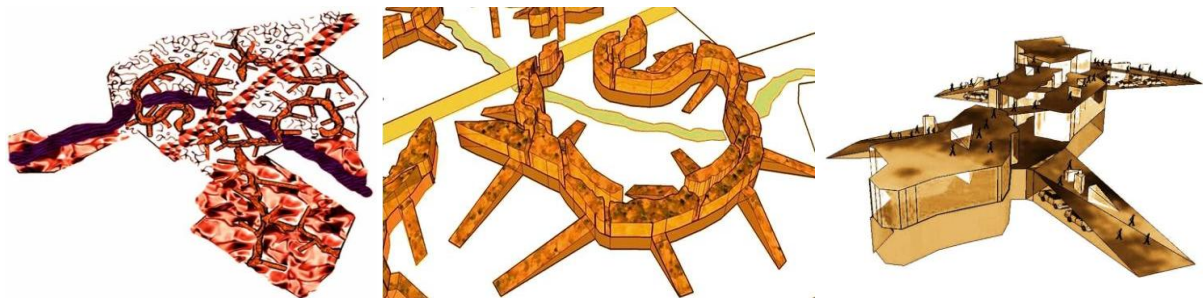


Fig. 8 Proposal: School of architecture

Auditorium

Due to another proposal, zoning is made in the macro-scale. The relevant functions are located close to each other and an organic settlement is put forward. Auditorium design is developed in the same character (Fig. 9).



Fig. 9 Proposal: Auditorium

Train station

This proposal searches for passageways and a transportation point situated on the north-south and east-west intersection of the campus. The design consists of a complicated organisation of tubes between two sides of the railway (Fig. 10).

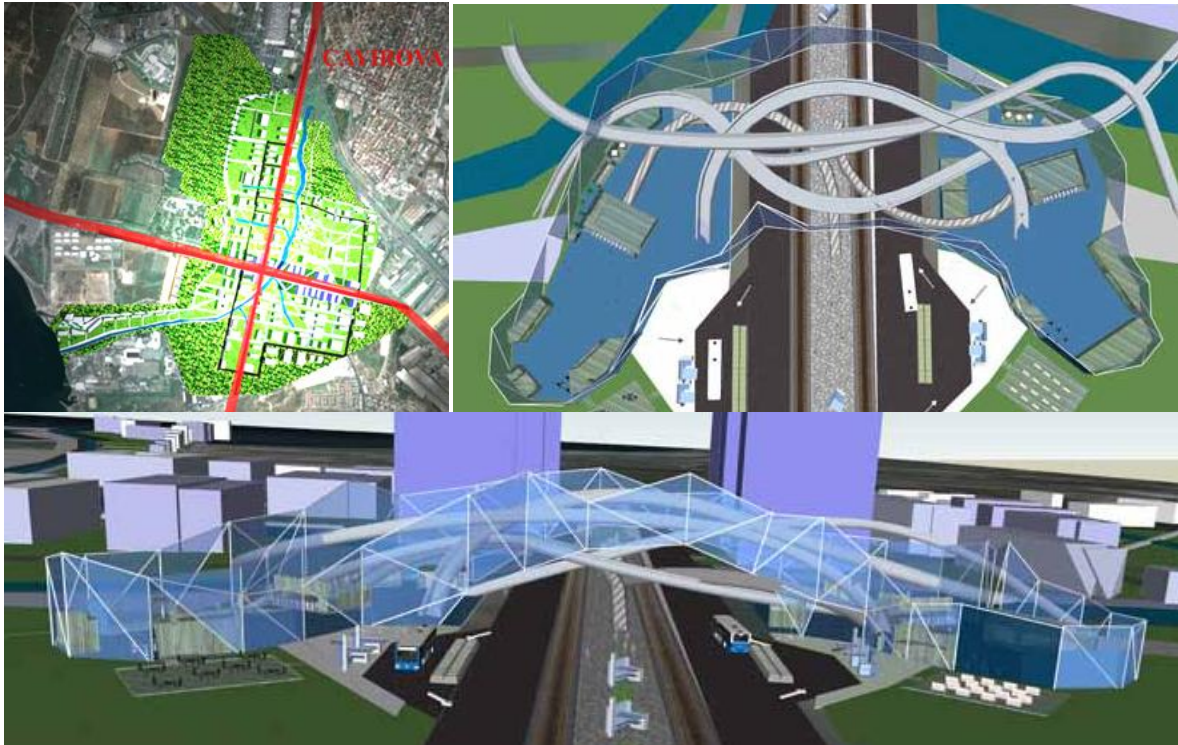


Fig. 10 Proposal: Railway station proposal

Conclusion

Outcomes of flexible architectural study conducted by the students in 2009-2010 Spring Design Studio experience are presented in this paper; regarding the studio to be a creative and experimental platform. This reflection-in-action method provided students a wide spectrum of pertinent disciplines, allowing them to open a number of doors to different aspects of architecture to begin developing their potential.

Correlation between individual creative thinking and design assignment performance is focused during the teaching process. The ability to obtain resources related to architectural design and to acquire skills about basic design principles on regional formative factors are focused. The human and natural environment relations and cultural variety are edited. The responsibility of architect about analysing owners and users' needs, due to the architect's leading role is conveyed within the two main phases of the teaching process. The necessities of a campus are studied and outcomes of the first phase are reflected as the sources of the second phase. Architectural designs of various facilities are formed due to the programs based on students' own experiences such as School of Architecture, Central Library, Dormitory, Gathering Space, Auditorium, Water-Sports Centre, Day-care Centre and Railway Station.

Further design studio work can be made in order to implement the major necessities of the campus; integrated with the outcomes gathered in this particular studio experience and responds of students can be assessed on this bases.

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Paper:

Does innovation support a better quality life?

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OIKODOMOS is a Virtual Campus co-financed by the Long Life Learning Programme of the European Union to support housing studies in Europe. In the first two years of the project, 2007-2009, OIKODOMOS has developed, implemented, tested and evaluated an innovative pedagogic model based on a blended learning approach which combines on-line learning activities carried out in web-based environments -specifically designed for this Virtual Campus- with seminars, design studios and workshops physically taking place at the participating universities. The goal of the third year project activities (2010-2011), is to consolidate the pedagogic model, to expand the Virtual Campus to other institutions and to disseminate the project results among the academic and scientific communities.

Does innovation support a better quality life?

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Abstract

Is it useful innovation in telecommunication, i.e. telematics, for the well-being? This is the topic of the proposed paper. But the question is: what is the well-being? This concept covers many different issues regarding physical aspects, behaviour attitude and social life: energy efficiency and save of many natural resource (first of all water); building/building compound management (e.g. related to ordinary garbage) and mobility (in local and wider area); participation life and appurtenances in local Community life.

Innovation by itself is not good or bad, it depends by the use of it. Innovation is inevitable when there are the technological, administrative and cultural conditions for its diffusion. But it is not "neutral" for either the proposed social models and the spatial ones. The key issue consists in the political options driving the innovation diffusion.

How to connect flows of energy with flows of information to save energy? How to substitute physical exchange by immaterial ones? How to form and to educate people, communities, residents to a smart implementation of innovation (Zeleny, 1985; Del Nord, 1991)?

More information means more stimulation of mobility, as in the beginning of the Information Age (ca. 1984) some searchers already wrote (Nilles, 1988a, 1988b quoted in Aragona 1993, 2000): how to drive telematics for a more sustainable environment? This implies a different morphology and building design, a different and new planning theory and construction criteria.

1. Tele services in the space of human being: i.e. in the city service domain

Telematics is a very strong tool for improving the material life quality of people. But is it good for the human life as a whole? To answer to this question it requires to fix that an important element of human life consists in having social relations. These ones are the basic elements for building a community. Community means and requires participation, participation is the necessary condition of democracy, i.e. of politics: the art to manage the polis, the town. Innovative telecommunications may support this condition but they have to be *free* and *affordable* by everyone. The digital divide existing either in different geographical areas (Nations and regions) and different social classes and ages (young and old persons) make the difference in the effectiveness social utility of telematics (Sassen, 1995).

Since 1984, i.e. when the United States Federal Communications Commission imposed the broken of the AT&T telecommunications monopoly (Aragona, 1993), the free market actors have become the suppliers of advanced interactive telecommunications services and devices. But without any social and cultural control this fact is creating an increasing gap in the diffusion and implementation of innovation. In the economic field all that means competitive disadvantages as researchers already underlined many years ago (Godard et al., 1986; Gillespie and Robin, 1989): innovation investments go where the demand is more capable and dense and forget the poorer and less central, populated, areas. It is interesting to underline that in Italy, when the telecommunications sector was still public one the Italian National Telephone Company (as all the National public companies for water, electricity, etc.) has to dedicate the 40% of the annual investment to the less developed regions of the country. Eu is trying to face such question by support action above all for the less developed areas: *Bangeman Report*, 1994; DG V *Suivi du Livre Blanc*, 1995; DG XIII *European Chart of the telework*, 1996; SDEC, 1999; Management Unity of the RIS+ Calabria Project (Unità di Gestione del Progetto RIS+ Calabria) *Innovation and Research Regional Plan in Calabria. Updating and Guide Lines for the Implementation 2001-2002 (Piano Regionale per l'Innovazione e la Ricerca in Calabria. Aggiornamento e Linee Guida per l'Attuazione 2001-2002)*, Calabria Region, 2001; European Commission, 1999, 2003a,

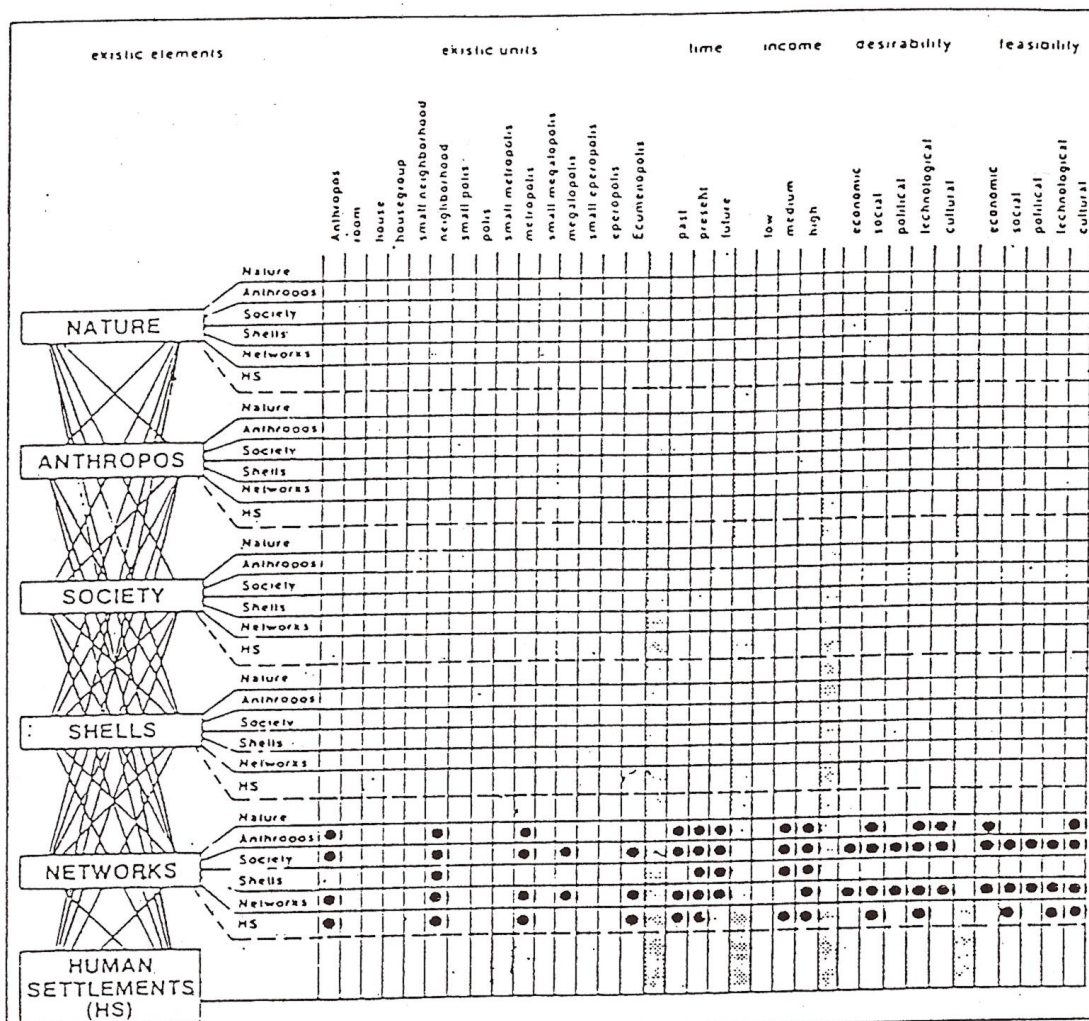
2003b; Eurocities, 2003; Espon, 2005. The effort is dedicated for either the economic activity and to increase the quality life of local communities. So the Eu intends to connect the economic development and the implementation and diffusion of the innovation.

For the wellbeing tele-services must be included in the traditional welfare system. That implies to design national, regional, local policies including: the creation of network (physical or virtual ones); the offer of technological devices able to support the innovative services; the education of users and the assistance service. All that is not substitution of the face-to-face services but a bettering of them: i.e. a grow in their effectiveness (that is the benefits for the citizen related to the costs). Of course it also must imply an increasing of their efficiency. But for having both these outcomes (higher effectiveness and efficiency) it is required a "technological culture" (Del Nord, 1991) able to overcome the technological approach in the use of innovation. As Zeleny wrote (1985) *the superior technology management must drives the management of the superior technology*.

Otherwise, if the public actor doesn't offer a public service of the innovative opportunities it will leave field only for the private players whose the main goal consists in making profit: i.e. the highest prices is possible to fix and the lowest costs they can have. All that is worsened when there is a private monopoly.

The following scheme explains the whole approach of the paper.

The anthropocosmos model



Adapted version of model for EKISTICS

Three simple examples. Telemedicine by the hospital San Giovanni in Rome. Tele control for the children at the primary school in Ravenna. Tele education (electronic teaching and assistant teaching) at the Reggio Calabria Mediterranean University, the "On line campus".

Since 2003 San Giovanni Hospital uses telemedicine for the control of heart in people that have had heart attacks. That allows a better life quality for the person, to save costs in transportation and time spending. These last elements regard not only the single one but the society as a whole. That evidences the double effectiveness in the use of telematics: the direct benefits for the well-being and the collective ones. The collective ones are often material as is the case of quoted example because save in transportation allows to diminishing traffic (first of all the private one) and consumption of energy. To close the circle it should be considered how much energy the telemedicine device requires (and how it is produced...) and to compare such quantity with the transportation costs that this telemedicine application substitutes. All this considering the effects by the demand side: also the supply side has benefits and costs but in this paper they will not be underlined because it is focused on the well-being of the citizen.

The primary school tele-watching in Ravenna allows to the parents to see how to behave their children being far (home, work places, etc.) from the school. Parents and teachers may talk each other in real time. The system is very easy, just a web camera, affordable and not expensive, friendly in the use. It is very similar to the one utilized in some Italian little cities dedicated to old people surveillance at their house. As in many questions regarding the "livable city" children and old population are involved in similar "demand": safety and social life. The implementation of the innovation can help the life condition but it is not a substitute of face-to-face relations. As in the former case tele-analyses and control can be made far from house for bettering quality of life but this does not abolish the need of direct relations. It requires a more planned and structured system able to manage these new opportunities.

Remaining in the educational system the "On line campus" by Reggio Calabria Mediterranean University allows distance education activities from everywhere for both the teachers and the students. For the social and geographical characteristics of the region - very low population density (Reggio Calabria, the most populated, has about 190.000 inhabitants, for the most in the region there are cities with only hundreds of residents) in a beautiful natural environment marked by tall mountains still isolated by the lack of infrastructures (railways, highways, etc.) - this innovation (existing since 2007) allows a better efficiency in the use of the resources. Students may travel less (from home to university and back) so saving time and costs and also the effectiveness seems to be good.

Two main questions have to be posed:

- 1) Because the mission of the university is not only to give a bachelor but also to participate to a community learning process tele-activities constitute "assistance" of the face-to-face courses and not substitution of them. So they enrich the offered formation tools.
- 2) Connected to the former point, it has to underline that a "critical mass" is required for maintaining and developing the role of central pole. The risk consists in the substitution of local tele-activity with tele-activity given from outside (far from the town or region), so decreasing the local offer i.e. the local "power" and attractiveness. This fact can be very dangerous in areas with already few activities and weak economy: the innovation "so used" increase the gap between rich and poor area. A smart (for more social and territorial equity) implementation of it may consist in building a reticular diffusive network as suggests Dematteis (2005) and a number of Eu (1999-2006) programs propose e.g. support to "Creation of network for small cities" since 1999.

2. Considering the spatial effects of innovation

In the most advanced areas the high level of technological development should allow to live without, almost, any material contact and stay at home. But people doesn't that, people want meet people. But how to meet people? Information is needed, the more information is given the more people move themselves. This evidence implies that information innovative telecommunications systems are often not substitutes of existing services or products but they propose new ones. Above all they represent the passage "from the control of process to the control of product" (Nilles, 1988b).

This may lead to a radical change in the concept of the space because a different logistics in the organization of the functions is possible. But it is an opportunity not a requirement: it becomes a need if the point of view is the public good. If the telematics services are considered only “new products” and not as chances for a new structural territorial and city design, the innovation impact is very limited.

Instead, if the awareness of the potentiality of innovation will spread many benefits can occur. The main point consists in the will to integrate the innovation in the town planning and process and in the building activities: for having that (as necessary but not sufficient condition) people, policymakers, bureaucracy, technicians need information and formation.

Telematics may increase effectiveness and efficiency but it is required a “cultured environment” (Del Nord, 1991) able to connect the diverse urban functions as housing, transportation, health, education, etc. and to evidence the material (first of all energy and land) and immaterial (save time, less stress, etc.) vantages. Many “ordinary” activities and products may be substituted by immaterial ones or “become” services so saving raw materials (e.g. for producing paper), energy (to exchange or to transport) but several others can “born” and be origin of “new” transportation mobility. But if this new demand is managed in a “smart” way, e.g. “at demand”, it is possible to save costs and time.

A multicriteria approach is required to cover all the involved elements. These have to be fixed in a matrix where the diverse components are weighed and connected. All that implies a authority that plans and gives priorities to one or other elements. So, the importance to information (for people above all) is reinforced because the legitimacy of this authority is given by the democratic support.

The last issue is very relevant, it pones questions never faced before: telematics is not a new product but a new way of thinking services, realizing urban functions, building work places and houses’ utilities, etc...

But, first of all, telematics is the promenade for the electronic democracy, that is for the electronic citizens (Rodotà, 1995). The innovation is inevitable. The question is: do we want to manage it or do we let it to “the hidden hand”? If the telematics has to be managed, i.e. if we want use it for having a better social equity (in services, job, etc...) and a more sustainable environment, electronic citizens need electronic tools and formation.

Glocalization (Robertson, 1995), integration of global and local scale need to manage the network, the networks, information and exchanges, material and not material ones, with modalities able to preserve the complexity. Lack in cultural elasticity in a continuously changing context hinders or deletes innovation. Dialogue and mediation are harder to get and so instead of the confrontation and possible encounter the outcome is head-on confrontation. It becomes difficult to start processes of collective learning (Bobbio, 1996) that is to build reflective spaces able to change the form of relations, to plasmin new identities, to rule the share of knowledge and create the awareness of the place.

In Italy, recent researches (Tinaglia, Florida 2005) put the southern towns at the last places at national level in regard the factors that determine success and competitiveness: Technology, Talent and Tolerance. While Italian medium or small cities in the Centre or North Italy (e.g. Rimini, Perugia, Modena, Padova, Pisa) are classified in a good place. However it has to be noted that these latter enjoy the advantages to be or close to metropolitan areas or in reticular networks.

The “close attitude” in the territorial systems is one of the is one of the various elements which determine this negative outcome of the South. The more a territory is inaccessible to the exchange and to the “diverse” the less it is open to the news and to the change: it is difficult having a diffused community (Stagni, 1998) where the individual is “center” and “network” at the same time, and in which uncertainty and consciousness of the knowledge borders are accepted, to learn from the mistake and to participate to form citizenship for having civitas (Cacciari, 1990) and even Urbis. All that need will to hear and to acceptance of the “outer other” .

Social and spatial transformation happen without a strategy, there is not any tentative to rebuild contexts. So innovation doesn’t lead to re-territorialization dynamics based on identity processes and towards what Bonomi (2004) calls *geocommunities*. The result is the production of homologous spaces, often conflicting and far from the cooperative criteria, remaining of the word “coopetition” only the competition and the disorder coming from the absence of participated collective public choices.



Satellite antennas and air conditioning: unplanned innovation in an Italian city.

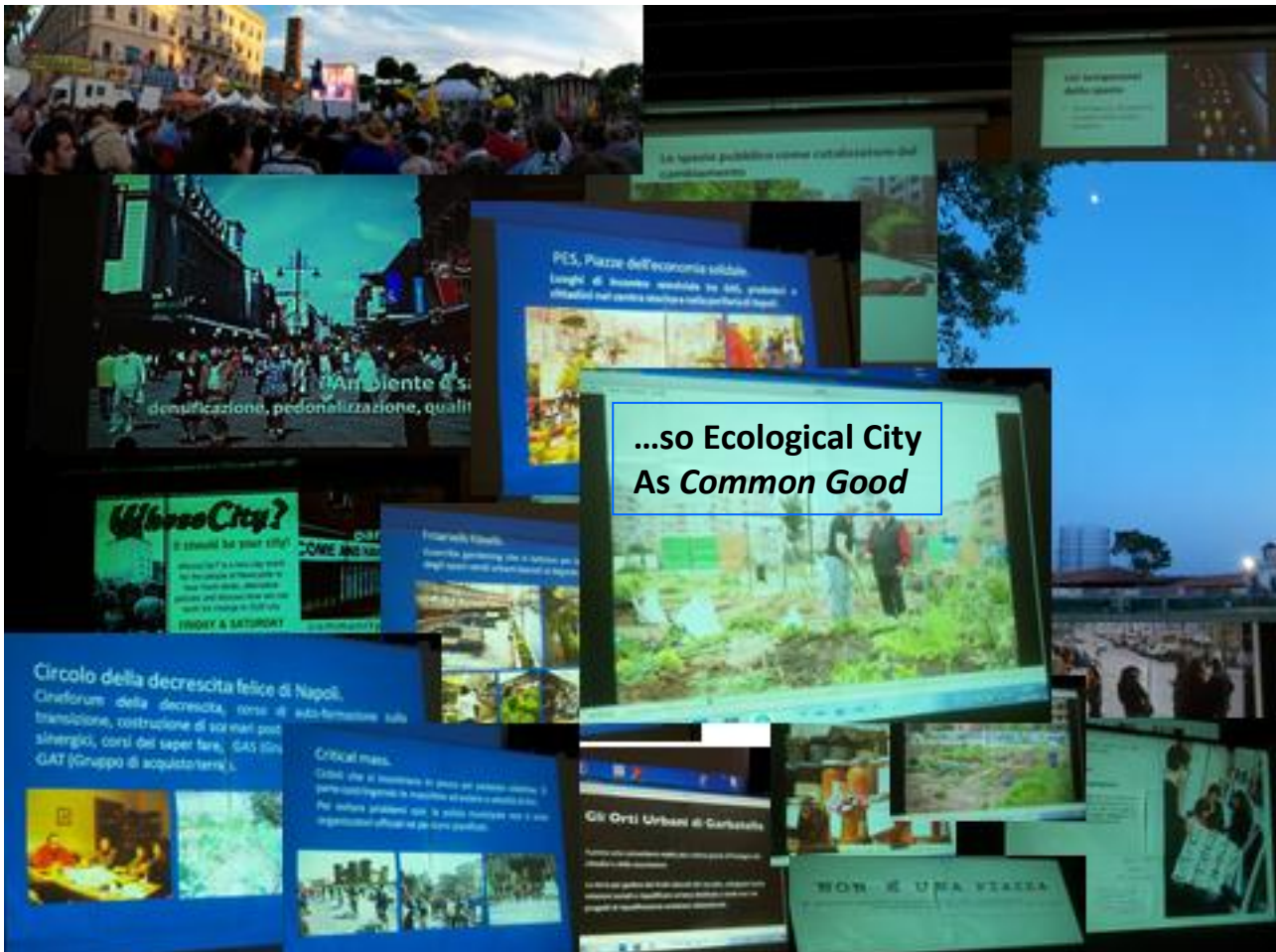
3. Some concluding words for a new space

Increase the structural complexity means to diminish entropy. Then compactness and polycentrism, specialization but not mono-functional areas and building compound.

