Retrofitting and adaptability in urban areas

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Abstract

It is becoming more and more fundamental to develop a new approach to the dwelling in the contemporary world of architecture. If the Candilis revolution was based on humanism and regionalism, the current reaction should focus its attention on technology and a multicultural perspective. Technology has already occupied a main role in the design process, however it is not in the case of a multicultural approach. What the modernists started to call 'Habitat' was intrinsic to the society they were working for. The project was designed in regards to one singular habitat, with one use for society. We developed that approach and have continued to use this mono perspective. It is now necessary not to carry the analysis and the research from one singular point of view but to expand on this analysis and research to incorporate the voices of many. [1]

Fig. 1. Casablanca&Utrecht: similarities and differences for cultural exchange

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1.Introduction

The Dutch government set a requalification national plan for a list of districts that are considered 'difficult' neighborhoods. Among these areas, Kanaleneiland is one of the most affected by problems regarding security, architectural condition of the buildings, integration, services and urban layout (green spaces and parking lots). For this reason the Netherland Architecture Fund is setting up a parallel and comparative design research in which I took an active part during my experience in Utrecht.

The greatest number of tools for building were tested and implemented in Casablanca during the fifties. These were taken back to Europe where they were applied in planning for large-scale social housing developments in the outskirts of big cities. The aim is to develop a basis for a comparison with the Dutch situation by using the analysis of the Moroccan, and more specifically the Casablanca city development, with its specific planning and appropriation processes. [2] Starting from the comparison of the two realities, planners and designers could derive solutions and theories to improve the condition of this district where the current inhabitants are mainly Moroccan (over 80%). Kanaleneiland is in fact ideal to experiment with possible solutions that could be 'immigrant proof'. Examining Casablancan processes as a source of inspiration to better understand the needs of the people that are currently living in the area could achieve this.   Technologies and strategies presented in this article try to find a possible solution and suggest an approach that could stimulate the process of renewal in these terms as well as in many other similar contexts.

2. Casablanca: the modernist laboratory

For European modern architects, colonial territories became laboratories in which they could realize their architectural and urban concepts. The "Sidi Othman" housing project (1951) by architects Studer and Hentsch and the "Cité Verticale" by Candilis, Woods and Bodiansky are two examples of these modern high-rise projects in Casablanca. They were located next to the "Cité Horizontale", a low-rise scheme of courtyard dwellings that was used by urban planner Michel Écochard for the large-scale expansions of Casablanca. These housing projects were designed for the new Moroccan workforce, however the rent was so high for most of the people living in the Bidonvilles that few could afford a flat that was "built for them."

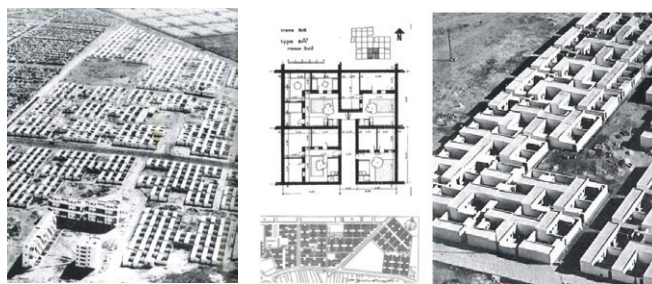Fig. 2. Citè Verticale housing project, 1952

Fig. 3. Citè Horizontale urban project

In an attempt to engage with the dwelling practices of future inhabitants, the projects were based on the concept of "culturally-specific" dwelling typologies. Already existing European assumptions of cultural and racial difference were the point of departure. Under colonial rule, these categorisations were reinforced and turned into a means of exercising governmental power. The first housing estates were built far from the 'European' city, so that the residents of this city center would not come into contact with

Casablanca's new inhabitants. During the period of decolonization these approaches travelled back to Europe, where they were applied in the planning for large-scale social housing developments. In the 60s, empowered by numerous government initiatives such as the "Opération Million" competition, architects like Georges Candilis and Shadrach Woods developed large housing schemes "for the greatest number", especially in the "banlieues" of large cities such as Paris, Toulouse and Marseilles. [3]