Innovation in telecommunications, together with collective mobility for long distance, pedestrian network for local areas may help to save land and energy but all that needs strategic plans able to cope with the “free offer”. Plans and

project able to show how better is a built environment (compound and houses) structured on the bases of the flows of communications and energy.

The issue doesn't depend by higher construction costs but either a more informed designers attitude and the collective social acceptance and use of the new opportunities as they were a “common good”. This is the only path to build territories, towns, houses, according an approach ecological (Aragona, 2011) either for the material elements and the social ones.



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Innovating, Housing, Learning

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Paper:

Living Together: On the Role of Architecture in the Production of Habitable Collective Spaces

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OIKODOMOS is a Virtual Campus co-financed by the Long Life Learning Programme of the European Union to support housing studies in Europe. In the first two years of the project, 2007-2009, OIKODOMOS has developed, implemented, tested and evaluated an innovative pedagogic model based on a blended learning approach which combines on-line learning activities carried out in web-based environments -specifically designed for this Virtual Campus- with seminars, design studios and workshops physically taking place at the participating universities. The goal of the third year project activities (2010-2011), is to consolidate the pedagogic model, to expand the Virtual Campus to other institutions and to disseminate the project results among the academic and scientific communities.

living together.

on the role of architecture in the production of habitable collective spaces.

The paper reflects on the need for another approach to the concept of habitability that would allow the application of collective solutions and proposals simultaneously and transversally at all scales, from the room to the city, reclaiming the values of the collective as an alternative to the reigning individualism and atomization.

In front of those practices that either linger in the unstoppable race to produce the new and its new shapes and forms or align with neoliberal currents in the production and absorption of surplus values at the cost of the creative destruction of urban spaces and territories, one must claim the urgent need of other ways of doing and making that engage decisively and uncompromisingly in the task of designing coexistence.

It is paramount and indispensable to advance beyond the formal and typological, incorporating not only the already known discourses of adaptability, dissociation and other contemporary private rituals but also the critical design of common, collective, public and intermediate spaces that foster sociability and conviviality making the sharing of spaces, resources and experiences possible.

habitability – collective housing – community – right to the city

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fig. 1: Container of the Urban Asymetries Master program at TUDelft, shortly after the fire that destroyed the faculty of architecture building. Photo by the author of the article.

“The polis, properly speaking, is not the city-state in its physical location; it is the organization of the people as it arises out of acting and speaking together, and its true space lies between people living together for this purpose, no matter where they happen to be” (Arendt 1998:198)

Hanna Arendt presented her understanding of the city through these words already in 1958. The constitutive essence of the city lies in the set of complex relationships that take place among people. Relations that emerge, according to her *“from the doing and talking together”* and take place in authentic, real space: the one that exists *“in between people dwelling together for that purpose”*.

Instead, it seems like architects, urban planners and others insist in understanding the city and architecture as mere buildings, and furthermore, in the fact that these have nothing to do with people except for the *“annoying”* fact that, once finished, they will be inevitably occupied by hordes of *“stupid, ignorant and insensitive”* individuals. It looks as if the most important was to define, devise and, above all, formalize those objects-buildings, or in other words, an aesthetic, artistic, cultured and autonomous practice, that must not get dirty or contaminate with other issues of ethical, social or political nature that should not interfere at all in the resulting image-architectures.

If it is worrying to verify how contemporary architectural production and the debate associated to it have lost most of their social, critical, political and utopian impetus, the worries turn into indignation and disappointment when looking at the case of dwelling and the production of living environments. The results of many years of scandalous real estate, neoliberal and architectonic frenzy are now visible. The design of coexistence, the production of habitable spaces – undoubtedly the main task and function of architecture- has been abandoned in order to embrace: on the one hand, the serial and indiscriminate fabrication of non-architectures that

repeat types, materials and structural systems on the basis of a pragmatic and productive juxtaposition of normative restrictions and the interests of bankers, investors, developers and builders; and on the other hand, the dazzling production of unique prototypes of image-architecture that satisfy the ill, self-worshipping yearnings of an elite of architects abandoned to the ceaseless luxury of formal exploration, in search of new opportunities to produce the new, the stunning, the original.¹

It is difficult to understand how such an outlook along with the unsustainable situation and social emergency around the issue of housing in Spain, has not yet produced – in spite of the real-estate bubble explosion, a firm, serious and critical reaction within the profession, schools of architecture, boards or even other, supposedly critical, institutions related to spatial practices. In and around these institutions, professionals and scholars, a lot more research, deep reflection and knowledge should be produced to question current housing policies and social housing models, to understand and explore the options of cooperative housing and other modalities of alternative co-habitation, to assess the potential of interesting initiatives of self-construction that have been almost eliminated from the catalogue of public housing solutions and, more generally to approach the needs, realities and possible futures of “living together”.

The most recent European housing statistics provide only a glimpse of the Spanish disaster. In 2008 for instance, 85% of occupied dwellings are owned by its occupants, in front of a 13% of rental housing. Such percentages place Spain in the last positions regarding rental housing in Europe, only scoring better than Estonia, Rumania, Czeck Republic and Poland. (In the case of Poland there exists a cooperative sector² that represents a 24% of the total of occupied dwellings, which makes the percentage of owned dwellings drop to 64%, well below that of Spain).³

These numbers are even more revealing when compared with data regarding other European countries such as Germany, with a 54% of rental dwelling and 46% of owner-occupied; the Netherlands, with a 42% of rentals and 58% of owner-occupied; France with a 39% and 57% respectively; or countries like Denmark, with a 39% of rentals, 46% of owner-occupied and a 7% of cooperative housing; or Sweden, with a 44% of rentals, 38% of owner-occupied and 18% of cooperative housing, which makes it the country with the lowest percentage of owner-occupied of the UE.⁴

It is obvious of course that most of the rentals included in the data shown above correspond to dwellings owned by the state or diverse forms of managing companies controlled by the state or municipalities, that also take care of the maintenance and reparations required. The Swedish case is the most interesting and rich, since the state is not developing social or state subsidized housing as we know it in Spain, but regulates the market by fixing the rents in order to guarantee access to housing for all. The cooperative sector in Sweden and Denmark is so

¹ I'm not denying here the emergence, in rare occasions, of elegant, important and solid architectures resulting from rigorous investigations and determined takes on exploration and avant-garde, resulting perhaps of careful combinations of knowledge, sensitivity and desire; what I question and oppose is the current trend through which the production of “the new” and “the original” becomes and end in itself.

² The cooperative sector in Spain is practically inexistent and there is no official data available regarding its evolution or current situation.

³ Housing Statistics in the European Union 2010, pag. 64, Occupied Dwelling Stock by Tenure, %

⁴ It must be noted that the cooperative sector in Sweden is quite complex and a part of it resembles the homeowners associations that we know in Spain and other countries.

complex and at the same time interesting that it would require a whole paper,⁵ but the mere fact that such advanced countries invest and take care to articulate and maintain laws and policies aimed at fostering housing cooperatives, should at least awaken the interest among both researchers and politicians, working as a referent or setting a horizon of possibility that could encourage reforms and proposals pushing the Spanish housing pool toward the collective, boosting strategies to promote collaboration and coexistence from inception.

It might be that the most spectacular data and statistics are those revealing the frenzy of building construction in Spain, where during the years 2006, 2007 and 2008, the number of finished dwellings was 705.924, 676.914 and 652.738, respectively.⁶ The available data from the Spanish Ministry of Housing and the National Institute of Statistics is helpful to calculate the total increase in dwelling units in Spain during the 2000-2009 interval, from 17 to 26 million units. During the same period, in France for instance, the number of dwellings increased in a very different proportion, from 28 to 31 million units.⁷

This data could be combined with other information, perhaps less *scientific* but equally illustrative as the one published in Spanish media during the past few months about the real estate market, building construction sector and the Spanish banks, stating for instance that the number of mortgage foreclosures has increased from 14.000 in 2004 to more than 100.000 in 2010. The final balance is worrying, and thinking, or rethinking, possible solutions is more than urgent. Nevertheless, the problems, debates and reflections around housing are not taking a prominent space in publications, neither among professionals, nor within the study plans of most of the schools and faculties of architecture.

Paradoxically enough, even in those cases in which the issue of collective housing is explicitly undertaken, the approaches are notably *professionalist* and *autonomist*, leaving social issues and other questions mentioned above on a side and betting on educating architects to integrate in the current dynamics of the international market of architectural professionals, or in the best cases, aiming at producing the next “*starchitects*” of domestic architecture.

On the contrary, architectural publications and exhibitions present more and more stunning and dazzling images, “*literally, such is the shininess and freshness of the surface that one is seduced into believing that something genuinely new is happening*”⁸, but in fact there is almost nothing under the surface and appearance of such architectures, just a huge ethical and political void that ignores the social “real” and avoids engagement. Those practices and methods fit perfectly in the category of “fresh conservatism” that the Dutch architect and critic Roemer van Toorn proposes in order to explain contemporary architectural production and its spectacularly fresh, although empty, wrappings.⁹

⁵ For a helpful and quite complete account see the article by Dick Urban Vestbro: *From Central kitchen to community co-operation. Development of Collective Housing in Sweden* available at http://www.habiter-autrement.org/33_collectifs/contributions-33/Collective-Housing-in-Sweden-Dick-Urban-Vestbro.pdf

⁶ Housing Statistics in the European Union 2010, pag. 74, data on “Dwellings Completed per 1000 inhabitants” combined with official population statistics.

⁷ Housing Statistics in the European Union 2010, pag. 60, “Dwelling Stock by Type of Building”

⁸ Jeremy Till complains about it in his recent and lucid, “Architecture Depends”, 2009, page 15.

⁹ Roemer Van Toorn, *Fresh Conservatism, Landscapes of Normality* in Quaderns 215, Barcelona, 1998. also available at <http://www.roemervantoorn.nl/Resources/Fresh%20Conservatism.pdf>

An autonomy born out of architect's pretension of carrying a special intelligence and superior knowledge, that should be exempt of evaluation and protected from inexperienced interferences, an autonomy that, even worse, can derive into dangerous and opportunistic, darker or less, maneuvers aiming at protecting the privileges, not even of the profession as such but of just a few that self proclaim themselves the ones chosen to defend architectural quality and the cultural dimension of the discipline, on the basis of the "proved competence" of their professional production.¹⁰

The mere presence of the user is seen as threatening the architect's authority. The experience of architecture is thus the experience of the architect that seems to claim exclusive rights not only to the production but also to the interpretation and reception of the work of architecture.

Even in cases like the excellent and extensive editorial work of Aurora Fernández Per and Javier Mozas in the well-known and successful publications of "*a+t*" on housing¹¹, the result puts together a considerable amount of research focusing almost exclusively on typological and formal aspects, openly declaring its uncritical nature: "*we don't critique designs, we analyze them*" they reveal in their presentation blog.

These and other investigations have focused on disciplinary and "scientific" analysis of what happens around "housing" in the visible avant-garde of contemporary architecture, through graphics and parameters that are in no way interested in those aspects more closely related to coexistence or co-habitation. ¿Where are the statistics and data, percentages and surfaces destined to common spaces, laundry rooms, kid's playrooms, tool workshops, shared kitchens or even, simply, the rooms destined to the safe bike parking with a direct access to/from the street? Where is the data and analysis of housing cooperatives and other initiatives close to co-housing? Wouldn't it be possible to investigate and define indicators that could help explain the degree of coexistence, the possibilities of sharing, and the collective potentials in relationships with, for instance, an efficient use of energy and resources? Isn't it simply necessary to reflect about the collective?¹²

Almost forgotten remain some brilliant examples that have not received much attention but that have, nevertheless, explored the potential of "the collective" in a responsible and resolute manner. Alvaro Siza's project for the Frankelufer block in Kreuzberg as part of the IBA exhibition of 1979 in Berlin took shape on the basis of an understanding and combination of social and historical aspects, in an attempt at incorporating and reflecting the contradictory and complex character of Berlin at that time, "*dissolving the limits between history and present, between building and block, between the block and the city, between the everyday life of the block's courtyard and the public life of the city*" (Testa, 1987). Introducing thus "the common" and "the collective" not as mere objects of his design, but as its generative parameters.

¹⁰ I am referring here to the recently presented local association AxA (Arquitectes per la Arquitectura) in Barcelona, and the implications of their exclusive statutes. For a complete vision of the issue, check the blog of a counter group at <http://ntretots.blogspot.com/> and specially the article by Pere Riera on the topic at <http://arquitecturadispersa.blogspot.com/2011/05/reflexions-al-voltant-de-la-creacio-de.html>

¹¹ <http://aplust.net/about.php?idioma=es>

¹² For a wider reflection on the necessary redefinition of the concept of habitability and its implications for sustainability, see Casals, M. [et al.]. *Habitability, the scale of sustainability*. in: CISBAT 2009 Renewables in changing climate. "CISBAT 2009 Proceedings". 2009, p. 409-414.

More recently, Siza has had the chance to finish his social housing project in Bouça (Porto) that was started and partially executed between 1973 and 1977 as part of the interventions of the “*Servicio de Apoio Ambulatorio Local*” (SAAL). Conceived in a context of social, political and economical emergency in the country and as part of a series of interventions aiming at tackling the lack of affordable housing, the original design already included common spaces, community rooms, collective courtyards and access galleries as central elements.



Fig. 2: Series of Pictures taken at the social housing complex in Bouça, Porto. Design by Álvaro Siza, 1973-2006. Photos by the author of the article.

In the more recent second phase of restoration and extension (2001-2006) Siza has continued exploring the role of these and other collective spaces such as the “patio”, learning from the diverse ways of doing and making developed by the inhabitants of the original design and making diverse new forms of occupation and seizure of the space possible. The new inhabitants integrate silently in the dynamics of appropriation of in-between and common spaces, giving rise to a quiet, inhabited, shared and vital environment.

Wouldn’t it be appropriate to retake certain modesty that allowed dealing with the construction of our “habitat” in less shouting and grandiloquent terms? Isn’t it possible to think architecture a bit more as a comfortable and changing container of the diverse practices of everyday life and less as a rigid and static “stage” or representational device?

The interesting work of the research group *Habitar*¹³ is moving forward in the direction suggested by these questions. From Barcelona, they have conceived and organized a series of exhibitions entitled “*Rehabitar*” (Re-Inhabit) as a set of nine episodes that progressively take place in and around the space of “Arquerías de Nuevos Ministerios” in Madrid, exploring the possibilities of re-inhabiting our dwellings, understanding that process as a way of “*using again the house and its spaces in the simplest, truest and most uninhibited ways, knowing that rather than refurbishing the spaces we inhabit, we should change the ways in which they are used*” (Monteys et al., 2010).

¹³ http://www.habitar.upc.edu/?page_id=403

The exhibition and the work of these researchers contains, among other things, a much needed critical reflection on housing in Spain that should at least lead to numerous debates and reactions.

Among their proposals and provocations destined to “*subvert the use we make of the home in order to infuse it with new life*”, one can find most of the essential and urgent questions regarding housing today, and a number of interesting points of departure for possible alternative ways to design domestic space, that, perhaps only implicitly, contain diverse winks to notions of “the collective”: “*re-inhabiting ground floors*” as a way to “infect” the street with domesticity and dissolve the limits of “the public”, “*re-inhabiting the street*” in an attempt at giving back its truly public condition to urban space through the introduction and addition of other uses, re-inhabiting the apartments and blocks by means of satellite-rooms, rethinking the position and amount of doors in a dwelling, or questioning the diverse possibilities of access and entry, the relations of certain rooms with others or the predominance of the living room over the other rooms of the house.

The importance of such research and exhibition lies precisely in its taking a critical standpoint regarding the localized reality of the Spanish housing market and situation, and moreover, in the easiness and naturalness with which “dwelling” is understood as not only happening in the realm of the room or the apartment but as taking place in other intermediate or in-between spaces, exteriors, satellites, common spaces, public zones, the street, public space... the city. Their position is also, of course, decisively moving away from dark and idolizing elitisms of untouchable (perhaps also un-usable or uninhabitable) architectures and, more or less explicitly, betting on the user, the inhabitant, that shows up in drawings, models and texts, as undeniable protagonist of dwelling proper, before and above an architecture that should serve coexistence.

How come there aren’t any other voices, research, reflections, experiences, critique and proposals centered and focused on the dweller? Isn’t it possible to extract useful reflections and ideas or to take some experiences and radical proposals from the past - that perhaps contain the essential collective ingredients - as points of departure? Wouldn’t it be relevant at least to revisit other ways of understanding “habitability” in other historical moments?



The functionalist manifesto “*acceptera*”, signed by Gunnar Asplund, Wolter Gahn, Sven Markelius, Gregor Paulsson, Eskil Sundahl and Uno Åhrén in 1931, foresaw some necessary changes in the home for it to adapt to the new social reality and already announced then a future in which dwellings would be complemented with other collective rooms, functions, systems and facilities. On the side of some of the movement’s flawed proposals and their particularly radical rejection of historical legacy – albeit understandable in the context of their time – their reflections on the need to transform domestic space, and specially, around the implementation of collective and shared solutions, can be considered as an excellent point of departure for the task of rethinking the possibilities of living together.

Fig. 3 Cover of the functionalist manifesto “*acceptera*”, 1931.

“We have already pointed out how the functions of the home are reduced in some aspects. [...] A good part of food preparation, that would also take place in it, is now carried out in factories, as much as the tasks of sawing and finishing of clothes, etc. Entertainment, that was one of the domestic activities, can be found now in theaters, cinemas, associations and other more or less public attractions” (Asplund et al., 1931: 72)¹⁴ Adding immediately after: “But the home will be probably complemented in the future in other ways, with collective rooms and services of diverse nature” (Asplund et al., 1931: 72) And bringing in some examples: “When the parents work outside of the home and lack the possibility – or in some cases the interest – of maintaining domestic service, children cannot stay home without vigilance during working hours. Playing rooms and “babykeeping-rooms” (spädbarnskrubbor) will then have a function to fulfill. [...] Laundry rooms with washing, drying, ironing and folding sections are nothing new, and heating is since long distributed from collective stations” (Asplund et al., 1931: 73)

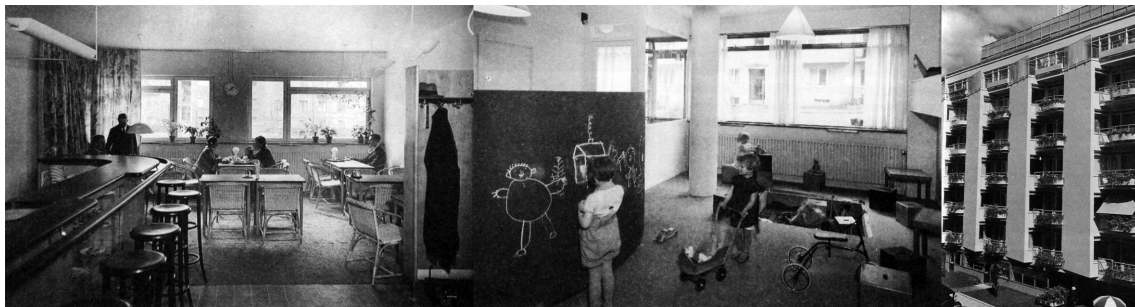


Fig. 4 *Kollektivhus*, John Ericssonsgatan, Stockholm, 1935. Sven Markelius. Dining room, space for children and main facade.

Wouldn't it be reasonable to retake some of these ideas and to rethink the possibilities and potential of common uses, equipments, services and rooms? Laundry rooms, ironing and folding spaces would allow for instance to take washing machines and tumble driers out of the domestic space, which would gain those m2 for other, more interesting uses. Moreover, the use of industrial and collective washing machines and driers does not only reduce the sheer number of machines and waste but does also affect long term maintenance and management costs since these equipment usually has a much longer life cycle than domestic machines.



Fig. 5 Some collective spaces in the cooperative housing complex *Bostadsrättsföreningen Tegelslagaren* in Göteborg; Ragnar Dahlberg, 1946. Interior common spaces: Tvättstuga, Torkrum, Mangelrum (Laundry room, drying room, ironing and folding room) Photos by the author of the article.

¹⁴ All the quotations from the functionalist manifesto “acceptera” are translations from the original in Swedish by the author of the paper.

These advantages, at the level of pure efficiency, meet the current preoccupations about energy consumption and efficient use of resources, but are by no means as important and beneficial as those derived from the very fact of sharing spaces and services, which importantly increases the probabilities of co-presence in common spaces and thus the actual cases of interaction and socialization.

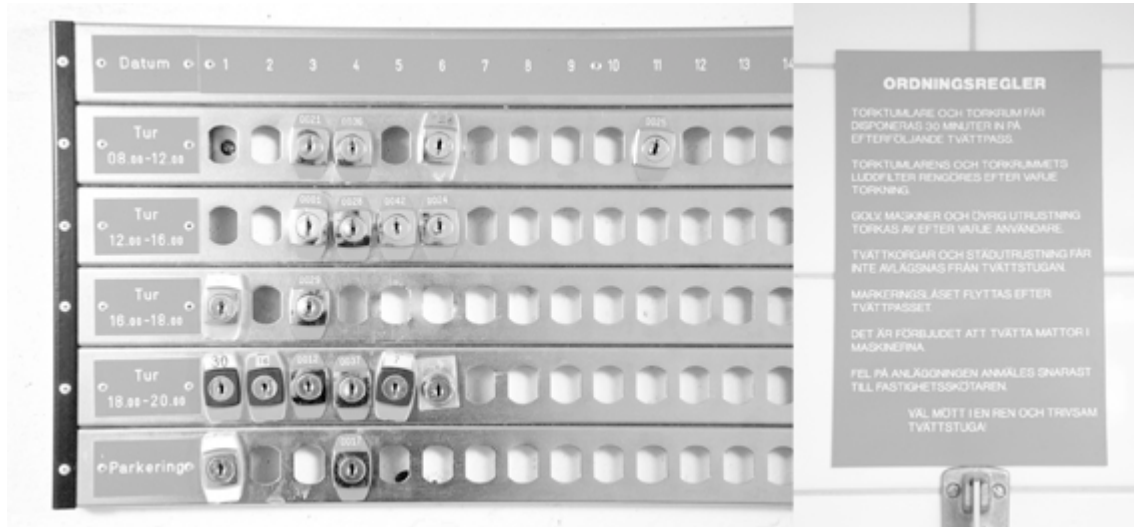


Fig. 6 Some collective spaces in the cooperative housing complex *Bostadsrättsföreningen Tegelslagaren* in Göteborg; Ragnar Dahlberg, 1946. System for booking washing and using times in the laundry room; and view of the rules of usage and order. Photos by the author of the article.

In the same direction, the well-known argument that justifies the elimination or reduction of interior and exterior common spaces claiming that they are too expensive to maintain can be easily contested by means of a good managing program run by the inhabitants themselves, who acquire not only a responsibility and a task to fulfill but also a sense of participating and belonging to a community or group. Community work carried out by the inhabitants means notable savings that make investments in reparations, maintenance or acquisitions of new collective machines or equipment possible.

It is obvious that these kind of collective collaborations is more feasible within housing cooperatives, but just a few simple changes in the ways owner's associations are conceived, combined with incentives and information programs would surely facilitate the adoption of such collective dynamics in a massive and voluntary way. Returning to the Swedish case, it is quite common in the cooperative communities of that Scandinavian country to agree on some dates in which most of the inhabitants/neighbors will meet in gardens and common spaces in order to take care of the maintenance and reparations or improvements of those spaces. A playful and joyful atmosphere usually defines these encounters that often lead to interesting collective lunches, dinners or barbeques held in some of the common spaces around the houses, conveniently equipped for such activities.



Fig. 7 Cooperative housing *Bostadsrättsföreningen Tegelslagaren* in Göteborg; Ragnar Dahlberg, 1946. Exterior spaces, general view of the accessing corridors to the blocks. Städdag (Cleaning day), 2011. Photos by the author of the article.

But it is not even necessary to look for examples or references out in Europe in order to have the right approaches to dwelling that incorporate scales other than those strictly limited to the home premises and thus make a more collective vision feasible: the Spanish regulations in terms of habitability in other historical moments have understood it in a much wider sense than the one reflected in the norms approved and enforced today by each regional government (Comunidades Autónomas). Both the “*Ley de Casas Baratas*” (Affordable Housing Act) from 1922, and the “*Ley de Viviendas de Renta Limitada*” (Limited Rent Housing Act) from 1955, explicitly referred to common rooms and spaces, courtyards, exterior spaces and gardens, etc... considering them all as constituent parts of the dwellings.¹⁵



Fig. 8 Cooperative housing *Bostadsrättsföreningen Tegelslagaren* in Göteborg; Ragnar Dahlberg, 1946. Exterior spaces, detail of the working group. Städdag (Cleaning day), 2011. Cooperative housing

In those regulations, the home was moreover linked to other realms and spaces of the urban environment, as well as to other services and facilities, understanding thus the act of dwelling as happening simultaneously at all scales, from the domestic space of the home to the city.¹⁶

¹⁵ “Reglamento Provisional para la Aplicación de la Ley de Casas Baratas de 19 de Diciembre de 1921, Capítulo 1º, Sección 1ª, Artículo 2º. Gaceta de Madrid nº 209” 28th of July 1922, pag. 364

¹⁶ For an overall vision of the normative evolution of the concept of habitability in Spain, please check CASALS TRES, Marina and Joaquim Arcas Abella (2011), ‘Habitabilidad, un concepto en crisis. Sobre su redefinición orientada hacia la rehabilitación’, in *Informes de la Construcción*, Vol. 63, No. Extra, Madrid

These kind of approaches to the idea of “the collective” and to a wider understanding of habitability cannot be found even in the most recent research nor in the most interesting and radical proposals of the last decades, which have continued to focus on the interior of the home and on typological and formal aspects that of course shouldn’t be left aside either.

Well known, although not so well applied, are the discourses reclaiming an adaptation of existing dwellings to the new family structures and alternative forms of co-habitation by means of diverse strategies to transform domestic interiors and layouts. Several systems have been explored or rehearsed in order to make the space of the home more flexible – in “more or less illusory” terms – questioning the hierarchies of rooms and the rigid oppositions between public-private or day and night; more interesting dissociation devices that “*deconstruct the integrity of the home*”(Sabater, 1995) giving rise to diverse spaces of appropriation and/or encounter, intimate sometimes, that oppose the hegemony of the living room; or even proposals that literally separate “*satellite*”¹⁷ spaces or rooms, which not only transform the home into a system capable of hosting a more complex set of attitudes, habits and situations, but do also hold a collective potential in as much as they are conceived as parts to be shared with others.

The continuity and transparency of modern space has also been questioned, those spaces in which “*the gaze controls everything and intimacy is missing*”(Eleb, 1995), as well as the existence of *servant* spaces that could be gained as dwelling space: making kitchens and bathrooms bigger for instance, opening or illuminating the latter, or simply widening and transforming corridors into places with the help of adequate furniture.

It is true that, as always, there have been a number of exceptions, and specially during the last few years one can find interesting proposals that address some of the most serious problems that have been pointed out or manage to solve some of the typological issues mentioned above; but we cannot say that these initiatives and explorations are receiving attention hardly comparable to the one generated by other “media” architectures.

In any case, with rare exceptions of interesting experiments rehearsing the incorporation and widening of access galleries as spaces available for temporary appropriation and potential interaction, the questions related to dwelling together, co-existence, community and collective elements and spaces are not being addressed. Either they don’t apply, as a result of rigidity and inadequacy of administrative and normative frames, or they are not found interesting or attractive fields of inquiry and experimentation.

The discipline throws itself into the production of architectures of high media impact and greater iconicity, if it is necessary by means of artifices, tricks and disguises that present mediocrity in sophisticated and opportunistic wrappings. A case of such extreme cynicism is for instance the recent work of Gert Wingårdh for one of the biggest Scandinavian producers of “catalogue houses”, the Swedish A-Hus¹⁸. The collaboration of the Swedish architectural media star with the manufacturer of detached house has been carefully wrapped in “green” paper, in a move that tries to take advantage of current sustainable trends and “green wash” campaigns, with a proposal for a supposedly “ecological” home whose inhabitants would achieve a reduction in their CO2 emissions from 7 to 1 ton/year per person.

¹⁷ More on this can be found in Monteys, Xavier y Fuertes, Pere (2001) “*Casa Collage, Un Ensayo sobre la Arquitectura de la Casa*”. GG, Barcelona.

¹⁸ See the company’s webpage and the projects “1 tonne hus” and “Bright Living”: www.a-hus.se

In spite of the diverse “sustainable” and technological gadgets with which the house is equipped (as a result of “close” collaboration with numerous other companies interested in the project) and the equally sustainable proclamations with which the prototype is presented, it is in fact a detached, single-family house of considerable surface and volume, designed to host a specific type of family whose lifestyle and consumption patterns are not those of a low energy and footprint profile. It is essentially a design that encourages unsustainable models of land occupation and resource consumption. Even though it is in fact a modest assignment – the design and development of 3 prototypes and the construction of 1 house – its impact on the media is huge, what explains the unusual interest and dedication put into the project by the architect himself.



The same office does not show equal dedication or innovative enthusiasm when it comes to solve collective housing assignments, what often leads to conventional and not-so-flexible solutions and typologies in their usual designs. Their proposals not only neglect the collective aspects reclaimed throughout this text but also fail to adapt to new social structures, habits and families, even showing clumsy or awkward layouts.

Fig. 9 Presentation image of the prototype *Bright Living No.2* with the family that lives in the house as part of the *1-tonne-hus* project, resulting of a collaboration between *A-hus* and Gert Wingårdh.

Meanwhile, other examples with no media impact at all rehearse innovative and interesting solutions that address, at least, the typological renovation of domestic space. Nevertheless, the aspects related to the meaning, conception, administration, function and value of that what is collective in front of that what is individual are almost always left out, and it seems like today’s architectures and urbanisms keep on having strong interests in designing exclusively for the private and individual realms.

In one of his last projects in the north of Sweden, Ralph Erskine received the assignment of



designing a small residential neighborhood in collaboration with one of the housing companies controlled by the municipality. The design was finished in 1989 and is known as *Träsnidaren*, a name taken also by the cooperative association that manages it. It is a part of a slightly bigger area designated as *Östermalm*, which marks the end of a relatively compact urban center in its eastern side. The complex included 23 buildings and a total of 221 dwellings, combining several typologies of 60, 73, 77, 90, 120 and 130 m² of surface and experimenting with diverse organizational devices in their interiors.

Fig. 10 Orthophoto showing the situation of the swedish housing development *Träsnidaren* in the neighborhood *Östermalm* in Umeå, Sweden. Design by Ralph Erskine, 1989. Picture available through Google Maps, downloaded in September 2011.

More interesting than the resulting typologies are the in-between and collective spaces that Erskine was capable of articulating so as to make them easy and accessible for everyday life usage. Interaction happens almost in a natural way and the area has become in a few years one of the most popular in the city. Young couples and families, pensioners, students, university professors and researchers, as well as immigrants share spaces and an interest to enjoy a quiet and pleasant environment without fences, cameras and other surveillance or control devices.



Fig. 11 Series of pictures showing some common spaces of the housing complex Träsnidaren in the neighborhood *Östermalm* in Umeå, Sweden. Access corridor, children's garden and collective building with office, meeting/events room, laundry room, gym, sauna and guest rooms. Ralph Erskine, 1989. Photos by the author of the article.



Fig. 12 Series of pictures showing some common spaces of the housing complex Träsnidaren in the neighborhood *Östermalm* in Umeå, Sweden. Accessibility from one of the courtyards, in-between spaces of diverse dimensions and bike parking. Ralph Erskine, 1989. Photos by the author of the article.

All in all, one wonders whether it may be necessary to critically rethink the conditions of habitation resulting of the two contemporary forms of residential formation and urban growth *par excellence*, the sprawling suburbia of detached houses, and the peripheral suburbias of collective blocks. It might be that an inversed reading *a-la-Zizek* is possible, one that against the generalized trend of idealizing the environment of those single-family, detached-housing developments and presenting them as the dream of each and every middle class family – often referring to the inherent security, privacy and community values that they are supposed to guarantee – dared to describe them precisely as the very locus of some of the worst contemporary horrors: the suburbia of isolated, detached houses is, in fact, terrible; not only the voluntary enclosure of its occupants in capsules of exclusion, but also the expression of spatial, social and communicative failure derived from extreme forms of individualism and capitalism.



Fig. 13 Frame still from *Hundstage* by Ulrich Seidl. Fragment.

Zygmunt Bauman explains, in a remarkably eloquent way, the process that leads people to opt for such a degree of isolation: “*The drive towards a ‘community of similarity’ is a sign of withdrawal not just from the otherness outside, but also from commitment to the lively yet turbulent, invigorating yet cumbersome interaction inside*” (Bauman, 2003:110) In order to denounce then the problems and side effect of such a retreat that would seriously and decisively affect the ability of their protagonists to co-exist: “*The longer people stay in a uniform environment – in the company of others ‘like themselves’ with whom they can socialize perfunctorily and matter-of-factly without incurring in the risk of miscomprehension and without struggling with the vexing need to translate between distinct universes of meaning – the more they are likely to ‘delearn’ the art of negotiating shared meanings and a modus convivendi*” (Bauman, 2003: 111)

The disturbing filmic constructions of the Austrian director Ulrich Seidl offer a perfect illustration of such horror. Through diverse narrative devices that reinforce the potential of film as an alternative apparatus of spatial critique, Seidl reveals the horror within the familiar and the

known, presenting the everyday lives of the inhabitants of suburban Vienna in such a way that their various forms of human and everyday oddness are amplified, with the intention of generating the necessary distance from the audience to avoid a passive spectator. His work masterly explains how the horror of such a capsular society is rooted in a sort of communicative collapse: “*Since they have forgotten or neglected to acquire the skills necessary for living with difference, it is little wonder that such people view the prospect of confronting strangers face-to-face with rising horror*” (Bauman, 2003:111) “*Mixophobic paranoia feeds upon itself and acts as a self-fulfilling prophecy. If segregation is offered and taken up as a radical cure for the danger represented by strangers, cohabitation with strangers becomes more difficult by the day*” (Bauman, 2003:113)



Fig. 14 Frame still from *La Haine* de Mathieu Kassovitz

The same kind of inverse reading can be applied to the reviled sets and groups of collective housing blocks in the suburban peripheries of modern cities that, as opposed to the frequent *dystopic* descriptions of crime, insecurity, unhealthiness and *ghettoization*, could be seen as enclaves of enhanced socialization, co-existence, acceptance of difference and spirit of community, nourished in many cases by a common feeling: that of being segregated, excluded, symbolically and territorially expelled from the visible space of the city.

In this case, the excellent work of Mathieu Kassovitz in the film *La Haine* can serve also as a complementary illustration. The main characters, Vinz, Huber and Saïd, a Jew, a Black and an Arab, fight to survive in the periphery of Paris. In spite of their diverse origins, they inhabit the *banlieue* together and, for instance, are also together outraged at the attack against the gym that Hubert is running. The flat roofs are taken by the youth who, collectively, organize their encounters, meals and meetings; and the square and the intermediate spaces in-between blocks are activated at the beat of the music that a dj-neighbor has chosen to share from his wide-open windows. “*Jusqu’ici tout va bien*”. They are, in fact, not the causing agents but the object of hate and rejection projected by those who consider them alien and other, those who have segregated them socially and spatially in order to protect themselves from difference; those who have, from the centre, pushed them away to the periphery.

It might be not only necessary but interesting to rethink the collective values and dynamics of coexistence latent and present in these dwelling ensembles, extracting the keys with which to contaminate the closed, endogamic and tidy spaces and enclaves of the visible city and its neoliberal and individualistic suburbias: free of difference.

It is an unavoidable social and architectural challenge to face the real housing problems of these times and to extend the right to a home and to the city to everyone. Wouldn't it be necessary to dedicate much greater and serious attention and work to the designing of a common habitat? Let's think together in order to live together.

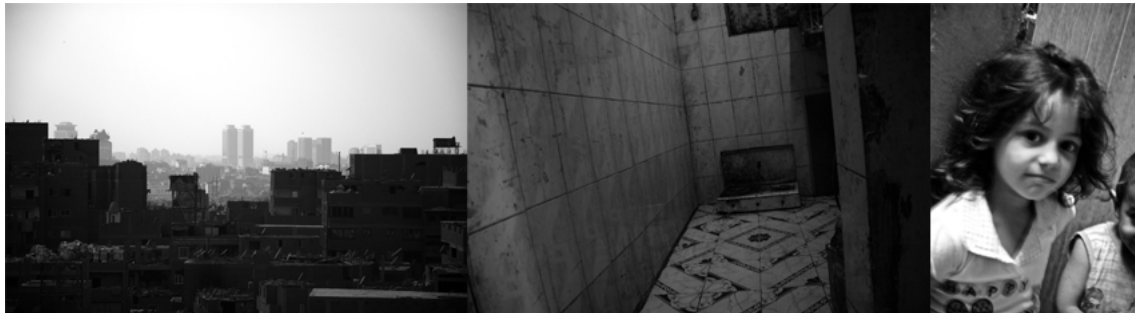


Fig. 15 Series of pictures taken as part of a research project and collaborative pedagogy experience in an informal settlement of El Cairo known as “Garbage City”, resulting from joint actions of the Locus Foundation, Umeå School of Architecture and a few local organizations. A general view of the settlement in relation to the centre of Cairo has been combined with a snapshot of one of the kitchens and an image of one of the 10 children that live in the same house with their parents. Photos by the author of the article.

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ORIGIN OF THE IMAGES

Figuras 1, 2, 5, 6, 7, 8, 11, 12, 15: Photos by the author of the article.

Figura 3: Wikipedia Commons. Acceptera.

http://commons.wikimedia.org/wiki/File:Acceptera_1931b.jpg?uselang=sv

Figura 4: Wikipedia Commons. Kollektivhuset, John Ericssonsgatan (Sven Markelius)

http://commons.wikimedia.org/wiki/File:Kollektivhus_Markelius_2.jpg?uselang=sv

Figura 9: <http://www.a-hus.se> and Gert Wingård Architects. Advertising of the 1-tonne-hus project.

Figura 10: Google Maps, Orthophoto.

Figura 13: Frame still of the film extracted from the available press material in the director’s webpage, <http://www.ulrichseidl.com/>

Figura 14: Captured frame stills from the film *La Haine*.

IMAGE DESCRIPTION

Fig 1. Container of the Master program Urban Asymmetries at the Faculty of Architecture in TUDelft, shortly after the fire destroyed the main building of the faculty. Photo by the author of the article.

Fig. 2: Series of Pictures taken at the social housing complex in Bouça, Porto. Design by Álvaro Siza, 1973-2006. Photos by the author of the article.

Fig. 3 Cover of the functionalist manifesto “acceptera”, 1931.

Fig. 4 *Kollektivhus*, John Ericssonsgatan, Stockholm, 1935. Sven Markelius. Dining room, space for children and main facade.

Fig. 5 Some collective spaces in the cooperative housing complex *Bostadsrättsföreningen Tegelslagaren* in Göteborg; Ragnar Dahlberg, 1946. Interior common spaces: Tvättstuga, Torkrum, Mangelrum (Laundry room, drying room, ironing and folding room) Photos by the author of the article.

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Innovating, Housing, Learning

Oikodomos International Conference

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Paleizenstraat 65 1030 Brussels

Paper:

Implementation of Mass Customization Strategies in Housing: Survey and Reflections

Authors:

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OIKODOMOS is a Virtual Campus co-financed by the Long Life Learning Programme of the European Union to support housing studies in Europe. In the first two years of the project, 2007-2009, OIKODOMOS has developed, implemented, tested and evaluated an innovative pedagogic model based on a blended learning approach which combines on-line learning activities carried out in web-based environments -specifically designed for this Virtual Campus- with seminars, design studios and workshops physically taking place at the participating universities. The goal of the third year project activities (2010-2011), is to consolidate the pedagogic model, to expand the Virtual Campus to other institutions and to disseminate the project results among the academic and scientific communities.

IMPLEMENTATION OF MASS CUSTOMIZATION STRATEGIES IN HOUSING: SURVEY AND REFLECTIONS

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ABSTRACT

This paper presents a critical analysis of different efforts, and approaches towards mass customization of housing. It focuses primarily on the application of computational design techniques to support users' participation in the design of their homes. An overview and a description of the concept and strategies are presented followed by a detailed appraisal of various systems that have been proposed to assist in implementation. Finally, a generic methodology for the design of design systems for housing is proposed.

INTRODUCTION

Advancements in design and production technologies lead to the emergence of a new paradigm. It was anticipated as a technological capacity in 1970 by Toffler, in his book "Future Shock" and was delineated, as well as named by Davis in his 1987 book titled "Future Perfect" as mass customization. Later on, the process for achieving mass customization was systemized by Pine in 1993. Mass customization could be applied to a wide range of products including investment goods, such as machinery, telecommunication systems, but also customer goods such as cars, furniture, personal computers and watches.

The building industry is considered a suitable domain for application of mass customization as buildings are mostly unique, highly customized products. Individual components in buildings could be mass customized to allow for optimal variance in response to differing local conditions, such as uniquely shaped and sized structural components, variable window shapes and sizes (Kolarevic, 2005).

Housing, a vital sector in the building industry, witnessed a renewed surge of interest in prefabrication during the last two decades. This interest manifested itself in multiple forms and constituencies, resulting in pragmatic solutions based on design, manufacturing and shipping strategies. It also paved the way for new territories of digital innovation that redefined the relation between design and production (Bergdoll, 2003).

This paper is about the application of computational design techniques to enable implementing mass customization in the housing industry. It also presents a detailed

overview of previous research in the area of mass customization of housing. Accordingly, the paper is designed to the following structure: first, an overview and a description of the concept and strategies are presented followed by a detailed appraisal of various systems that have been proposed to assist in implementation. Finally, a generic framework for the design of design systems for housing will be proposed.

MASS CUSTOMIZATION STRATEGIES

Mass customization refers to a production strategy that aims providing customers with individualized products at near mass production efficiency. Recently, most companies have to offer a range of choices, in order to remain competitive.

There are various strategies to adopt mass customization based on two main characteristics: the point of customer involvement in the design process and the type of modularity. Processes in which customer involvement comes early in the production cycle result in more customized products. Accordingly, five strategies could be defined:

1. *Pure standardization*: standard products
2. *Segmented standardization*: product assembly using standard parts
3. *Customized standardization*: assembly of standard products, with configuration according to customer demand
4. *Tailored customization*: products where the customer can have materials or extra equipment of choice, but constrained by the basic design of the product.
5. *Pure customization*: products specially designed for a specific customer (Da Silveira, 2001).

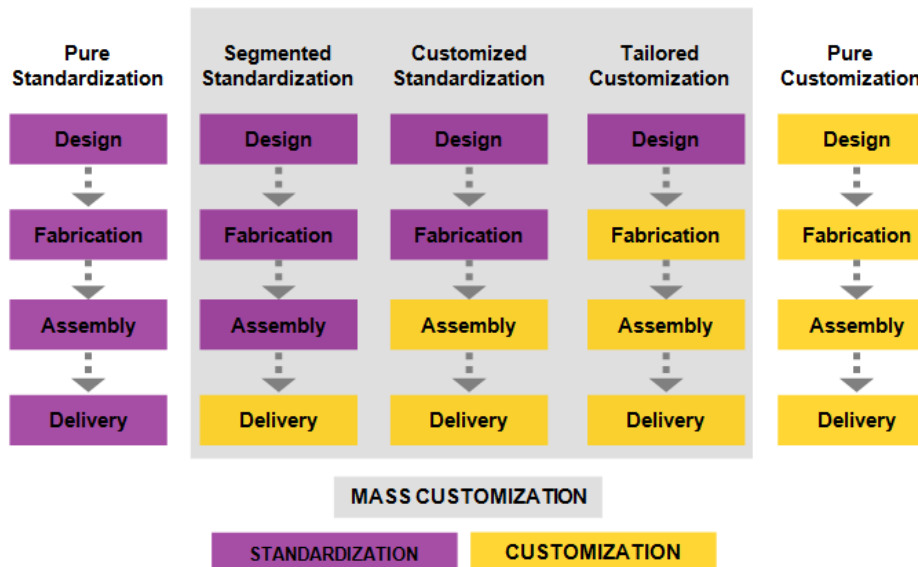


Figure 1: Mass customization strategies with regard to level of customer involvement (source: Tseng, 2003).