The tension between the formal and the informal city, between architecture by architects and architecture without architects, has existed since the very beginning of the modern urbanization project. Prompted by capitalist class-making and the influx of rural migration to cities, large housing programs and informal housing increasingly grew up near the city's borders—the city essentially began to build itself. The trajectories of this tension between the formal and the informal city were major attractors for the emergence of the modernist movement towards the end of the nineteenth century as well. Their studies of vernacular architecture in the Mediterranean and its aesthetics, functions, and structures were partially synthesized into the most modern form of new industrialized building types. [4]

Today, very few buildings of the great master plan for Casablanca resemble their original condition. Inhabitants have inventively appropriated, extended or changed the buildings through various uses and redefinitions. After all, the post-war plans by Studer, Candilis and Écochard were based on spatial concepts that anticipated adaptations and re-adaptations. That is the main reason of interest to our research. From a depth study of this planning we can learn a lot on how to create a fluid and adaptable system.

Fig. 4. Citè Verticale, appropriation processes, 2010

Fig. 5. Citè Horizontale, appropriation processes, 2010

One can diversify various 'levels of planning' as a basis for the development of a specified neighborhood within the city of Casablanca and determine the relationship between the growing level of planning and the appropriation process engaged by inhabitants themselves.

There is a clear inverse connection between the level of planning and the degree of appropriation from the inhabitants. Within the functional field we aim to match a specific cultural way of living with the functionalities of the dwelling, the layout, technicalities. Identity has to do with multicultural expression translated in different architectural style models. Room is made for culture specific design and symbols. The research that 'The Architecture Stimulation Funds' is carrying out, together with African Architecture Matters and partners in Casablanca, aims to find answers on the above questions and formulate suggestions for re-modelling the city in such a way that it is ready for changes to come. Several quartiers and housing developments have been studied in Casablanca. The original plans have been analyzed and inhabitants have been interviewed. This could provide solutions which are not solely beneficial to Dutch immigrants, but for the society as a whole. Likewise it might also provide solutions for future city planning in Morocco.

3.Retrofitting Kanaleneiland through a techno-urban approach.

The real failures throughout the '50s, '60s and '70s were caused by the bureaucratic system of the welfare state and its fixation on universal solutions, based on middle-class values. If we consider many neighborhood of European suburbs such as Kanaleneiland, Utrecht it is possible to underline common unease socio-architectural conditions.

A reasonable and realist way out of this self-inflicted dilemma had to be found by accepting the cultural fragmentation of current society and making the residents initially responsible for their own environment. In particular it's important to consider:

Fig. 6. Aerial view of the Amsterdam Rhine Kanal,
Kanaleneiland can be seen on the right side, red dotted line

The system of ownership, of dwelling and of public spaces, taking into consideration all the spaces in between. The economic aspect of the design process is becoming more and more fundamental. It is important to consider not only the construction/renovation costs but also the rental and real estate market.

Sustainable approaches in the restoration practice, taking into consideration the new standards in terms of efficiency and energy wastage. Old buildings are expensive especially from an energetic point of view. When it comes to renovation or restoration projects the main goal is to make these buildings sustainable and to improve the amount of energy consumption.

The need to restore and renew: *retro-fitting* is the challenge, enhancing the historical background of these developments but at the same time giving a contemporary interpretation that suits the current era from different perspectives (social, architectural, economical etc). Change and continuity belong together.

Immigration and immigrants need to be considered as central in the design process. There has been a shift from the original inhabitants to the current ones, in terms of cultural background, about architecture. It is fundamental to face cultural and social diversity. The fixed and regular Dutch plans for the housing market are currently not answering these problems, and immigrants have to deal with dwellings 'unsuited' to their original understanding of housing and living.

Appropriation processes are the physical expression of inhabitants' needs and wishes. The goal here is again, to turn these developments into something more open to changes and more flexible.

4. Strategies and goals

The aim of this project is to modify the district in a way that improves physical, social and economic aspects. Concerning the urban intervention, the aim is to re-develop of the waterfront, supply the lack of parking areas. It is important also to improve the connection between the district and the city centre, creating a mix of functions in the district that is solely residential at the moment. The realization of new meeting places in which people can share their different experiences and cultures has been taken into consideration as much as the renovation of school-educational sites. All these open public spaces have been designed as projections of the main spine (Marcopololaan) that will play the role of the 'central street' (Fig. 9). On the street level commercial activities will be introduced and the dialogue between the street and the surrounding areas such as the park will increase the differentiation of traffic and functions.