STATE- OF- THE ART REVIEW: MASS CUSTOMIZATION OF HOUSING

There are two main reviewed categories to group the literature: industry applications and literature related to academic research.

(i) Industry Applications: The international housing industry has shown growing interest in implementing mass customization as a delivery strategy (Timberlake, 2004). Japanese housing manufacturers, who are considered world leaders in industrialized housing, have been developing high-tech approaches since the mid 1980s when companies started investing heavily in improving design flexibility to customize housing to buyers' choice. The outcome was companies to employ cutting edge computerized design and inventory control systems, automated assembly-line production as well as advanced research and development. This shifted production from a repetitive mass-produced mode, to a mass customized system offering a wide variety of housing components for users to select from. Companies have succeeded in producing custom homes of remarkable quality by adopting systems based mainly on standardization of components, features, materials, and processes and inviting clients to participate in the design stage of their homes

Additionally, Japanese prefabricators have integrated specially developed marketing, design, and quality- oriented production techniques with the aim of satisfying local demand. Customization is delivered through managing the entire production process; balancing use of standard components with flexibility in assembly (Grann, 1996). Companies employ CAD systems to realize conceptual image to certain dimensions in the design stage, while CAM systems transfer drawings into manufacturing steps that include technical planning, production scheduling, and automation control.

In a different approach, some of the companies operating in the North American, such as LivingHomes and PostGreen Homes , have managed to develop an interactive, web-based interfaces that engage customers in the design of their homes through a sequence of decision making process leading to customization. Homebuyers would start the process by creating an account, selecting a housing model that suits their needs from a variety of models, and then proceeding with the modifications of their chosen unit. Additionally, a decision support system is embedded in the search process, providing customers with various details of finishing materials and systems. Any modification made to the base unit, is reflected in the price of that dwelling. At the end of the process, the customer gets a detailed analysis of the modifications and their final cost. These companies usually depend on standardization of components with different assembly options.

(i) Academic research : Larson, Tapia, and Duarte (2001) defined three main necessary elements for implementing mass customization of housing:

- 1- *Preference engine*: a framework to engage the customer in a dialogue to build profile.
- 2- *Design engine*: a computational system that encodes data collected by preference engine, into an architectural design to be evaluated by the user. The system will then follow up with the generation of more solutions. It is important to study how these solutions may become affordable when linked to integrated, component based, Computer Numerical Control (CNC) fabrication techniques.

3- Production system: a digitally controlled production system that can extract geometric and other information from the digital design model.

Duarte (2001) proposed a comprehensive model for mass customization based on implementation of a design system into an interactive computer program that would generate housing designs through a given language. The design system used description and shape grammars as a technical device for encoding design rules. The model was demonstrated through implementation developed for the Malagueira housing project by Alvaro Siza. Such system requires developing a grammar, then encoding it into a computer system, which is considered to be time consuming. See also Duarte (2005).

Juan et al. (2006) developed a hybrid model that employs Case Base Reasoning (CBR) and Genetic Algorithm (GA), in an attempt to bridge the gap between customers and builders in the communication stage, the paper. The system first uses CBR technology to retrieve satisfactory housing layouts based on customers' needs, and then GA is applied to search for satisfactory solutions for housing customization options by optimizing cost and housing conditions. The model demonstrates high potential in deploying information technology for user participation and customization in the housing industry.

Duarte (2008) proposed a model that includes a design system that encodes the rules for generating customized designs and a prefab building system that makes it possible to construct from such a design. A computer system was implemented to enable the easy exploration and visualization of solutions, and automatically generates the information required for production. Rules of both design and construction were systemized, and then encoded into the computer program, which operates in three stages. the proposed framework opens new opportunities as it remarkably established a link between the design system and the building system.

In an interesting direction, Beetz et al. (2010) proposed a method to allow homebuyers customize their homes, restricted by a set of constraints representing building regulations, architect, and user requirements. Constraints are presented as internal functions that take a building model as an input and return a Boolean value (true or false) indicating whether the constraints are violated or not.

The need for customization, along with development of digital design and production techniques stimulated remarkable interest in its application in the realm of housing. However, there are still open opportunities regarding exploring design of design systems. For other approaches to the mass customization of housing, there are the work of Saas (2007), Nogushi (2004,2008), etc..

A DESIGN SYSTEM FOR MASS CUSTOMIZATION

The process of housing design can offers a great range of variations, but at the same time it is subjected to many regulations controlled by homebuyers' profile, needs and requirements, site and building guidelines, and contextual constrains. In that sense, it is infeasible to consider all these parameters through predesigned prototypes. The rational solution is to offer future homebuyers products that are tailored to their wishes by getting them involved in the design process at the earliest stage possible.

The application of generative design models towards customizing housing has been explored with the aim of bridging the gap between homebuyers, architects, and builders. In other words, because it is almost impossible that the architect will meet with all future homebuyers to design custom homes, then implementing a computer-based generative system can be considered as an appropriate solution. Such design system will be an outcome of collaboration between the architect, and builder, thus based on design and production rules. However, prior to designing a design system, it is crucial to determine the level of customer involvement in the customization process, which determines the customization strategy to be implemented, thus the nature of the design system.

According to critically analyzing diverse approaches to implement mass customization in the housing industry, the following framework for the design of design system was derived and structured.

1. *Define the design problem:* the definition of the design problem is primarily based on:

- a. The nature of the problem: according to Mitchell (1974), a problem is specified by giving description of the required object.
- b. Problem statement, including various conditions that must be met, tools and operations that are available to be employed, and limits on resources.
- c. Goals to be achieved
- d. Appropriateness of the problem for being solved through computation methods.
- e. Integration scheme; the interface through which homebuyers/architect will be able to manipulate the proposed design of their homes.

2. *Structure collected information:* it is important to structure all the collected information hieratically in order to formalize a design brief that would help developing the design system. This concept of structuring information was proposed in Alexander's seminal book *Notes on the Synthesis of Form*, where a list of statements was written to be considered by the designer.

3. *Define set of variables and parameters:* variables, in addition to mathematical equations, are used to translate a design brief and represent it in terms of shapes and spatial relations, thus produce a solution that responds to users' desire. Variables encode user preferences into numeric data required for the design. The number of variables and its influence in the design process has a direct impact on selection of generative tool.

4. *Define set of constraints:* the outcome of systematically structuring gathered data is a set of constraints that control the nature of the desired outcome of the design problem. Constraints help directing the search process towards the suitable candidates by providing checkpoints. Each constraint is a definite statement of characteristic that the solution has to comply. Constraints can be grouped into larger classes, each related to a precise feature of the project.

Set of constraints will usually include:

- a. Design rules
- b. Functional requirements

- c. Spatial proportions , adjacency, and orientation
- d. Building codes and regulations
- e. Environmental consideration
- f. Additional constraints may be added according to construction system. For example, if designing for a prefabricated housing system, then module sizes, transportation, dimensions, and connection regulations can be regarded as constraints.

5. *Select appropriate generative model*: the study of applicable computer-based generative design tools towards mass customization of housing has demonstrated promising possibilities. However, because it requires managing enormous amount of information, the issue of covering all aspect of the process has always been questionable. Precedent research demonstrated the application of the following generative tools:

- a. Shape Grammars: it is classified as rule-based formalism that facilitates the process of generating design through structuring, then applying a set of rules. However, implementing such system on the computer is time-consuming because it requires defining shapes and rules, then encoding them (Stiny, 1972).
- b. Evolutionary systems: considered as highly creative, and can be employed in through various phases of architectural design. Its performance could be enhanced when introducing constraints to the generation process. Formalizing an evolutionary generative system requires considerable computing expertise. The discourse about how to encode forms and manipulate the resulting data is more philosophical in nature, compared to technical (Frazer, 1995).
- c. Parametric systems: classified as a specific case of algorithmic systems. They were developed to handle variations within various design and production environments. They are based on the notion of associativity, where object properties branch from relationships or inheritance. However, parameterization increases the complexity of both designer task and interface, as designers have to model the structure through which variation is controlled, in addition to the artifact being designed (McCormack, 2004).
- d. Constraint based systems: Design by constraints has gained notable interest lately due to its ability to direct the design process towards desired solutions, by being able to managing a large complicated set of relationships (Kalay, 2004).
- e. Hybrid systems: The real power of generative tools lies behind the combination of two or more tools. Various hybrids have been proposed, such as combining shape grammars with evolutionary algorithms, and parametrics with other rule-based systems. In other words, it involves combining the power of knowledge-based systems, with rule-based systems, or even the power of two rule-based systems.

Constructing a generative tool is considered as complex process, as it involves a discrete design within the design system. Each of the mentioned algorithms can be constructed in various methods based on the nature of the problem and the desired outcome.

6. *Implementation*: computation involves processing information in mathematical terms, it is required to describe spaces and spatial relationships in terms of

numerical values. There are various software platforms that enable encoding design knowledge and rules and produce high visualization. The selection of the platform relates to the nature of the link between design and production. Recent developments of parametric and Building Information Modeling (BIM) software have opened new opportunities towards linking design and fabrication. Parametric modeling creates the mean by which architects, engineers, planners, builders and fabricators can communicate in a fully integrated environment. BIM contains all the information required for the development of fabrication, and assembly of the house. The outcome of such systems is more efficient structural and technical coordination, better management of parts schedules of procurement, an understandable approach to sequence of assembly, and greater control over fabrication, assembly, and building components.

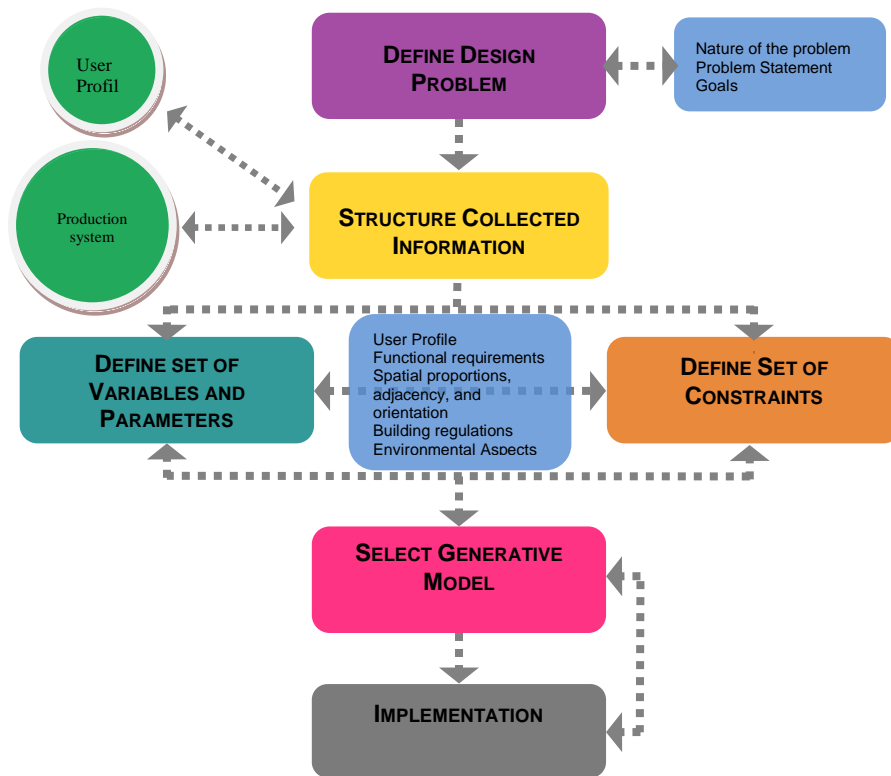


Figure 2: Graphical Presentation of the framework.

CONCLUSION

The common application of customization within the housing industry is to provide homebuyers different alternatives regarding layout, finishing and systems alternatives. For example, the homebuyer will be offered to choose between housing layout A, B, or C, then kitchen layout A, B, or C, an optional extra garage or even extra story. This approach has been defined in research as “multiple choice housing”, which takes the form of printed and electronic catalogues. Electronic catalogues; typically, take the form of

internet websites, offering users the ability to navigate then modify the design. Such trend is considered to be exhaustive, as the architect is required to formerly design all possible alternatives. As a result, in some cases the amount of alternatives has to be kept limited to three to four options in order to avoid additional overhead cost. Moreover, offering many choices might be confusing to some homebuyers. Nevertheless, there are still chances that customers' desired design variation will not be offered, since alternatives are developed according to architect's view, not the customer's demand.

Mass customization of housing is considered as a remarkably complex process, as it requires orchestrating the relation between homebuyer, architect, and builder. The development of computational techniques in the form of generative models demonstrated great potential towards integrating homebuyer's needs and requirements in the early stage of design; layout design. However, the process provokes many questions concerning its efficiency and applicability. Designing, thus implementing a generative model for mass customization of housing depends mainly on the business model. In other words, housing typology, design and production technology, and marketing strategy. This dictates the level of customer intervention in the design process.

A design system for customizing housing requires the input of homebuyers profile, socio-cultural background, building context, budget, and required spaces and activities, all to be accommodated into a set of precise spatial requirements that would structure a design brief for a specific case. At the same time, the system also depends on the ability of the building method to accommodate variations. This type of data has a direct impact on the problem definition.

This paper proposes a framework that can be pursued when designing a design system to customize housing at the level of layout design. The proposed framework is generic, and flexible for further developments. It raises various issues regarding the applicability of generative models to customize housing. First, the model by which clients would interact with the design system. Second, required type of data output to efficiently link design and production. Third, the appropriate process to customize the components of the house. Finally, the possibilities of implementing the described method for customizing multi-family housing. Future work will be concerned validating the framework through two cases studies.

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Innovating, Housing, Learning

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Paper:

Web platform to promote “Housing as a Process”

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OIKODOMOS is a Virtual Campus co-financed by the Long Life Learning Programme of the European Union to support housing studies in Europe. In the first two years of the project, 2007-2009, OIKODOMOS has developed, implemented, tested and evaluated an innovative pedagogic model based on a blended learning approach which combines on-line learning activities carried out in web-based environments -specifically designed for this Virtual Campus- with seminars, design studios and workshops physically taking place at the participating universities. The goal of the third year project activities (2010-2011), is to consolidate the pedagogic model, to expand the Virtual Campus to other institutions and to disseminate the project results among the academic and scientific communities.

COMMUNICATION

Web platform to promote “Housing as a process”

casamasomenos.net

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0. Presentation and housing activities by lapanadería.
1. Research centered on the concept of housing as a process.
2. Teaching work. Workshop production.
3. Proposal of a web-platform to promote housing as a process.

0. Presentation

Lapanadería was founded in 2003. Since 2005 contemporary housing has been a key issue in their research programme “**+ or – (more or less) House, housing as a process.**” The ideas they have worked on have materialized in particular building experiences, specific projects for research courses and theoretical reflections for the academic world (Conferences for master's degrees and post-graduate courses) The aim is to bring together as part of the critical reflection the project in process and the ideas that are put into practice. Eva Morales and Ruben Alonso Mallén are professors from the Faculty of Architecture in Málaga University, which allows them to work on these issues within the academic environment. The aim of lapanadería is to develop the professional study combining practical work, research and teaching, three disciplines that complement each other.

One of lapanadería's main targets is to set up a web platform that has a role in changing **the processes of “Access to a house”, and “Uses of a House”**, where the user/dweller can and must be an active agent.



1. Research centered on the concept of housing as a process.

“+ or – House, Housing as a process” (2010) is a research project carried out thanks to the Subsidy for Research Activities on Architecture and Housing Matters, granted by the Department of Public Works and Planning.

The main objective is to highlight **housing as a process, opposed to the dominant concept where the house is a “finished” object**. This project hopes to solve certain gaps in the current housing model in Spain.

The duality of considering a house as a process and as an object, shows the two main, and opposing ways of conceiving a home:

On the one hand, the most common approach considers the house as a finished object, it is seen as merchandise and not as a basic right nor a public good. From this point of view it is not a flexible object because it doesn't account for a family's natural changes, nor the alterations in their living spaces, nor the evolution of these changes through time. This model delivers an object that doesn't satisfy its basic function, to provide habitability, it is designed for a stereotype user, a neutral, abstract, male, and generally middle class, consumer. It is an object that due to its lack of flexibility and its detachment from reality (it only meets the market's demands) it wastes a great number of resources (natural, economic and social ones) and produces an enormous quantity of waste.

On the other hand, to consider housing as a process **means to widen the dimension of the house, extending it beyond its physical barriers** to the permanent act of building and dwelling which takes place in time and not just at a particular moment. The house cannot be reduced to a closed space, it extends to the urban environment of which it is part. In the same manner, the right to a house doesn't just mean access to four walls and a roof, it really means the right to a community.

To consider the house as a process doesn't just mean focusing on the time dimension, the unfinished process of building a house, it implies the **need to incorporate the dweller/user in this process**. It is about understanding housing as an open process where ways of collaborating and working together are recouped and updated by technicians and the dweller/user.

To consider **housing as a process also means to provide it with the capacity to adapt and be flexible**, so it can deliver the habitability that is really demanded by society, by the diversity of ways of life, the different structures of coexistence and their ever changing needs. But this habitability must be stated by the citizens, by their needs and demands, and not by some spatial guidelines set by regulations and the housing market.

This adaptability of housing as a process also allows **the creation of habitability** not only from the production of new homes, but above all from the recycling and the use of existing spaces. This guarantees that the supply of habitability also depends on the availability of resources and the limits on waste production.

To make the house meet not only the needs, but also the potentials of its users, all the agents must be involved in the process; this will change the classic roles of power: now the user can express his needs and requirements, right from the planning stage through to the whole useful life of the house.



Housing Strategies

The “+ or - House” research has focused on identifying *housing strategies* which allow or encourage housing as a process. Behind the housing strategies concept there are various means and mechanisms that enable housing as a process. Due to the many aspects to be considered, in order to make them more accessible, despite the fact that they are interrelated, three important levels of work have been defined: the space/typology level, the social/participatory level and the organizing and management level.

Space/typology level

The study of spatial and typological transformations, which make the house flexible, has two different aspects:

- Typological models of houses in process.
A proposal of typological models of houses in process points out the most representative cases of flexible housing. The selected typological methods are: Perfectible housing, loft housing, de-hierarchical housing, transformable housing, recipient structure housing, expandable housing, expandable by units housing, shell housing, seed housing, scattered housing, dividible housing, and others yet to be discovered...
- Flexibility strategies
On the other hand, strategies to make the house more flexible, the main feature of housing as a process, are studied on a theoretical level. To break down the different strategies will enable us to study aspects such as its viability under current regulations, basic requirements to apply these strategies, the difficulties of applying the strategies, etc.

The three main proposed categories of flexibility strategies are:

- **Qualitative strategies** introduce a qualitative change as an answer to a demand from the user wanting to personalize or technically adapt his house.
- **Adaptable strategies** are those that enable spaces to change functions, meeting the users demand for a functional adaptation of the house. The change of function is achieved directly through the **change of use**, because the spatial design allows it, or because a **spatial change** takes place.
- **Elastic strategies** change the size of the house so it adapts to the functional demands of its user.

Social/Participatory Level

In the concept of housing as a process **spaces must be able to adapt to social and environmental needs, and also to the available resources**. This is why **the users participation** is essential to define their individual and social identity. Under this guideline we understand that the participatory processes contribute to a project that is socially sustainable, where groups and individuals share and redefine their housing needs in a dynamic relationship where “they learn from their own experience”.

The users’ participation making decisions about the management, design, construction and development of the house during its useful life is essential to understand housing in a broader way, as an open and flexible process, related to the habitat that it is part of, with different social groups, with different lifestyles, objectives, needs and possibilities.

Following this guideline an analysis and selection of participative methodologies working in the urban environment has been carried out, looking at projects such as PAR

(Participatory Action Research) or EASW (European Awareness Scenario Workshops). Furthermore, a series of methodologies with a collaborative design have been identified and selected, tools that enable the user to work on the design of his house. Some of the selected methodologies are: Barcode Housing System, Design from Generated Options, Pattern Language, Housewriter, Support Method, Livingstone Method, House Generating Programme, etc....

The aim of this selection is to offer professionals, users, public administrations and anybody who is interested, the tools to participate and the access to previous experiences put into practice, and they are for everybody not only to the specialists in the field.

Organization and Management Level

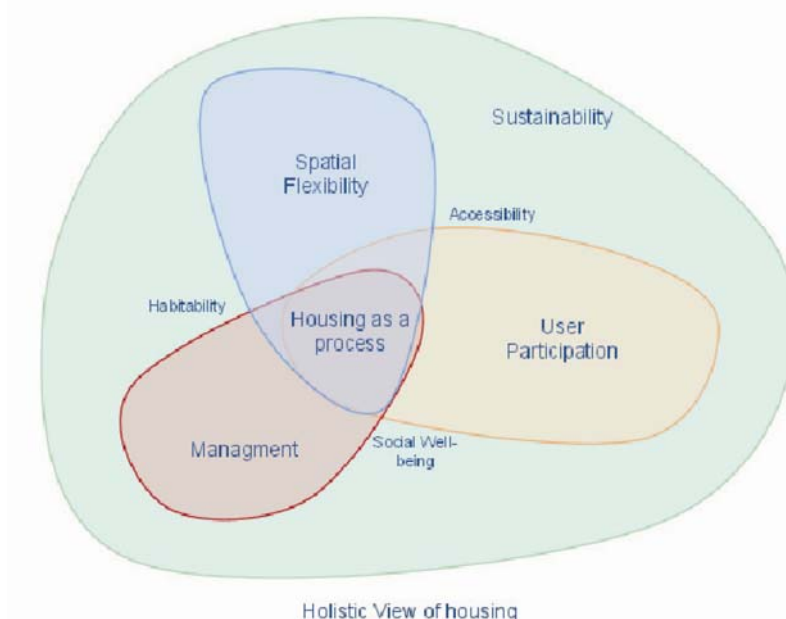
Management is a key issue producing and using a house, and therefore, to understand housing as a process. The agents that take part in the house management, the stages in which it takes place and the kind of ownership it has, will determine different kinds of management, whether it is a current model or one that will develop in the future.

The dominant model of private ownership and management of a house places us further away from the basic right that we all have to a dignified home, as it says in article 47 of the Spanish Constitution. There are other management models that bring closer the needs and potentials of the present day users. There are other management models where the user/dweller participates in the shaping of his home, whether it is the project, the building stage or the useful life of the house. However, every transformation in the house proposed as a process, implies the management of that transformation, whether it is done by the dweller, the community or an outside company.

In this research a number of housing organization and management models are proposed, they enable it to come closer to the needs and present day potentials of its users when they access the house and during the useful life of it.

To do this, an analysis is carried out of the different kinds of management: public, private, self-run, together with the different stages in which the user can get involved: promotion, production and user/dweller.

Some of the selected experiences are: Urban Sharecropping, Autoconstruction, Cooperatives, Cohousing, Squatting, Zwischennutzung or Intermediate use, etc...



Selection of previous experiences

A selection of previous experiences concerning housing or a group of houses has been gathered so that they can be used as a reference for each of the levels mentioned above. The aim is that the experiences illustrate or prove the viability of some strategies in a particular context and to simplify their implementation and improve their adaptability to other contexts. It hopes to be, as a catalogue of experiences, a useful tool for any person, collective or organization.

By way of conclusions it is convenient to comment that the selection of methodologies and experiences is currently “under construction”. In the future web-platform, this selection will be updated with the participation of other professionals and housing users, so a collective network of agents and experiences can be set up for the improvement of housing understood as a process.

2. Teaching Work. University workshops.

As part of the research, university workshops have been carried out in the Universities of Málaga and Sevilla. The workshops are set up as multidirectional laboratories where both the teachers and the participants take part in a continuous exchange of ideas, experiences, reflections and proposals. The results of the workshops will become part of the experiences compiled for “The House as a Process”.

Participants from the workshops are asked to observe, reflect, criticize and propose about housing and how it adapts to present day ways of life. We want to re-think housing, to consider it not so much a physical object to build but a time-space process that adopts different configurations in time and needs the participation of its dweller during this process. This is why we want to work with the participants as dwellers on the one hand, and on the other, as students, future technicians or partners in this process, which we understand must be carried out with the different agents involved.

A series of exercises have been carried out, each participant has watched the evolution of his or her own everyday life, and the use he or she makes of the spaces they inhabit. They have done this first from an individual and particular point of view, then from the perspective of the community, reconsidering what is shared and what not, and how it is done. By doing this they can assess what repercussions they have on these spaces and what kind of arrangements are generated.



3. Proposal of a web-platform for citizen advice and the promotion of housing as a process.

After this research, carried out in the Andalusian territory, we are currently developing an online platform that we hope will become a useful tool for technicians and citizens, it creates new networks and it encourages self-run processes of collective housing. This is how a network is generated, developing collective knowledge, increasing the citizen's access to it and that of the agents involved in the production and management of housing in our territory. The web-platform

expects to become a useful tool for technicians and citizens that will enable the generation of new networks and ways of communication.

The platform will organize, digitalize and give access to all this information on a support basis that is editable by the technicians and the users, enabling the debate and promotion of these contents. It also pursues the establishment of networks in the context mentioned earlier and the setting up of international connections to share experiences and knowledge.

The *www.casamasomenos.net* platform will be developed with funding from the Ministerio de Cultura (Culture Department) from September to March 2012.

The targets of the platform are:

The collective creation of a vast documentary database that will contain the theoretical base that supports previous and future practical works, together with all kind of information and resources related to housing as a process. It will be free to access and extendable.

The creation of a catalogue of experiences where the user's participation has been encouraged during the management, design, construction or maintenance stages. **It illustrates and proves that alternatives to housing as merchandise are feasible and desirable.** It will also enable the comparison of similar projects in different contexts, encouraging debate and seeking the best answers.

To turn into an international reference when it comes to finding information and agents concerning housing as a process.

Creating the "More or Less House" community, who on a medium/long term will be responsible for the development of the web-platform. It will enable the creation of synergies among people/collectives who work with the same interests.

To advise collectives and individuals about alternative housing models. Within this area we hope to explore new forms such as an **online consultancy run by the community using the contents** of the web-platform.

To be a collaboration and discussion tool about issues related to housing as a process.

To promote new ideas and projects on a national and international scale, especially collective projects and strategies that encourage the users' participation in the housing process.

To enable the creation of new collectives, using the platform as a meeting point for users who demand a house. It will encourage the communication and setting up of co-operatives.



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Paper:

**Emergent design for humanized housing:
towards a parametric-typological design tool**

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EMERGENT DESIGN FOR HUMANIZED LIVING

TOWARDS A PARAMETRIC-TYPEOLOGICAL DESIGN TOOL

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Resume: This paper presents the preliminary research results of a group of four master students who proposed to develop a grammar of ready-made housing for humanized living based on three informal settlement case studies.

Keywords: emergent housing; shape grammars; CPLP

Introduction

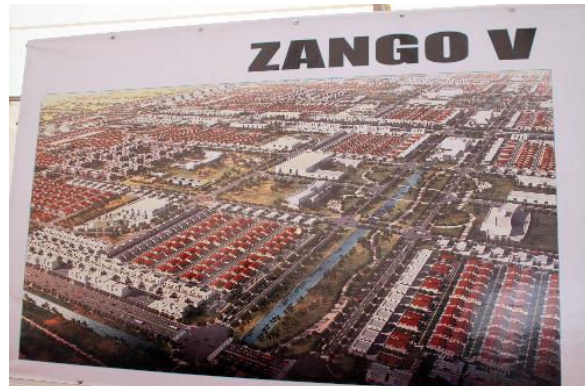
“(…) emergence refers in fact to a very particular scientific phenomenon: the indivisibility and irreversibility of wholes - be they structures, organizations, behaviors, or properties. In particular, emergence refers to the universal way in which small parts of systems, driven by very simple behaviors, will tend toward coherent organizations with their own distinctly different behaviors.”(Wiscombe, 2005, pp. 2)

The right to adequate housing is recognized as a fundamental right by the United Nations (UN, 1948). However, the current situation does not allow the achievement of adequate shelter for all (UN-Habitat II, 1997). Informal settlements and self-built housing arise as survival mechanisms to answer for the housing deficit and as a consequence of the rural exodus that happens in all major cities in the world (fig. 1). The governments of the Portuguese-speaking countries of Africa and

Latin America have sought to address the housing needs by launching mass housing programs. Angola has launched the National Housing Construction Program (*Programa Nacional de Construção Habitacional*, PNCH) and Brazil the program My Home, My Life (*Minha Casa, Minha Vida*) (fig.1).



(1)



(2)



(3)



(4)

Fig.1. Diversity to repetition. (1) *Mussequê Marçal*, Luanda, Angola; (2) Mass housing program in Angola; (3) *Favelas Complexo do Alemão*, Rio de Janeiro, Brazil; (4) Program *Minha Casa Minha Vida*, Brazil. From: Google Earth and Internet.

Nevertheless, in general, the low-income housing solutions produced to reformulate the informal cities, are inadequate to the cultural, social and economic conditions of their inhabitants (Coelho, 2010; Paio *et al*, 2011). The solutions are based on uniform repetitions of pre-defined plans for houses that fit neither familiar nor cultural needs. Fortunately, nowadays new questions are being asked: Who will decide how essential housing life needs are to be fulfilled? The governments or the inhabitants themselves? Who decides? The improvement of current low-income housing models is essential to rise to this challenge. The complexity of these issues and the environment of economic constraint call for different approaches. According to Erguden (2001, pp.1) “*design of dwellings and neighbourhoods [have to] reflect and protect important elements of values and culture*”. Along with these assumptions, there are reasons to consider that diversity and adaptability yield a better match between the building environment and the life it shelters (Habraken, 1987). Variety is an indispensable requisite for freedom and authentic culture and without them, people’s needs cannot be satisfied (Turner, 1976). As Gonzáles and Donath (2003, pp. 2) put it the “*user-design and self-built housing strategies correspond to non-paternalistic support methods that are not only capable to provide more diversity of dwellings than conventional mass housing programs, but also a bigger sense of appropriation and identification of the dweller with their own habitat*”. Specific social-cultural aspects play an important part in the preference shown by families in building their own homes (Kowaltowski *et al*, 2005), creating a typological affinity (Aguar, 2011).

The self-built housing in informal cities has humanized logics that should be revealed. It is important that housing patterns and the social and cultural genesis of their structure and configuration are shown, systematized and used in the new housing designs. To apply such ideas, a better understanding of the context of informal settlements and self-built housing is necessary.

The research described in this paper is part of a larger on-going project called “Emerg.cities4all”. The project main goal is to develop a generative computer-aided planning system for low-income housing populations. This paper describes the results of a group of four master students who were proposed to develop a grammar for the ready-made housing for humanized living. The goal has been to reveal the cultural, social and spatial dynamics involved in the genesis of informal settlements and use it to generate contemporary humanized modular, scalable, adaptable and affordable ready-made housing design solutions based on a descriptive method as the Shape Grammars (SG) (Stiny and Gips, 1972). SG allow a computational approach to the generation of designs solutions (Stiny, 1980). Grammar formalisms deals with an algorithmic process of design. Over the past decades, SG have been a powerful means of analysing and generating housing designs (Duarte, 2001).

This paper has three sections. The first section describes the preliminary conclusion of the analysis of the three informal settlement case studies. In the next section, the ready-made housing for humanized living grammar is explained. The final section sets some conclusions and future work.

Case Study Analysis

In order to analyse the rules of the self-built housing in informal settlements, three case studies were defined: (1) *Complexo do Alemão*, Rio de Janeiro, Brazil; (2) Airport neighbourhood, Maputo, Mozambique; and (3) *Marçal*, Luanda, Angola. The bottom-up approach allows a manner of controlling the design, based on the dependent behaviour of its parts (Paio *et al*, 2011). In this approach, larger scale problems can be answered by answering the small-scale ones (Duarte, 2007).

These analyses allow us to define some preliminary conclusions from their lifestyle and architectural processes for the development of a grammar: (1) Rooms inside dwellings are contiguous, leaving no space for circulation areas; (2) Rooms have minimum areas and as a consequence, maximum segmentation, leaving no surplus space; (3) Dwellings grow by the means of their family necessities, for example, household changing number; (4) Inhabitants value the exterior space, spending more time outside than inside their homes, generating greater experiences of community living, exploring the soil for subsistent farming or even washing and drying their clothes; (5) In urban scale, the overcrowding of these complexes require a nearly complete occupation of the exterior space inside blocks, leading to disputes and resulting, in most cases, in constant narrowing of the pedestrian accesses; and (6) Only spaces with specific exterior functions, as referred to in point 4, are left open inside these blocks. (7) It should be highlighted that the void, despite being a space resulting from the construction, is very important as it assumes the cultural and social patterns of the analysed study cases. In informal settlements, people seem to know very well the places to promote the collective areas.

The fundamental needs of the people are not measured by arrangements of architecture components (rooms, walls, doors, ...) but by the degree of accessibility (that people have to friends and family to their sources of income). According to Balestra (2009, pp. 85) the house “*meet the needs of the family in terms of size and their lifestyle*”.

From the analysis of the case study, the question emerges of cultural patterns and inhabitation forms that result from the daily living of a specific family or in a bigger scale of a specific community. Having in account the size and the type of the family group, this becomes the main element that defines the house. Once the elements that constitute the house were defined, the

relationship between them was established. This research proposes a creation of dwellings that may be adapted to the family needs (fig. 2).

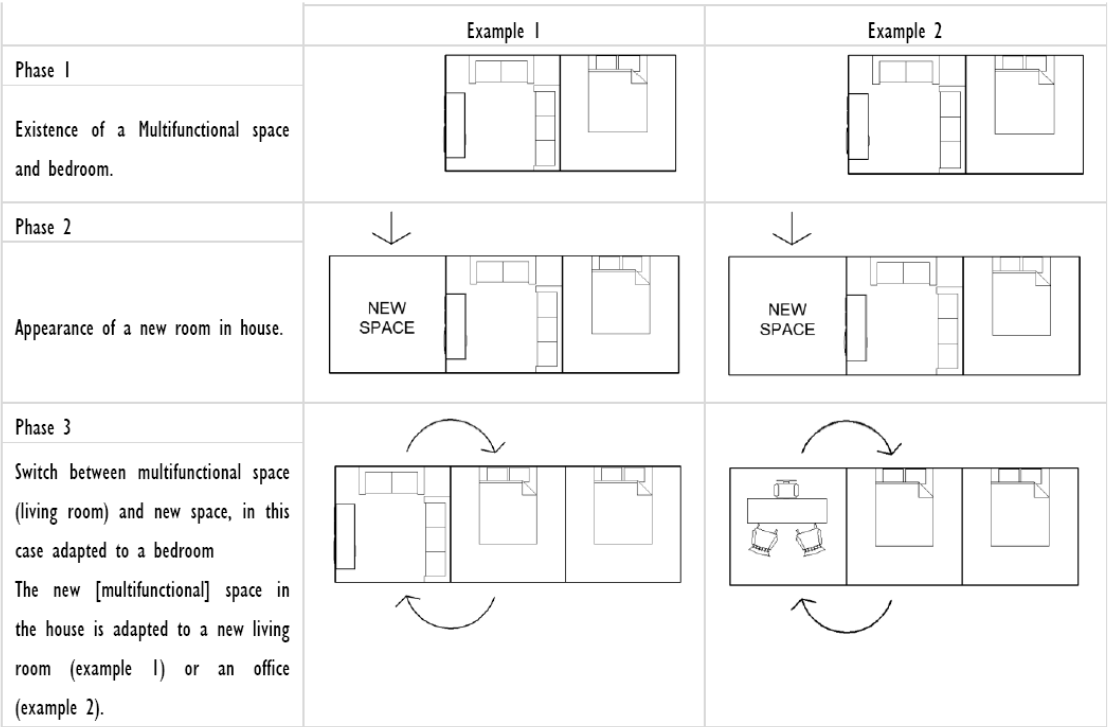


Fig. 2.Two examples of the evolution and adaptation of the room.

Preliminary Grammar

The proposed ready-made housing for humanized living grammar is a bi-dimensional parametric shape grammar with tree types of rules: fixed rules, adaptive rules and evolutive rules. The rules shape the relations between the created spaces using a description grammar (Stiny, 1981).A description grammar “describes the design in terms of other features considered relevant according to some criteria of interest. The relation between shape grammars and description grammars is such that for each shape rule there is a corresponding description rule. As the grammar rules are applied to the evolving design, the corresponding description rules are applied to the evolving description” (Heitor et al, 2004, pp. 493).A grammar consists of a set of rules that apply recursively to an initial form produces a final design (Duarte, 2001).

Using shape grammar, our primary goal is to create a house that grows with the tenant family and adapts to its needs without compromising local lifestyle and culture. This system will therefore lead us to the generation of innumeros solutions, dwellings able to simulate the diversity and complexity of real urban clusters. This way, and according to the analysis done of the case study, these dwellings were thought for general situations, where household consists, of at least, 1 element, to 12 elements (maximum) (fig. 3).

Due to length restrictions, it will not be possible to describe in detail all rules of the proposed grammar. But, in order to demonstrate the grammar developed so far, two examples of a derivation process is illustrated and described: (1) variation of a dwelling for a household with 3-4 people; variation of a dwelling for a household with 7-8 people (fig. 5).

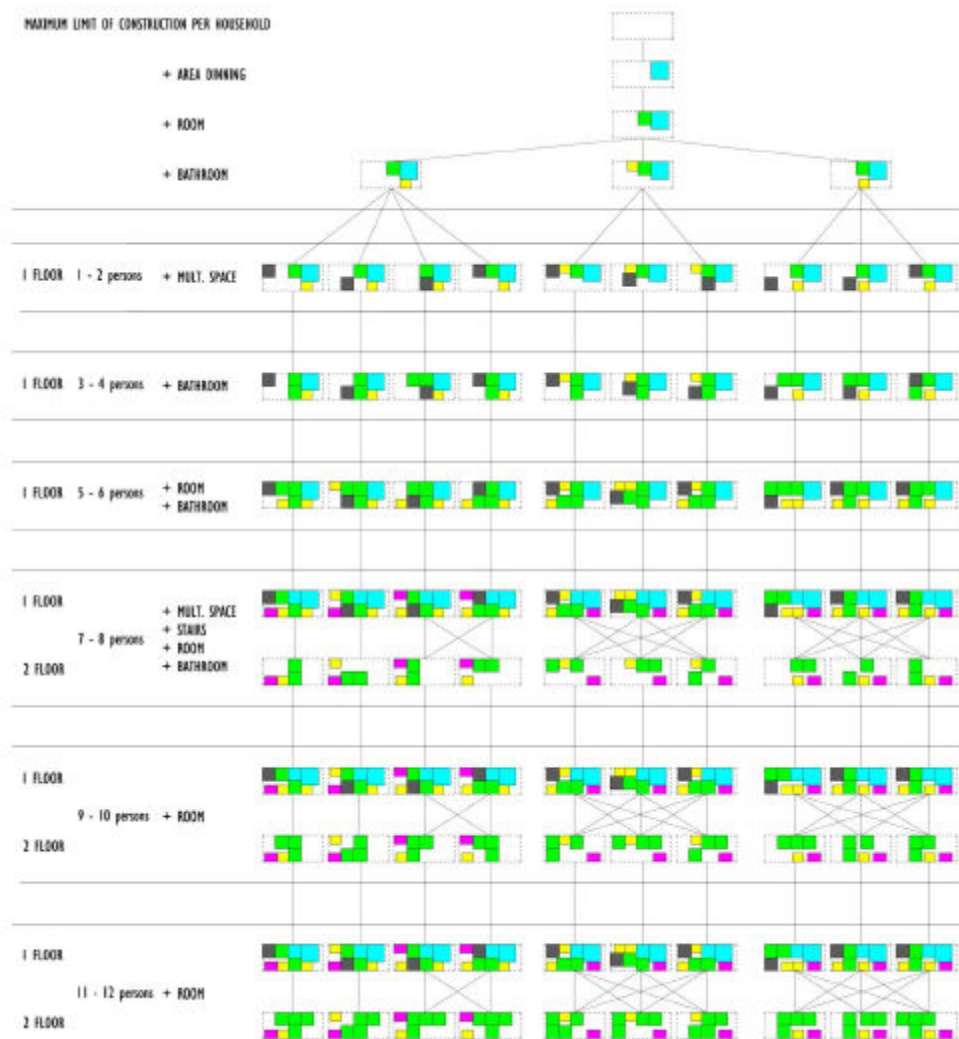


Fig. 3. Tree diagram to illustrate the derivation of some modular, adaptable and evolvable ready-made housing for humanized living.

The three initial steps of the generative process are identical. The initial shape corresponds to the maximum limit of construction per household (LMT) (6 x 14 meters) (fig. 4). The first element to emerge in the house is the dining area (D.A.) characterized for being the space where the family meets for their daily meals (rule 1). Related to this space, emerges the bedroom (BDR) (3 x 3 meters) where one or two people can fit, according to a generic distribution, although it could, in exceptional cases, take three to four people (rule 2.1) (fig. 4). The bathroom (BTH) is the space that follows (fig.5). After, comes the multifunctional space (M.S.) that could assume one of the following functions: office, commercial space, living room or storage space or according to an adaptive rule, the space could be changed into a bedroom (fig.3 and fig. 5).

The elements that constitute the space are consequence of the application of the fixed, adaptive and evolutive rules according to the number of inhabitants and the number of floors. From 7 to 8 people in the house, a new floor is created, and together with this, space for the stairs, which appear in the limits of the construction extremities. In the two floor house, even more combinations appear, with the 1st floor keeping its shape and the 2nd floor possibly changing (fig. 3 and fig. 5).

The generative process includes the urban scale. Figure 6 represents just a possibility of urban cluster. The example is constituted of several dwellings in different phases of occupation, showing relations with the urban space. Together they generate a spatial form with exterior spaces in different layers: public space; semi-public and private space.

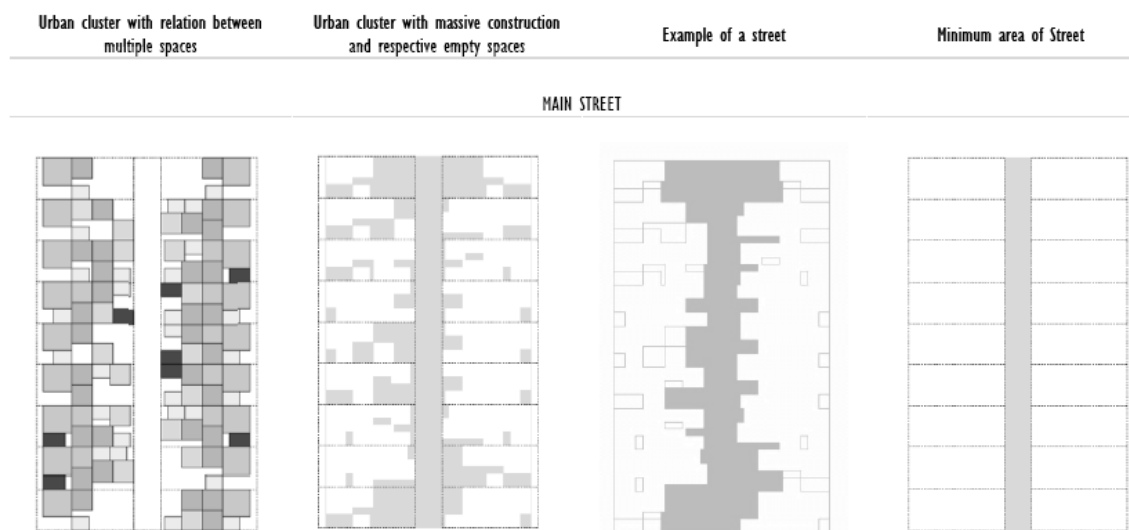


Fig. 6. Example of urban clusters

Conclusion and future work

One of the most important conclusions of this research is that we cannot impose our own habits and processes to these communities. They have their own quotidian life styles and habits, meaning that for creating this specific architecture we needed to learn with them. On the other hand, this new design tool can deal with complex issues such as self-evolution, self-adaptation and formal diversity on architecture and urban design.

Our work will continue, studying the way these dwellings interact, creating spatial relationships, patios, squares, streets, blocks and even new city tissue. A new kind of ready-made architecture will rise from this computational process and also better and cheaper constructive methods and materials experimenting with CAD-CAM precision.

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Innovating, Housing, Learning

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Paper:

**Reflection of the multimedial design in the innovative development of
housing structures**

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OIKODOMOS is a Virtual Campus co-financed by the Long Life Learning Programme of the European Union to support housing studies in Europe. In the first two years of the project, 2007-2009, OIKODOMOS has developed, implemented, tested and evaluated an innovative pedagogic model based on a blended learning approach which combines on-line learning activities carried out in web-based environments -specifically designed for this Virtual Campus- with seminars, design studios and workshops physically taking place at the participating universities. The goal of the third year project activities (2010-2011), is to consolidate the pedagogic model, to expand the Virtual Campus to other institutions and to disseminate the project results among the academic and scientific communities.

REFLECTION OF THE MULTIMEDIAL DESIGN IN THE INNOVATIVE DEVELOPMENT OF HOUSING STRUCTURES

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Abstract

Contribution introduces the tools of multi-medial design, which were used for the enhancement of the design quality and efectivity of the town structures and masses. It s possible to use them for architectural design too. The paper is introducing how to use open source online tools for architectural and urban design. The objective is to increase the quality, functionality and aesthetical value of created design.