The idea is to create new views and perspectives that would appeal to residents as well as non-residents. Self-organized activity and spontaneous markets or actions need to be encouraged to revitalize the area and therefore need spaces where they can be expressed. The master plan shows these strategies applied to the urban existing layout with the red buildings representing the new developments (Fig. 10).
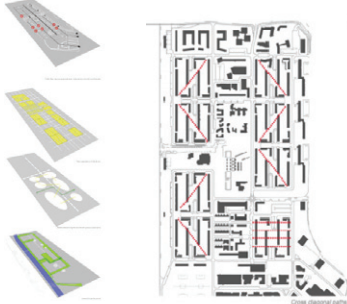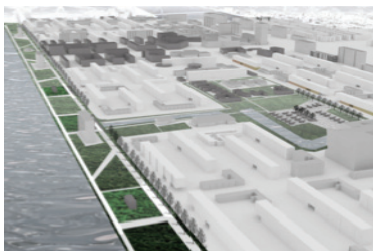
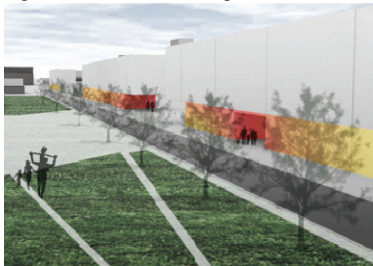Fig. 7. Generative schemes

Fig. 8. Aerial view masterplan

Fig. 9. MarcoPololaan, main street

Fig. 10. Masterplan

Since architecture intervenes and gives the physical solutions to the necessity of the inhabitants and of the neighborhood, it becomes natural that the main point of view to take into account is that of the inhabitants, therefore of Moroccan people. Green areas, as much as the commercial ones, need to be differentiated.   Similarly, the inhabitants' social level and background also need to be differentiated. As for the block intervention it is central the re-interpretation of pedestrian and vehicular circulation. Cars and traffic represent a big problem for the area, which needs to be solved, mainly leaving the cars in the space that surrounds the blocks. Studying and tracing the urban existing layout, I realized that the organization of the blocks and the internal distribution of the flats or single-family apartments is not casual. In this system, slowing down the majority of the existent streets has solved the traffic problem. The current dense net of road is completely unnecessary for this district. The streets in between two blocks have been turned into car parks. Cars have been segregated all around the stamps leaving them pedestrian only, to improve the safety for children who can play in the inner courtyard, but also to generate a pedestrian plaza that gives more possibility to the activities of micro commerce at the ground floor within the blocks. We traced all along the district these diagonals (Fig. 7) that seem to drive the organization of the urban layout. Nowadays this interpretation is completely lost and the majority of the crossings and pathways have been forbidden. Gates and fences arose almost everywhere; inhabitants have enclosed their gardens and turned them into rubbish or storage spaces. We need to enact change by taking into consideration the advantages that this neighborhood has to offer, such as the abandoned spaces. These diagonal paths would return freedom to the pedestrian and would bring a new look to the district. Pedestrians are motivated to keep on walking and discover what's next, and there is always a park, a green space, a market or a canal to encourage them to continue visiting the area. If we follow the diagonal line we immediately realize that it links all the blocks in a coherent and fluid path that respects the existing ones but opens up new perspectives.