With adequate ICT tools we can receive these objectives faster and with more objectivity. The design process can be adjusted as working on-line. Such innovative housing design is more readable for citizens and inhabitants. Presentation of 3D models online placed in real surrounding brings more realistic view on the designed structures. The modern multi-medial tools can involve the participation of different actors in the design process and bring more objectivity to design process.

For this purposes we can also use augmented reality - live direct or an indirect view of a physical, real-world environment whose elements are *augmented* by computer-generated sensory input such as sound, video, graphics or GPS data. It is related to a more general concept called mediated reality, in which a view of reality is modified (possibly even diminished rather than augmented) by a computer. As a result, the technology functions we can see contrast, virtual reality replaces the real world with a simulated one.

Methodics for the design of the interactive digital environment for town planning and public participation

Computer aided environment for urban modeling, design and interactive participation represents the extensive and actual issue of the research, which aims for the wide-spread participation of public on the planning process. The development of the digital representation of the actual and planned interventions in the area, mostly presented as 3D models on the digital terrain, can create the digital parallel reality, which can be easily readable for citizens and readily modified. Digital model offers the conceptual framework for the urban, architectural and landscape design.

Urban design is the process of the creation of the aesthetic, social and environmental sustainable habitat. It is generally specified by the planning, negotiations, communication with the stakeholders in the urban area and looking for the consensus. The scale of interested participants is in the same time quite extensive and diversified. It includes decision-making and political segment (national, political and municipal bodies), experts (architects, town planners, departmental specialists), investor and developer segment, social segment (social, cultural, environmental bodies and inhabitants).



Figure 1.: Presentation of 3D digital city model, Berlin.

http://www.virtual-berlin.de/imperia/md/images/3d/breitscheidplatz_3d.jpg (10/2007).



Figure 2.: Presentation of 3D digital city model, Berlin.

New ICT tool are ideal for the knowledge exchange and public participation in town planning. Internet is the most dynamic and wide-spread platform for such communication, education and information requisities in the municipal sphere. In the last period a majority of municipal and

cadaster informations, interactive maps, master plans, urban studies and the systems of geographical databases were made available to general public via this tool.

Benefits of the application ICT tools for the public participation in town planning processes

- Availability of the complex spatial informations, regardless the time and space.
- Lucidity and readability of town planning documentation. 3D digital representations of the urban space enhance the perception of the planned interventions as well for the general citizens, unlike the 2D documentation, and enable to discern the consequences of variant design solutions.
- Possibility of the interactive communication and creation of the environment – participants can utilize synchronous or asynchronous communication tools to address their comments and suggestions to the town planning documentation.

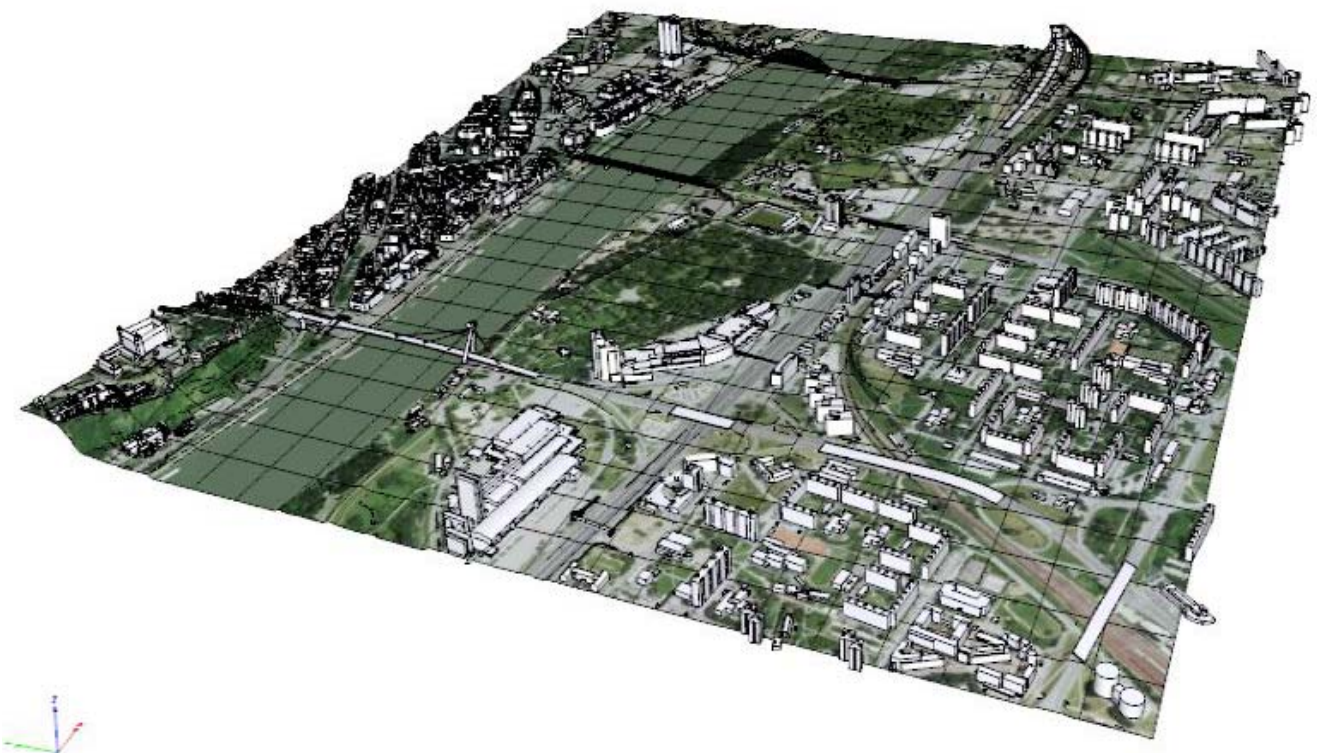


Figure 3.: Presentation of 3D digital city model, Bratislava. © Eurosence 2010.

Specification of ICT in the planning and participative processes

Participative 3D modeling integrates the human knowledge with the geospatial data. The best functionality seems to provide the GIS (Geographical Information System), as the geoinformation and geospatial analytical tool, which is integrated with the 3D models of mass structures, DTM (Digital Terrain Model), geobrowsers (Google Earth, Google Maps) and GPS (Global Positioning Systems). Bestowment of such complex information on the Internet with the complementing by interactive and communication tools, can significantly support public participation and human spatial knowledge.

„The paragon for the public participation is the efficient, photorealistic tool, based on GIS and available via web and Internet access“¹

Digital 3D city models are based mostly on the functional interface of sources like:

- Cadastre – parcels, buildings, ownership. Graphical data from cadastre are mostly 2D, but they represent important inputs for 3D modeling
- Satellite and aerial snapshots, orthophoto maps, DTM
- 3D models of urban structures, using CAD systems and texture mapping visualization
- Georeference information and databases

Housing and town planning issues in Slovakia

Town development in Slovakia and the ongoing housing construction were of extremely intense in the past years. It is a response to changes in social structures, as well as expanding economic opportunities of the population. It was partly stopped by the latter economical crisis. Exploration of the coincidence of the economical successful regions in Slovakia with the centre of the housing constructions resulted in the observation, that the formation of both sources are almost identical. Thus, it could be assumed, that for the new development of housing urban structures the crucial sufficient factor are investment means. But a sustainable designed environment should provide much more of the housing and living added values, which is able to increase the attractiveness of the development area for the residents and strengthen the positive relationship with their

¹ Tress & Tress, 2003

surroundings. Some of the fundamental factors of the sustainable housing design added value include:

- adequate proportion of amenities, services, greenery and recreational spaces in residential structures,
- integration to natural and urban surroundings and conditions,
- urban layout, traffic connections and space orientation,
- composition, aesthetics and perception of the urban interior,
- flexible and adaptable housing design on urban and architectural level, which can reflect the changes in the living period of perspective residents.

The process of town planning in Slovakia is still in the phase of the specification of new limits and boundaries, due to ill-defined land-use plan for most of the territory of Slovakia. Elaboration of the urban and architectural studies design based on outdated documents and sources is the ill starting point for the sustainable design. This situation induces an ambiguous interpretation of land-use planning information – or either its absence. Subsequently, the detailed urban plan of the zone is often redefined in accordance with the intentions of the investor, which results in the inexperienced and inadequate interventions in the area. Multimedia design of the housing urban structures can increase the assessment process of the design. The benefits of using multimedia design tools embrace the more objective evaluation of the design proposals and online public participation in the town planning process.



Figure 4.: Example of application using Google Earth, <http://earth.google.com/intl/sk/enterprise/commercial.htm> 3/2008.

Spatially well readable structures of 3D digital models, which can integrate existing buildings with

the new housing development, presented often in more variants, is the strong tool for the decision making process, important for the municipalities and city management.

Nowadays architects, urban designers explore the wide scale of tools for multimedia designs and presentations. There have been significant changes in the possibilities of spatial presentation of the design over the last five years, mostly in the term of:

- decreasing the time-consumption for the computation of presentations,
- availability of the sources,
- variability of tools processing the design,
- integration of the special conditions (changes of the appearance according to the period of the year, design variants, placement of the observer, ...).

Technologies, that allow a wide range of graphics options, but due to its time-consuming computation are not able to verify more variants, are more appropriate for the final presentation of the design. They are not advisable in the process of searching for a solution. The better accessibility have the tools of modern 3D technologies, which are freely available.



Figure 5.: Prague city center; modelling in Google Earth, 7/2009.

Applications:

The huge amount of geographic datas is used in planning and management projects of the area from the feasibility studies to the analysis of the impact of buildings on the environment. Open and free applications such as Google Earth, Google Map, StreetView, NORC,..., provide the most effective way to distribute project data within the decision process.

Such tools provide an overview, that allows rapid analysis of geographic data before starting work on projects. Allow "fly" over the site, providing instant overview of the whole area. The possibility to allow the vision of the future – what it look like, when constructed – provides much help how it will look after completion of the project. View the design implemented into the actual urban and natural environment offers the clear recommendance for the designers, investors, residents and other stakeholders in the area to have a clear reference on the design issue.

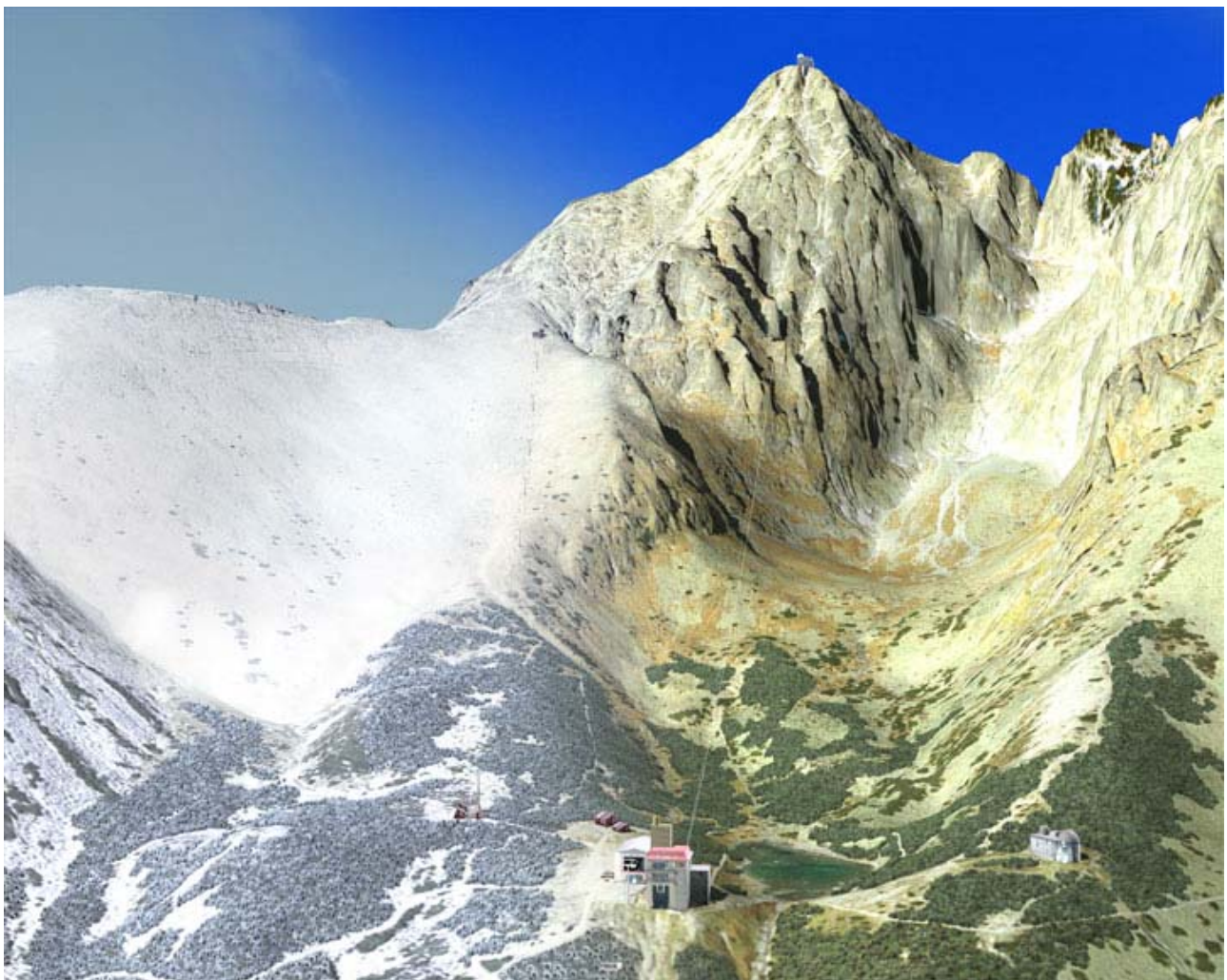


Figure 6...: Vysoké Tatry – using view in different seasons, <http://earth.google.com/enterprise/industries.html>, 2/2008.

Comparison of some available geodata applications²:

	Global applications		Local applications	
Application	Google Earth	Google Earth Pro	Norc.sk	Seznam.sk
Performance	limited	fleetest	limited	limited
Printing images	1000 px	4800 px	low quality	low quality
Integrating GPS data	yes	yes	no	yes
Advertising	yes	optional	No	no
Gaining email support	no	yes	no	no
Creating premium movies	no	yes	no	no
Importing and overlaying images	manual	manual/automatic	no	no
Performing batch geocoding	no	yes	no	no
Measuring of area	yes	yes	no	no
Cost	free	cca 300 Euros	free	free
Importing vector data	no	yes	no	no
Exporting vector data	no	yes	no	no
Type of utilization	personal	commercial	personal	personal

Conclusion

Urban design is a multidisciplinary process, influenced by the quality and flexibility of interaction between the partners. New information and communication technologies and the global net system offer the facilities for long distance coordination and cooperation of experts without the geographical limitations, so as the resources for global education processes. Creation of interactive environment for urban design and communication, based on the platform of information and communication technologies represents the actual issue of urban research and practice with the aim of wide public involvement in the planning processes. The development of virtual spaces of real towns supplies not only the tourists needs, but contributes to the knowledge basis of all participants of city life and helps them to conceive professional urban design plans and objectives and to participate at their design.

² <http://earth.google.com/support/bin/answer.py?hl=sk&answer=189188>.

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Paper:

The design of residential complexes in the waterfront areas structure

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OIKODOMOS is a Virtual Campus co-financed by the Long Life Learning Programme of the European Union to support housing studies in Europe. In the first two years of the project, 2007-2009, OIKODOMOS has developed, implemented, tested and evaluated an innovative pedagogic model based on a blended learning approach which combines on-line learning activities carried out in web-based environments -specifically designed for this Virtual Campus- with seminars, design studios and workshops physically taking place at the participating universities. The goal of the third year project activities (2010-2011), is to consolidate the pedagogic model, to expand the Virtual Campus to other institutions and to disseminate the project results among the academic and scientific communities.

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Residential Complexes Design in the Structure of Waterfront Territories

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Introduction

Prestige and image of the most famous cities in the world related to the symbiosis, which they were able to create with the river, that begets them. This quote very accurately determines the value of the river and its adjacent areas at the formation of waterfront area's urban-planning ensembles that are the hallmark of many world famous cities, such as Paris, Vienna, Budapest, Bratislava and also Volgograd – as the linear city, which 7 administrative districts, situated along the Volga river. Formation of the linearly elongated city is connected with the local natural economic and landscape environmental conditions. For Tsaritsyn (later Stalingrad, Volgograd), the main development factor has always been the Volga river. This water artery was a factor of attraction, housing and manufacturing. The linear planning structure with the planning framework made be 4 longitudinal highways (the 4th longitudinal highway is perspective and designed at the waterfront territory along all the city) became the result of the urban-planning formation evolution. Thus, the waterfront area plays the most significance role in the city image formation with the importance of the city's perception from the river.

Therefore, the residential complexes design in the structure of the waterfront areas is one of the most pressing actual issues of the Volgograd's modern spatial-planning development as well as for many other Russian and European cities situated along major rivers.

Currently, the main problem of urban development is the waterfront areas using, making them free from the industrial plants built in the socialism period, which up to nowadays separated city from the river, and didn't allow forming the system of comfortable waterfront and effectively develop the waterfront territories along the river.

The city's waterfront area has enormous potential: as an important component in the city planning structure, and from a position of forming a complete, well-maintained environment for the people, and in case of the area's investment, and social attractiveness.

Introduction to course and degree design projects real tasks on the design of residential complexes in the structure of the city waterfront areas has the priority in the architectural design education system at the Urban-Planning Department of the Volgograd State University of Architecture and Civil Engineering. This is primarily due to the fact that during the housing design at the waterfront areas a range of issues existing at these territories should be taken into account.

Factors and conditions influencing on the design of effective and environmentally friendly housing in the structure of waterfront territories.

For example the territory effective using, as there is a building site restriction which is associated with its landscape features, so you need to maximize building density, but at the same time to maintain the recommended storeys number specified in the "Rules for Land Use and Development in Volgograd".

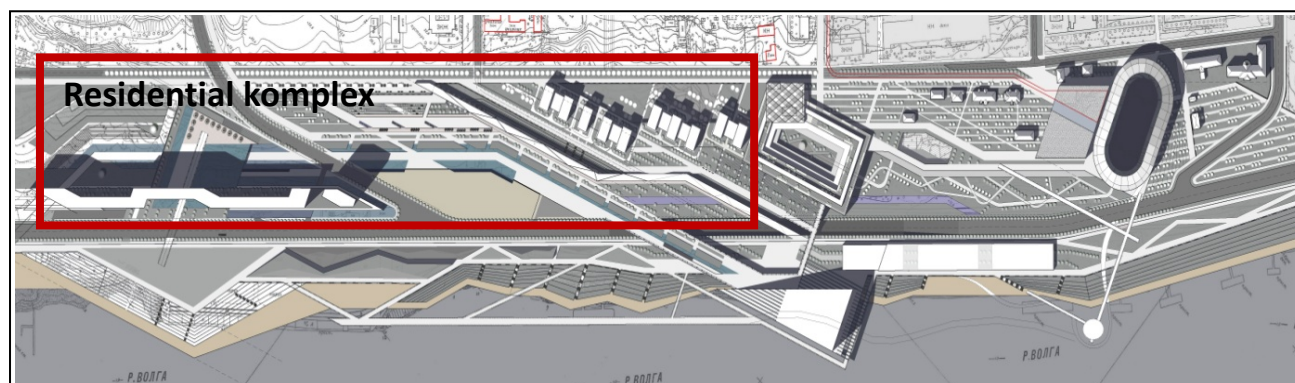
The next aspect having important urban-planning and environmental significance is the houses orientation–selection of the best houses location according to the wind (aeration) and insolation area treatment. Territorial houses distribution in the structure of the waterfront areas also influences on the constructive framework of the residential buildings, in many cases, limiting the variability of different structural systems. As usual in the residential buildings construction at the Volgograd's waterfront areas the frame-monolithic construction system is used because these areas are limited by seismic criteria.

Socio-ecological aspect in the design of modern residential complexes at the waterfront areas is also priority as the of the territory effective development through the using of underground space for parking.

Thus, multi-leveled and terraced buildings the waterfront areas with rather steep slopes of the river bank topography allows to increase density of the residential building development and to create favorable environmental conditions for the citizens through the using of terraces for the public recreation areas creation- green children's playground and small public gardens.

Returning to the problems of residential complexes design, at the urban-planning decisions we should take into account different ecological factors, such as Volgograd's microclimatic conditions and topographic features of the waterfront territory.

As the example of diploma design project can be discussed Maria Prohorova diploma project **“Urban-planning concept of the Volgograd's Voroshilovsky district formation”**. This topic touched a very important issue of the administrative district's waterfront area planning organization. This territory is one of the most comfortable in the city, filled with various social processes and includes historical and modern buildings. However, despite the comfort level of Voroshilovsky district, the residents have no opportunity to use the waterfront area, there is no interaction between man and water. Nowadays communal storage area located on the Voroshilovsky district's waterfront territory isn't a principal building and in the framework of the Volgograd's master plan should be conversed.



Masterplan

The project concept – multi-function public and recreation space formation with developed residential element.

Priority ecological measures according to the identified environmental problems.

The project proposals:

Use of relief's features to create the possibility of underground area using for transport infrastructure;

Multilevel pedestrian ways formation that don't intersect with the main traffic flow;

Effective and sustainable system of multilevel landscaping development.

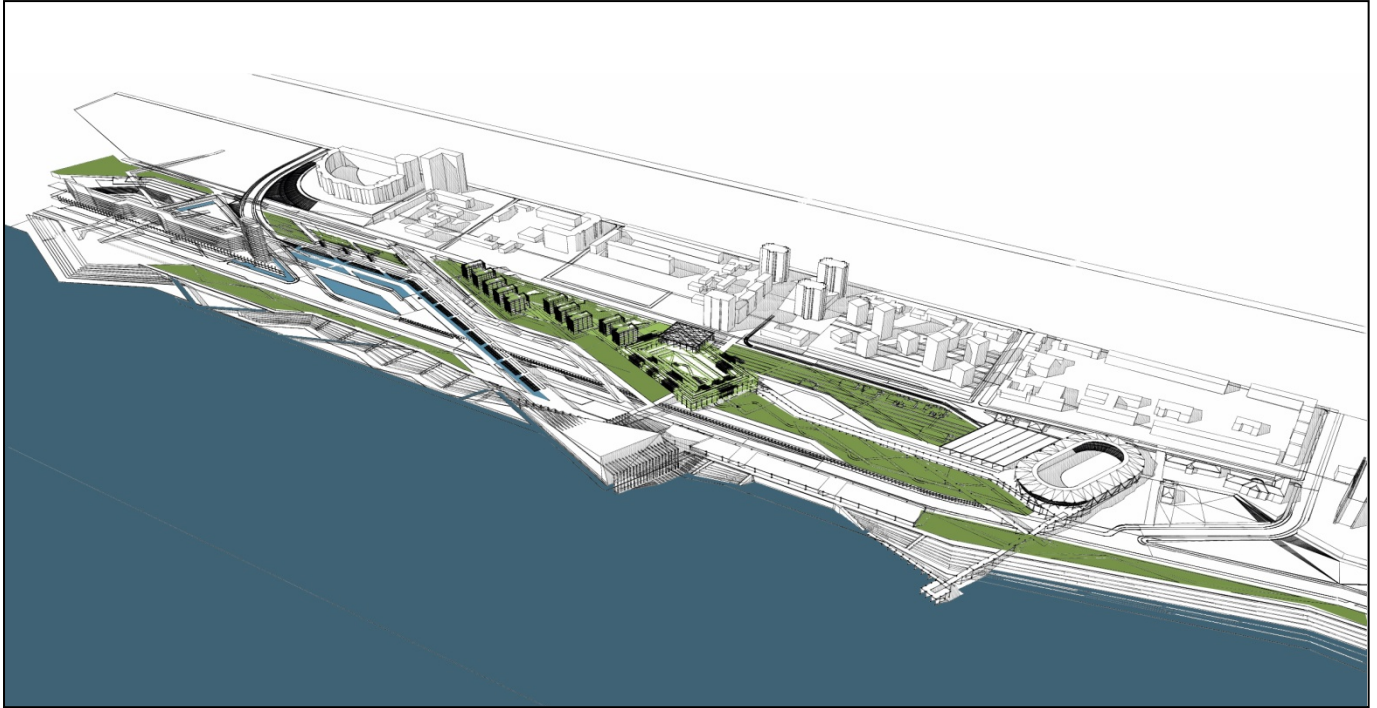
Ecological features of the territory influenced on the project solution.

The climate. According to the region's characteristics and preferential wind directions during the residential buildings construction the traditional planning grid can be changed to improve the living conditions up to the maximum. Thus, at this design proposal grid of the streets and

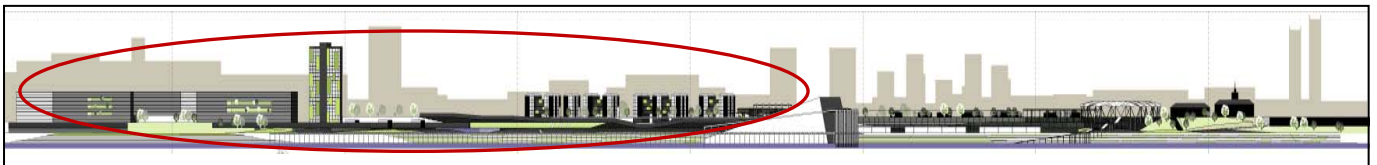
buildings has been deployed at the residential complex decision strictly to the cardinal points, which subsequently helped to solve many questions (up to trace the roadway).

To protect the buildings against overheating during the summer effectively vertical gardening facades system and green terraces construction on the basis of the principle of recreation area and walkways maximum shading was also used.

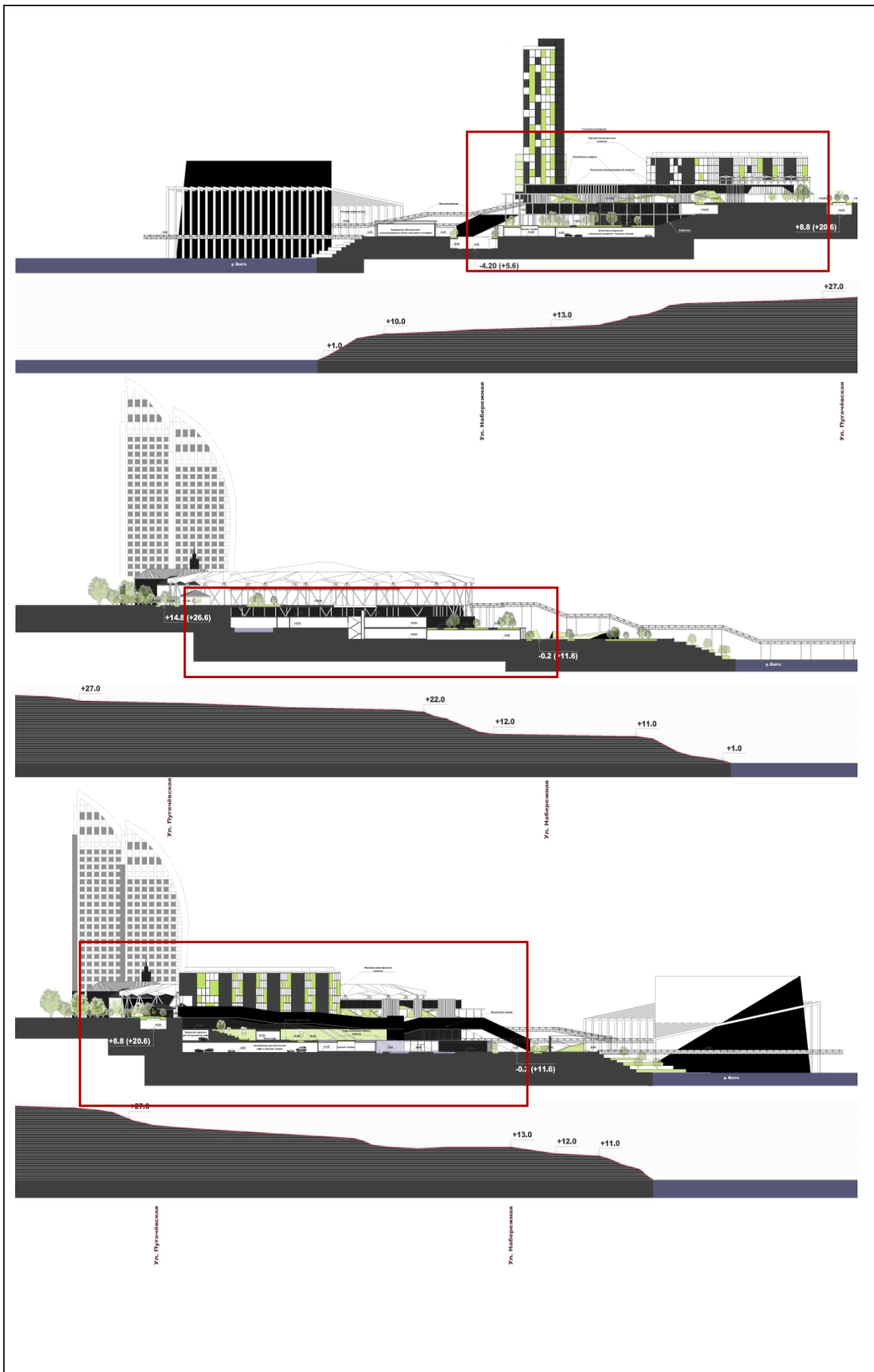
The territory relief also makes some construction limits. As the territory elevation within the river level and the projected residential zone is about 27 meters and 15 meters within existing streets.

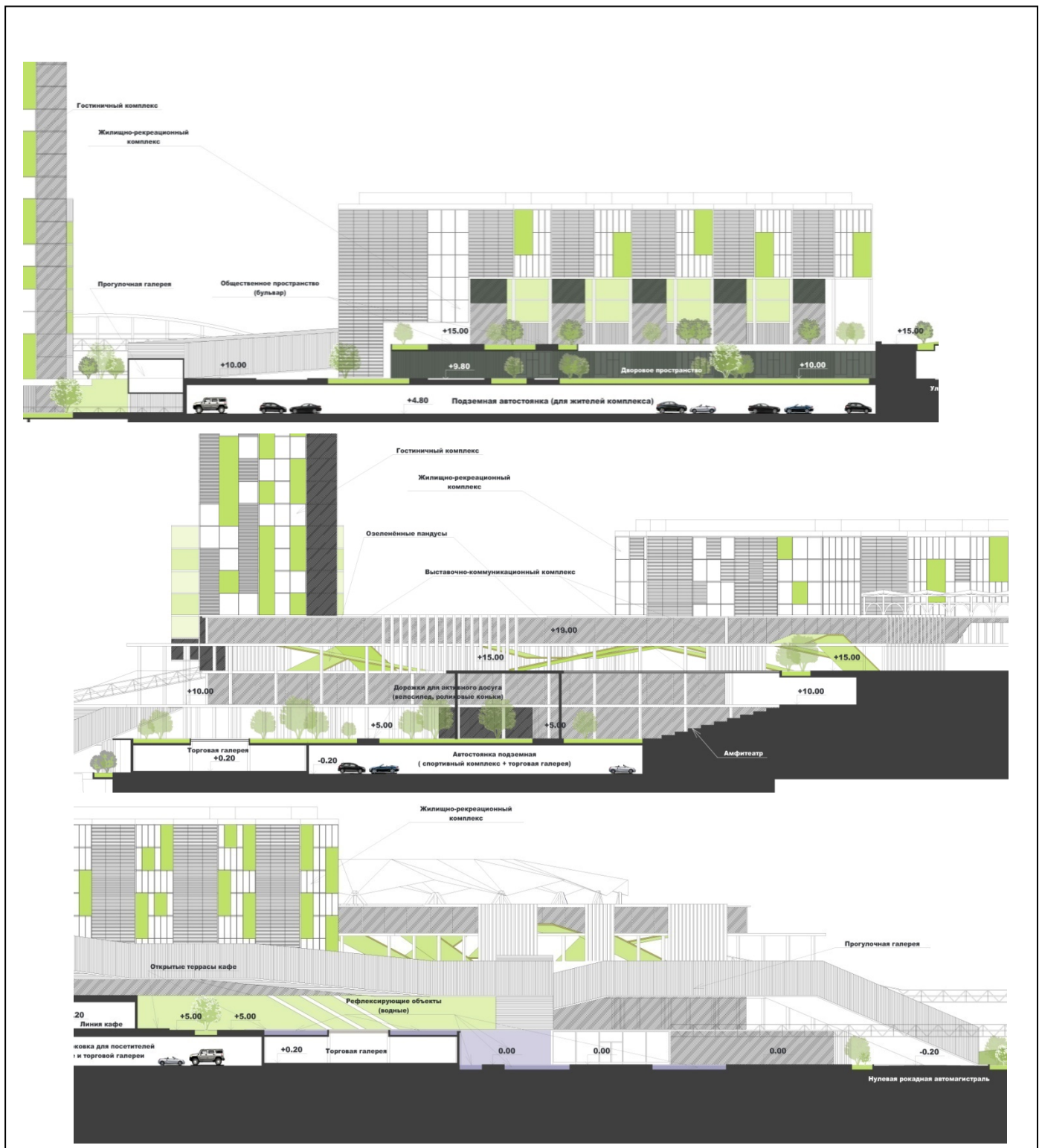


Waterfront territory axonometric view



Residential complex from the river side





The example of the residential complex organization in the riverside relief (over flood planes terraces) of the Voroshilovsky district waterfront

The importance of *energy-efficient houses* has increased on the basis of environmental problems that can not be solved without reducing energy consumption.

Energy-efficient house – is a building where all energy processes are optimized. Such house is able to meet the needs for heating and hot water to individual renewable sources - solar, wind, etc. In the mid-latitudes the main energy consumption associated with heating, energy- so the efficient house primarily minimizes heat loss.

Representation of the essence of sustainable development approach provides certain *design principle* at this project:

Reconstruction of old buildings and new areas construction within their full ecological development;

Maintaining a healthy balance between natural and built-up areas;

construction of environmentally friendly industries with only "soft", "smart", ecological technologies;
the use of environmentally friendly construction technologies;
Eco-friendly renovation instead of new construction;
construction of buildings and structures using spatial design and bionic construction principles;
construction of buildings and structures taking into account savings and efficient use of all resources - soil, land, water, etc.;
construction according to the renewable materials using;
construction of energy effective buildings.

Another example of the diploma projects with theme of the reorganization of the waterfront area is Yulia Ivanitskaya project - **“Urban-planning reconstruction of the part of Volgograd’s Traktorzavodsky district”**. The aim of this project was to create a new socio-adapted environment in the frame of city's former industrial territory.



Masterplan

Many riverside cities of the European part of Russia are characterized by common features of the industry location at the city urban-planning structure, due to commonality of socio-economic development and natural landscape. Analysis of the general plans of the Volga region cities revealed the presence of large areas of industrial development at the waterfront areas, its extended closing the river bank front outputs to the area of residential quarters. Meanwhile, for the life and city development waterfront zones are particularly valuable from urban-planning position - socially, economically, functional planning, recreation, landscape and compositional. As a result of rapid industrial growth from 1918 1930s. industrial sector captured the coastal cities of what was due to reduction of the production costs (water cost, cargo transportation cost) and the lack of stringent environmental regulations.

Today, there is an archi-important problem of reorganizing waterfront areas in our city , its social rehabilitation, and, accordingly, the subsequent intensification of its using. Volgograd's Traktorzavpdsky district is the northern industrial hub of the city and Volgograd's Tractor

Factory (former Stalingrad's) serves as an important city-forming object. It was founded in 1931 not just like another industrial giant of the Soviets, but also as an experimental urban-planning formation. All the planning organization layout of Stalingrad Tractor Factory, as well as the adjacent public areas was designed in accordance with the flow-functional diagram by N. Milyutin (Russian famous architect). Such spatial planning organization of the linear city became the most efficient, cost-effective and environmentally friendly for Stalingrad. A well-known fact that the N. Milyutin's theory of linear city was known to the participants of the IV Congress CIAM held in 1931 and had an impact on the adopted by them "Urban-planning Establishing and principles", later named "Athens Charter".

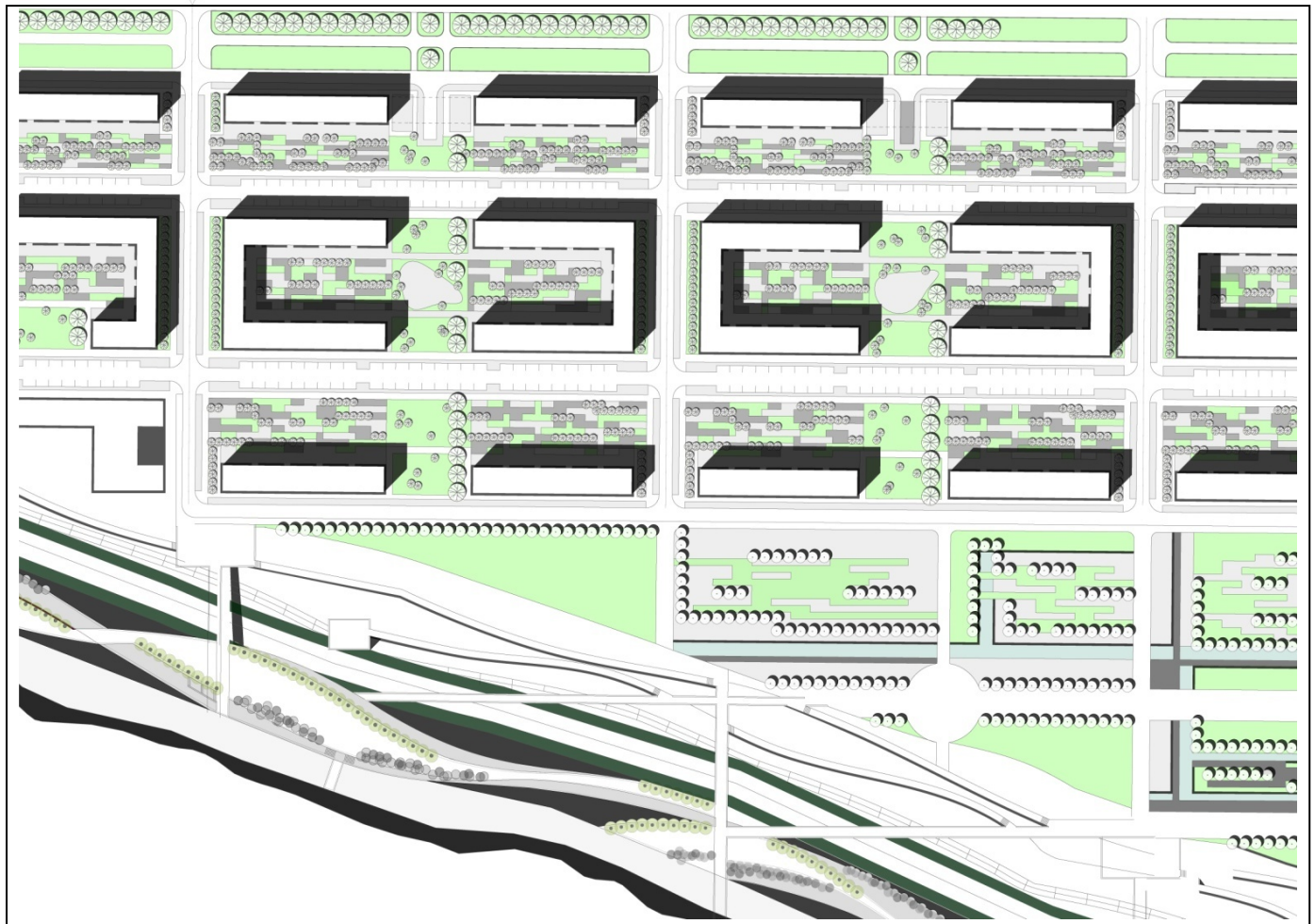
The project of Urban-planning reconstruction of Volgograd's Tractorozavodsky district part is based on provisions of the existing city's development master plan and is focused on creating a new spatial perception of the former industrial area. The design solution is the answer to the question about the potential of this area, its possible relevance to the modern city. Redeveloped site is located on the investment attractive waterfront area, but in reality, the society doesn't interact with the river, they exist in parallel directions. There's no more former scale industrial power of the Stalingrad Tractor Factory, no need to use the river for manufacturing purposes. And, apparently, this site conversion into more actual social needs is obvious. But still this area is some kind of marginal, socio-passive and aggressive environment. And according to the project proposal, we sought to create a new status of this space, make it a safe, comfortable, active, interesting, profitable and, of course, environmentally-friendly.

The main idea of the project is the conversion of the Volgograd's Tractor Factory into the multi-functional educational cluster; placement of "clean" production at the former factory part, and also the organization of serving safety green zone around it; residential zone increasing; the waterfront area transformation and the creation of interoperability of the river bank zone with the new public formations; continuous system of landscape framework creation, based on the natural features of the area (proximity of the river, topography, flood plain of a small river).

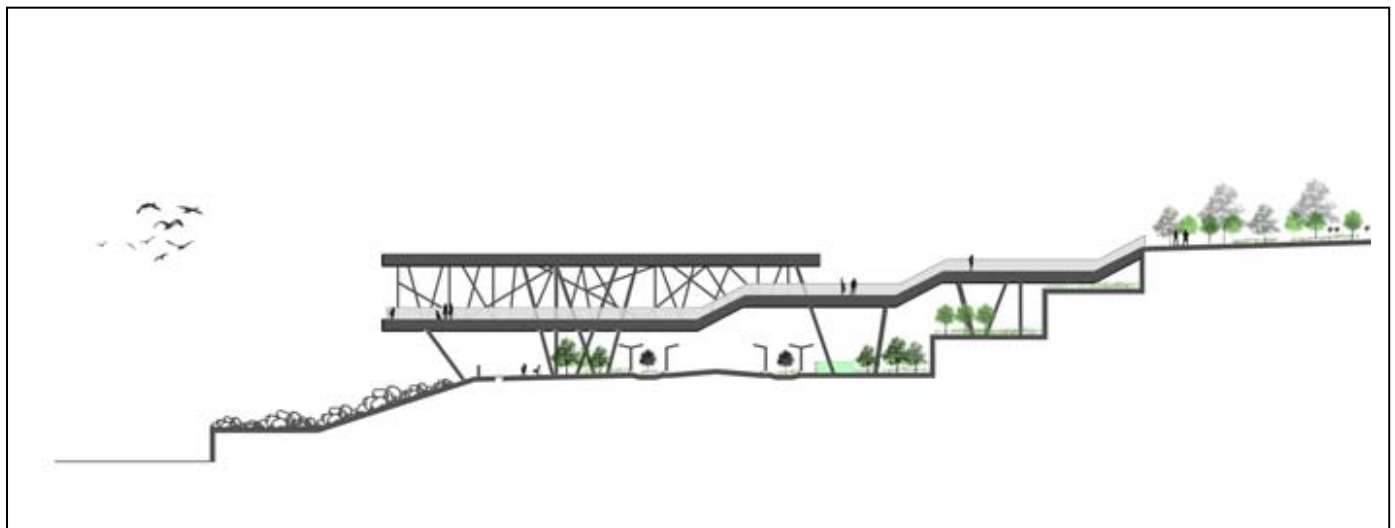
Thus, the design is based on the urban-ecological approach, its principles are: centric (human, urban environment), self-regulation (urban system), relationship (of nature with urban systems), integration (of environmental factors in the urban system organization), evolution (of the urban system in combination with natural factors).

The aim of this approach can be considered as the city planning structure transformation based on the urban-ecological framework formation (combining structural-planning and landscape-environmental frameworks) which provides a relative recovery of the ecological balance of the secondary natural and built environment necessary for the territory sustainable development.

The territory planning structure is an ideological continuation of the N. Milyutin's concept. Thus, an active social zone (Education cluster) is replaced by the safety green zone of new "clean" production and recreational areas along the transport line movement (car, tram), this zone is replaced by the residential zone that runs along the slope. The slope serves as a visual and material fencing of the residential quarters from the two-level waterfront space. Accordingly, the designed residential development is located on the waterfront territory, although actually it's located at different levels with the river. The design of new residential complexes became an important element of the project, as the creating of a new multi-functional public environment is also connected with the design of social environment that is attractive for living. After all, the quality of residential structures often define the characteristics of planning structures.