5. Renewal project on the blocks: self-expression and flexibility. Metabolist utopia.

PREVI—Proyecto Experimental de Vivienda—an experimental district collectively designed by a generation of radical avant-garde architects who converged in Lima (Peru) in the late 1960s, was a pioneering attempt to reconcile the conflicting forces of informal growth and top-down planning. In PREVI, 13 internationally renowned architects, along with as many Peruvian architects, were commissioned to develop a model neighborhood of 1,500 dwellings to develop prototypes of urban housing that would internalize programs for any future transformation. Thus each unit contained the terms of its' own growth. This was perhaps the first act that recognized the value of the dynamics of growth adopted in the informal slums. In contrast to a growth model based on large, out-of-scale gestures —from mega structures to gigantic superblocks— the PREVI experiment fielded new dynamics based on a model of low-rise, high-density housing. The original houses are encrusted with geological layers: extra floors, pitched roofs, balconies, external staircases, faux-marble facades, terracotta roof tiles and bright coats of paint. It shows similarities to a form of archaeology, mentally scraping away these accretions. The houses were not the end but the beginning, a framework for expansion. It was revolutionary. Of course there was a tradition of the working class modifying their modernist offerings, as Le Corbusier discovered to his chagrin in Pessac, but it was never intended.   Chilean practice Elemental's "half a house" model, deployed at the Quinta Monroy housing in Iquique, is a descendant of PREVI. Although in many ways it is not fair to compare PREVI with the much humbler Quinta Monroy, the comparison is rather eloquent on the situation in which architects engaged in social housing now operate [5].

This approach is very close to the one followed to develop the renewal of Kanaleneiland. The idea is to follow the principles and the approach that Van Schachen architekten are carrying out throughout the country and propose a renewal of the buildings that will respect the original design but also add a new

and contemporary look to the existing, expressing the need and evolution of the family that occupies it. The urban, social and architectural analysis suggests only one way to act on the building: to act on the perspective of the inhabitants. Moroccan people living in Morocco had the chance to intervene directly on their own house in such a way that is not allowed in Europe due to the regulations and restrictions of European codes. The aim of this project is to set up a series of possibilities that could be applicable to inhabitants in Europe and would encourage them to do what they prefer with their own house, expressing themselves and their needs. The renewal project is based on the idea of setting up a grid and a structure that can be used for several kinds of extensions. A large abacus of possibilities has been studied starting from the organization of the ground floor plan. The functions addressed to each level vary from two or three room offices to small shops facing the square.   The new organization of the plan tries to bring all the night spaces to face the eastern side to enjoy the morning sun and collects the day spaces together facing west. The entry is reorganized to let people enter the apartment directly into the living room to give a warming and welcoming feeling that would enrich the quality of the communal spaces. Therefore the expendable spaces are thought of as extensions of the existing bedrooms on the east side: whether occupants desire a bigger balcony rather than a loggia or an extension of the existing room, this system will allow people the possibility of choosing the use of their outside and inside spaces. A variety of obscurant solutions are proposed: with the proposed system, the house could eventually turn into a more introverted system to accommodate families who are not familiar with the Dutch attitude and culture of the 'open house'. The new additions will be colorful and will characterize the block going forward from the actual anonymity of the system. The abacus of the possible technological and formal solutions is the main instrument that should be used to give the inhabitants the possibility to express their needs within a common order, respecting the guidelines of the project. Whatever the solution or combination of solutions, the result will still cohere with the entire system.
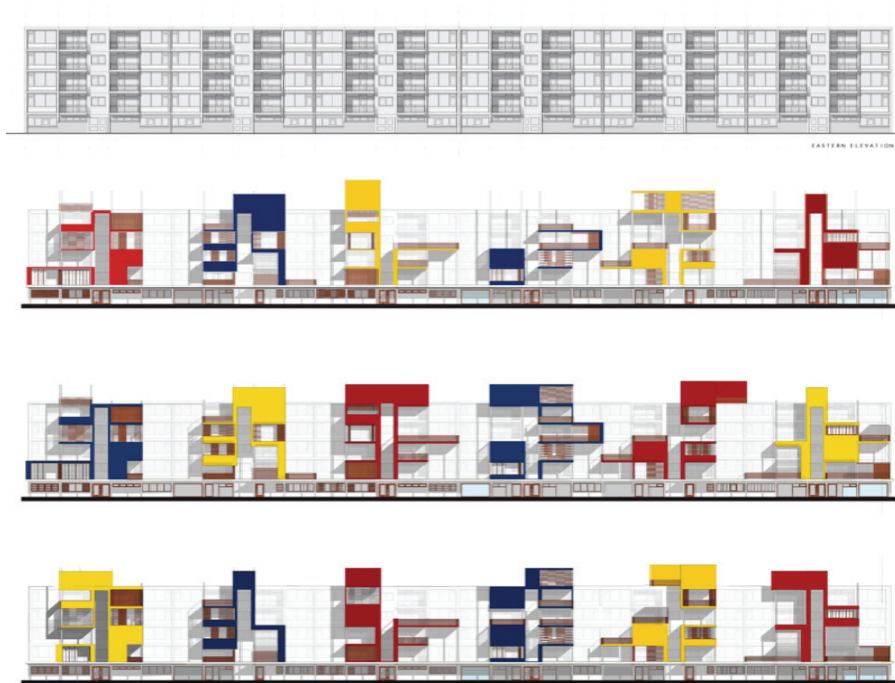