New residential quarters



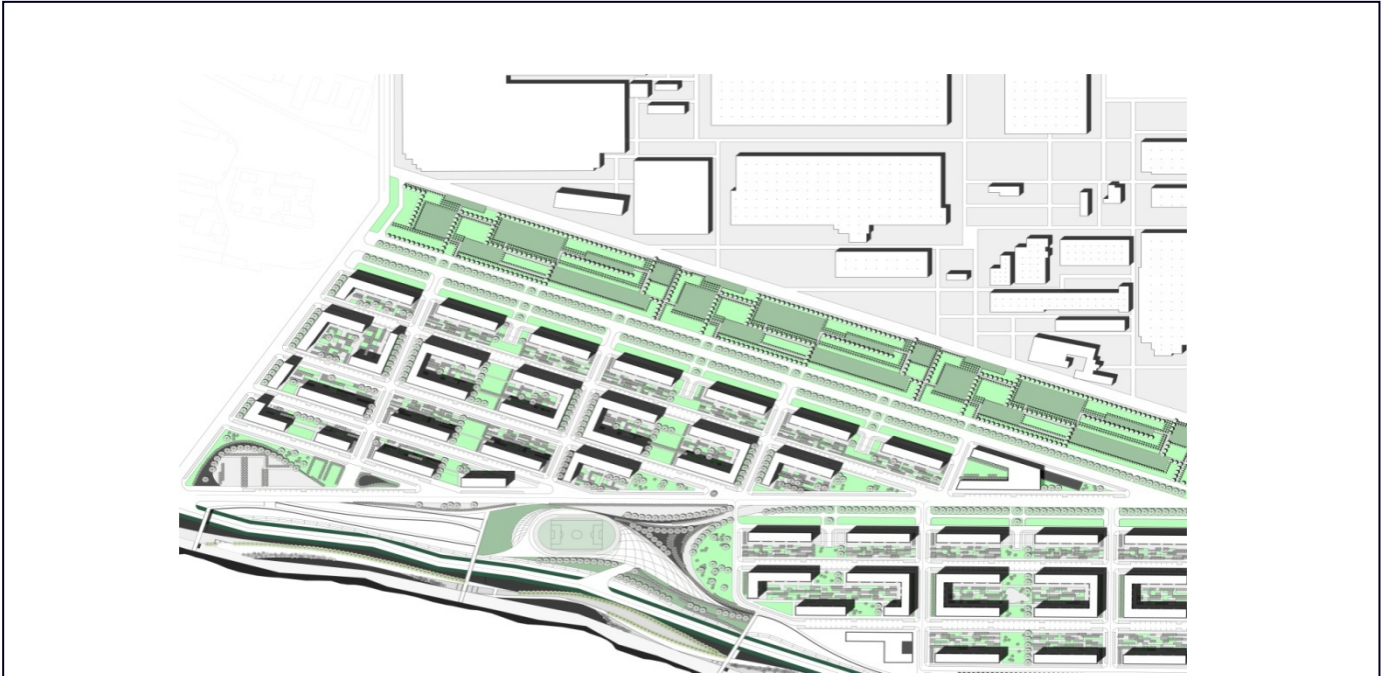
Two-level waterfront organization

Principles of the residential complex organization on the former industrial areas.

Urban-planning structure of the new residential quarters. Considering the climatic features of the city, as well as the territory specifics of the landscape-planning organization, effectiveness of the linear building yards becomes obvious. However, the project provides a new interpretation of the linear building N. Milyutin, expressed in the design of a linear plot with the inclusion of the perpendicular to the river houses. This new element of residential development is not only visually distinguishes the yard space from quarter to quarter, but also creates integrated into public private yard space. As there are kindergartens in such perpendicular to the river houses these architectural volumes will be placed on the columns (under ground), thus providing a

variable visual space, as well as provide proper aeration of the territory. It is also important that such residential buildings location gives for the citizens maximize visual access to the main element – to the Volga river, throughout all the territory.

Storey number of the buildings is from 5 to 7 floors, that combines the projected residential areas with existing (by Miliyutin) and allows to keep a visual "human" scale of the site.



New residential quarters

Using of certain building materials. The concept of "green architecture" today is associated with energy-efficient, economical and environmentally friendly construction. It is obvious that at the present stage of development of architecture and nature are in conflict. Buildings have a devastating impact on the Earth ecosystem. And eco-friendly building technologies and materials are able to create much-needed balance between architecture and nature. The project solution suggests not only natural and hi-tech materials using. For example, using of special membrane in the facades of residential buildings. Performance of the membrane depends on the abundance of surfaces, which are most in contact with the environment and create a unique opportunity to interact with the environment of the building the city. Air, water and light circulating through the complex surface of the membrane and used as a resource for energy generation. Among the various innovative energy saving solutions there can be noted specify external sun blinds, roof gardens, green facades, solar cells and panels. Rainwater collection system provides a watering plants on the buildings within a few days.

Effective transport infrastructure. In accordance with the Russian urban-planning regulations the courts are provided with access roads for service transport, as well as surface parking lots along the yards perimeter. The main placement of parking spaces located under the residential area. Considering the sequence of construction, the entire area of the underground parking lot is divided by the number of planned residential areas, to immediately provide comfortable accommodation.

Space landscape organization .Implementing all these new ways of space urban-planning organization is based on the system of continuous landscape net that permeates all the territory, from the river to the designed educational cluster. But this system of "green" chain continuous through the city's existing system of green spaces, it pervades the town-planning structure of the city, creating a strong eco-friendly framework.

Summary

Researching in our report is diploma projects, we seek to make a bet on the bold, forward-looking ideas of young architects. Despite young age Yulia Ivanitskaya and Maria Prohorova carry on architectural practice. They also researching the problems of urban-planning reorganization of the waterfront territories in the frame of their PhD works. The question of residential quarters placement in the structures of waterfront areas is still actual in view of the contemporary design and construction in Volgograd. Creating of eco-friendly living environment should become a priority criterion in the design concept of the waterfront areas reorganization. This concept is based not only on the construction of comfortable, environmentally friendly housing, but also on the integration of public space in private, the interaction of the city and the river, the opportunity of active using of ecological factors to create a various environmentally-friendly city space.

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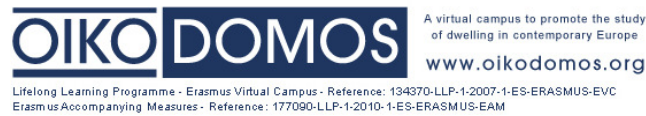
Paper:

Experimental houses: prefabrication and prototypes

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OIKODOMOS is a Virtual Campus co-financed by the Long Life Learning Programme of the European Union to support housing studies in Europe. In the first two years of the project, 2007-2009, OIKODOMOS has developed, implemented, tested and evaluated an innovative pedagogic model based on a blended learning approach which combines on-line learning activities carried out in web-based environments -specifically designed for this Virtual Campus- with seminars, design studios and workshops physically taking place at the participating universities. The goal of the third year project activities (2010-2011), is to consolidate the pedagogic model, to expand the Virtual Campus to other institutions and to disseminate the project results among the academic and scientific communities.



OIKODOMOS

Experimental houses: prefabrication and prototypes

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Key words: industrialization, sustainable construction, assembly, prefabrication.

Various and different developments in our society, have required different architectures all along the history. Since nineteenth century science and technology began to be included and applied to manufactured housing but focused in solving emergency situations and creating a not very favorable social conscience to this type of construction.

This development helped the construction process 'acceleration, leading a market where technological immersion allows for simplification and cost reduction, and searching for an innovation capable of reducing traditional linear processes. Nowadays we are facing a world where housing industrialization is changing the living concept, increasing its usability and the incorporation of new systems that change the way of fill the space gradually.

The purpose of this research is the analysis of the contemporary manufactured housing prototypes, where targets included are not only new building systems, materials, energy saving and costs, but where the social factor has an important role, because it affects the livability and design, and needs the true interaction between different actors inside and outside the building process. This new factor affects the habitability and design of the prototypes. This study is focused on a very popular process today within the building's industry: the housing project competition. One of this, "Solar Decathlon" appeared almost a decade ago, in order to upgrade the correct integration of renewable energies in housing design, which at the same time includes all necessary factors to pull progress in the dwelling

prefabrication process; including industrialization and technology, and peering the future flexibility that society is demanding ever more insistently.

Our university has taken part in the competition last year. Competition rules include constraints such as orientation, climate, square meters... and prototypes have to comply with some financial, time and materials requirements. And not only it will explore the techniques and their feasibility, it will start a discussion between idea, design, construction process and final result fusion; searching at all times the perfect combination of architecture, industry and energy saving, without forgetting at any time the users quality of life and their environment into these housing cells.

Checking prototypes once erected and tested, we can find that there are variable results for the different entries that prototypes have to submit in the competition, and several conclusions drawn arose. These results are analyzed in our research, but also the real influence of this competition on different economic and politic societies, to achieve these objectives.

Analyzing market viability studies, we can see both faces: the utopian one and construction and structural building systems within the modern architecture, such as patented methods and new materials studies. Finally, we will annotate the connection between the architectural process, and industry, becoming more and more direct and important. So that, we have to mix technical vision, ambition, innovation and social awareness in order to analyze, understand and improve the incipient state of development that nowadays is characterized by change and new needs.

Technological development has been accelerating the construction process, making patents appear, new building systems and materials or structures that have denoted these early forms of providing shelter development. However, we still have a situation where, in order to provide qualified architecture, the construction industry must go through the full industrialization; and must insert of a key factor in each design phase: the user and their needs. Thus appears the "architecture of quality," due to its subjective charge, a line of prior investigation is open: what does living in optimal quality condition mean?

The aim is to create an open market where the strategies and immersion technologies i enables simplification and cost reduction. However, technology is not so limited and it aims to help architects and builders to develop and use new systems and methods, in order to conduct all processes are conducted in a critical, conscious and entrepreneur way, fulfilling environmental requirements.

That leads us to a situation where buildings are more industrialized than ever, in special those related to dwelling. But considering it as a set of components positive or negative influence, forcing us to balance the relationships with the environment, energy conservation, materials used and ecological footprint among others.

Thus, we are in frame of continuous change and evolution with the requirement to innovate, the need to innovate by creating new housing concepts through the interrelation between different scientific knowledge areas. There are a lot of competitions about sustainable housing, minimum housing or self-construction

housing. They are impersonal, with the purpose of making a market impact and causing a mass consumption reaction. However, from the United States there is a collaborative project with the Department of Solar Energy, which aims to design, build and think about self-sufficient solar houses.

As a result, the Solar Decathlon was born: a global competition that starts from the universities with the idea of reaching cost-effective housing, attractive and energy efficient designed houses, taking into account multiple constraints, especially the user and their needs.

Designing and building an affordable, attractive and easy living housing, is one of the objectives of the competition. The design house has to produce as much or more energy than it consumes; at the same time to maintain comfortable and healthy indoor environmental conditions and supply energy to house hold appliances for cooking, cleaning and entertainment. Thus, twenty prototypes are tested for ten exams, which will be evaluated by a tough jury:

- Architecture contest.
- Market Appeal contest.
- Engineering contest .
- Communications contest .
- Affordability contest .
- Comfort Zone contest .
- Hot Water contest.
- Appliances contest.
- Home Entertainment contest .
- Energy Balance contest .

A set of initial rules that limit all teams under the same conditions: limited surface (it should not exceed 70m²), a footprint of the building (which will be 150m²) and one energy source (the solar one). Five calls have been held, twenty different prototypes have taken part in each other. A hundred prototypes have been erected by now that in the one hand make us reflect about different areas of knowledge and in the other hand about their marketing whereabouts on the other.

We start talking about the second call because the first one was a starting point about the concept competition, the objectives and the organization. We are in progress, research and inversion time, where universities are beginning to focus on technical, numerical and economic details; where industry and technology are the most important things for a construction view. Examples of this are the following technological developments:

- *Cornell University*: A unique feature of this house is the "Light Canopy," a streamlined framework of steel trusses that support a PV system, evacuated tubes for solar water heating, and a series of vegetated screens that provide shade in the summer. By design, the occupant can transform the canopy without house structural changes.

- *University of Texas at Austin*: The house has an exterior skin system that is customizable by the homeowner. The skin includes graphics and a dynamic polycarbonate cladding that creates an air space to ventilate the surface of the building. The structural system includes a series of moment frames (an especially strong frame designed to mitigate earthquake damage, as in "moment-resisting frame") that allow for an open interior plan that benefits superior ventilation and efficient lighting.



So that, new technologies starting a movement of "green design houses" whose advantages open up new concerns from the commercial field to education ones. Sustainable designed houses saves money by reducing operating costs, running without heating or cooling, and designed to be self-sufficient. It gives them an indoor environment with less health problems risk: they are examined about origin and investment environment, being participants in an effort to reduce carbon emissions and construction waste. Thus, it is proved that with no more than 5% more in construction costs, sustainably designed housing units use 30 to 50% less energy and 10 to 20% less water

There is a need to educate the user on the energy savings importance and how they are included in the design and ideation housing process. And thanks to the advances in this way, new lines of research and new concerns by all everywhere. So we have to focus on design before anything else. And for that, there will be an user who will take special interest in aspects such as sources of energy, reducing water consumption or the microclimate influence of the building components.

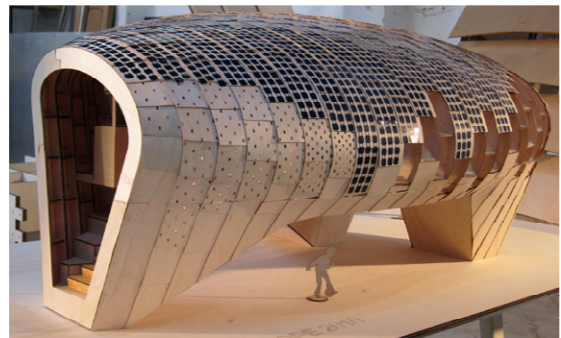
The first competition outside the U.S took place in 2010, highlighting the importance of this new knowledge and advancement source. That was organized in Europe, in Madrid, and will happen on a biannual and throughout the world, which will soon rise to a new line in Asia (China).

All this, on one hand show us the new expectations, awareness of the change and improvement of the situation need, and in the other hand it says that housing is first about human, by and for those who live and these are the first condition, before design, consumption and construction ones. However, there are many designs who can think facilities, energy efficiency, materials and construction systems / structures, and incorporation of a self-enclosure, at the same time; to show it on a design to emerge of a good dialogue between them. So it through of the each knowledge branches, but that even the structure competition enhances the disagreement between different integrate systems housing. So, users appear as an outlines specific conditions given end annex sometimes.

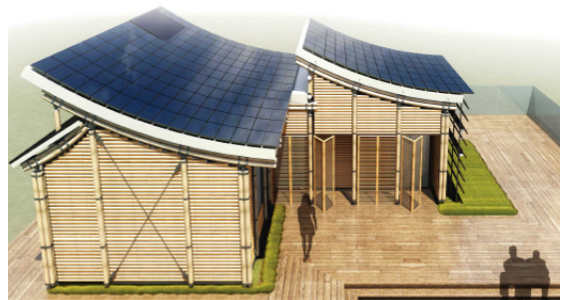
Also, the use of new materials will be accompanied by better use of existing ones, knowing that a wisely one increase thermal resistance, reduce potential for moisture or mold problems, source locally and regionally of low maintenance or consider indoor air quality using simple, natural materials. This situation gives us recycled or rapidly renewable, resource efficient energy and nontoxic manufacturing process and the emergence of patents.

The skins importance is greatly appreciated in the last “SD” competition, where most of the prototypes tried to compose a envelope throw different layers. First, we have the house code, which will be basically technical basic and whose ideation design will be built in the factory and introduced on site; then, the envelope acts as thermal, water resistant and low cost skin (in the overall economic analysis). This envelope will be done with natural materials and easy to implement and whose development can be made both in factory and in situ itself;. Finally, as a third skin, a coat: an architectural designed space, who shows the high-tech project (thermal envelope guard against climate hazards, capturing solar energy and where industry and technology are the real specialists).

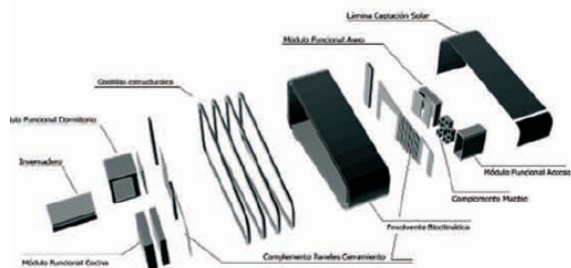
Skins that allow us to experiment with different materials. The French prototype showed panels made with earth, reminiscent of the primitive adobe, as an attempt to incorporate constructive innovation, a unique natural material far from typical and traditional wood. A Catalan proposal in its striking design uses this raw material, but a different and personalized technology: using a design, sectioning and cutting parametric system.



"BambooHouse" is the name of the Chinese prototype, highlighting the qualities as structural support of this material in a Western culture, with a lot of construction possibilities different than traditionally it's known.



But, away from the natural options, it is also innovative from the industry and prefabricated place: ceramic cladding appeared (the Valencia's proposal), cluster or even new construction concepts such as the closing-furniture (patent from Seville's team: solar Kit). Similarly, there are multiple uses of phase change materials (PCM) in enclosures, floors and other areas of the house, which help us to improve indoor climatic conditions up to a difference of 5 °.



These new proposals, both in materials and systems, require a comprehensive time of assembly and transport control. This is one of the main and critical points, not only for competition: since the management of the design process should include proper planning an assembly of all the pieces of the puzzle. And in all of this, the user appears as the main idea; thus our objective is to design a place adjustable and flexible, according to his needs and at the same time with the environment.

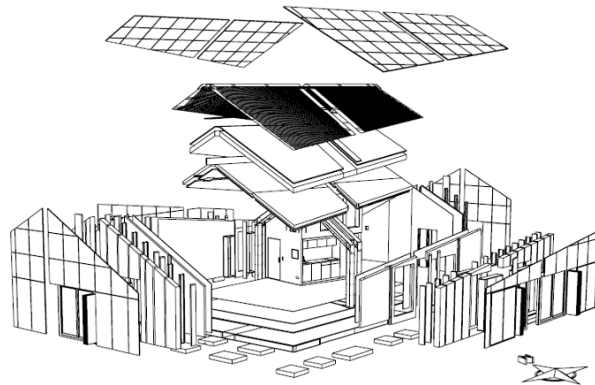


Seville University Team, Solarkit, understood this competition like an opportunity to take part in the international architectural scene. A great effort from the students and a high involvement from the teachers pushed the Solarkit prototype into the first SD Europe Competition. On one hand it was very hard to achieve sponsors and economic help. It was necessary awareness public and private investors about how important was a new investigation and innovation change; on other hand, to design and build the prototype before competition require months and months of continuous trial and error works.

The housing construction process is variable, despite of having the same time for assembly and a certain number of trucks for transportation. Thus, prototypes like EQUIA (from Berlin) propose a panel system from the structure to the openings, saving some transportable prefabricated modules. SolarKit (from Seville) or Florida's design, have a system built on site from the foundation to the roof, with perfectly fitted prefabricated modules that allow multiple permutations within the same design philosophy; that offers a true catalog of possibilities from flooring to furniture, through windows and doors. On the other hand, the winner team Virginia, erected a

prototype fully made almost in a factory: it consists of little modules that literally work as a plug & play system, and requires less assembly time, since it is limited to a quick and easy assembly process.

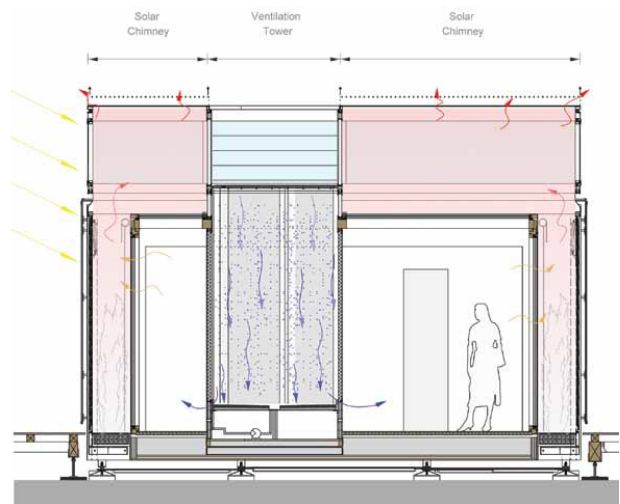
Different construction models allow to innovate in different elements. About the roof, there is much similarity between all the prototypes except from specific solutions such as the IAAC one: FabLab. They presented a completely curved roof covered with solar panels.



According to the interior house fittings, all prototypes are looking for a continuous connection with the outside place, having the user in its mind; without forgetting how to keep the best comfort conditions at any time.

Thus, there will be prototypes as Wuppertal, Stuttgart or Seville, that introduce "patios" in the interior of the building, to provide more light and a better heat exchange with the outside.

Others, like Finland or Nottingham choose to give a huge terrace simply, either front or rear, which connects with the home thanks to multiple windows of different sizes. But at all times, the need to be in constant contact with the outside is kept in mind.



And finally, one of the great questions from the material and human point of view is the whereabouts of these prototypes. It is known that none of the 120 prototypes has ever been reused as is set out in its competition; however, they have served as field test for many innovations and researches; as well as the emergence of patents and new construction methods.

Today, it is not intended to build developments completely or get clusters with any of them, not even intend to market these homes. The true aim of all of this is to pull the awareness of the people and of hundreds of technicians and specialists; awareness about the importance of a change, a breakthrough, an interplay of knowledge, without using people as conformist and mass consumers.



A virtual campus to promote the study
of dwelling in contemporary Europe

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Paper:

Housing and Neighbourhood stories: Approaching non utilitarian knowledge within the design studio

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OIKODOMOS is a Virtual Campus co-financed by the Long Life Learning Programme of the European Union to support housing studies in Europe. In the first two years of the project, 2007-2009, OIKODOMOS has developed, implemented, tested and evaluated an innovative pedagogic model based on a blended learning approach which combines on-line learning activities carried out in web-based environments -specifically designed for this Virtual Campus- with seminars, design studios and workshops physically taking place at the participating universities. The goal of the third year project activities (2010-2011), is to consolidate the pedagogic model, to expand the Virtual Campus to other institutions and to disseminate the project results among the academic and scientific communities.

Housing and neighbourhood stories: Approaching non utilitarian knowledge within the design studio.

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“The strength of a good design lies in ourselves and in our ability to perceive the world with both emotion and reason” (Zumthor, 1998).

Indeed, we all experience architecture well before we even understand what the word means; our experience models our understanding of space since our childhood.

While this article does not question the need to teach architectural students the very practical aspects of architecture, it presents different pedagogical design studio experiments led by the authors between 2005 and 2010, where the students’ knowledge emerging from them cannot directly be evaluated or measured but is brought to their personal experience to inform their sensitivity. Such assignments are deeply rooted in the student’s life experience.

During two academic years (2005 – 2006), an exercise entitled “Housing Stories” was proposed to the students within the studio focusing on housing design (BA3, MA1 and MA2 students). This exercise was inspired by the screenplay of the Swedish movie *Kitchen stories*. The aim was to confront the students with unconventional lifestyles or habitats. After selecting a number of places (monastery, squat, yurt, barge, etc) students were individually designated to meet the inhabitants and share their place of living for a few days. During the stay each student had to interview the inhabitants, measure the spaces and take several specific pictures. The collected material was used for an exhibition on the experience, but also for collaborating with graphic-design students and later for editing a couple of short videos.

Another experiment was conducted with BA 2 Architecture students in 2010: rather than asking the students to “conventionally” analyse the context of a site for a design project (site plan, orientation, direct context etc.), the students were asked to approach the neighbourhood through alternative methods (observations, textual transcripts and drawings, interviews with the habitants and local authorities, films, etc.) and to represent their findings with the help of digital media to allow the easy diffusion of their work to the habitants of neighbourhood they analysed. On the other hand, to approach this neighbourhood and to feed the engagement of the habitants, the idea was initially to spread the rumour of the construction of a terrible project that would have negative consequences for the habitants and the neighbourhood. However, the students quickly built a solid relationship with the people living in the area, which changed the course of the exercise, the way they transmitted their emotions about this area and beyond, their intentions for the architectural brief they were asked to design.

The surprising results of their work, the students’ feedback about this different approach to architecture and our conclusions are presented in this paper.