Fig 11 Possible evolutions of the elevation, modular combination according to self expression of inhabitants

Since the 'letters' of this alphabet have been studied as a modular system and can be joined together in multiple combinations, the 'discourse' that it will produce from inhabitants will have a positive result.

Architects' and engineers' role in the project consists of giving inhabitants the structure and the instruments to choose from. Forecasting the possibility and studying the pattern as a modular system, keeping in mind the development of different combinations, it is possible to let everybody do what they want with their home while still leaving open the possibilities for self expression, without clashing with construction codes and regulations. It is the metabolist utopia.

6. Sustainability and technologies as a frame for expandable architecture

The technology of prefabricated stratification elements is presented as an effective alternative to traditional construction systems. In this period in which there is greater attention given to energy conservation, efficiency in buildings and sustainable design, the relentless use of land, high consumption energy use and emissions into the atmosphere resulting from this, there is much greater need for technological solutions and architecture whose purpose is to generate energy-efficient projects. Sustainability in architecture means designs, which combine comfort for the user, while respecting the environment and using minimal amounts of energy. Sustainable buildings emit less greenhouse gases and their materials can be infinitely recycled. Aluminum can justifiably be described as the green metal: it is non-toxic and recyclable, easily formed yet strong, durable yet modern. Large savings in energy usage can be achieved using aluminum façades, which act as solar reflectors and thermal buffers. An aluminum facade can be integrated into the diversity of the architectural tradition. [6] The prefabricated technique is a system of sustainable construction, as it minimizes the use of materials that can as well largely be recycled. The wall plug that stands behind the aluminum panels has been designed upon the "Steko" system: five layers of wood make up each module, with outer and inner vertical boards glued to horizontal-grain battens and vertical-grain studs. The modules are stacked on top of each other in staggered rows. Dowels projecting from the bottom of the blocks fit into holes in the top of the blocks below, preventing lateral movement. The resulting construction is both weather tight and load bearing. [7] An external insulation of expanded polystyrene (80 mm thick) has been added to complete the wall package. Since the two structures are completely independent, I designed junction elements made of steel. One will be connected to the existing concrete structure and the other one will be integrated with the new steel structure. Considering the thermal behavior of the two materials the junction will leave air space and the possibility of movement, according to the different dilation coefficients. It has been calculated that after the intervention the U value would decrease from 3.085 W/m2K to 0.108 W/m2K respecting then the Dutch current guide lines. [8] Also for the transparent portion of the facade there would be an improvement from 5.686 W/m2K to 1.464 W/m2K (calculation on average typology).

1. 7. Conclusions

The research goal is to study the possible evolution of these buildings, how inhabitants will take over the architectural role in the future and will be able to transform their houses. This research could give architects' and engineers' guidelines and information necessary to design new buildings that they may then define as 'immigrant proof'. It could also enable the discovery of a new approach for the renovation of districts such as Kanaleneiland. From a top-down to a bottom-up approach, architecture can play an important role in the emancipation process to build up a more sustainable society. The multicultural perspective is the starting and ending point. Our current design for multicultural society is based on an unsubstantiated and narrow perspective that is proven ineffective. We need to give inhabitants a structural

and technological solution on which they may base their own personal changes and design processes. Studying several technological possibilities, on different scales, the aim of the project is to transform the district into a new multicultural and metabolist environment. New interpretations and new feelings will be brought into the area, starting from the master plan, continuing with the block courts and concluding with the intervention at the building scale. Looking at what inhabitants' need and desire, how they changed their own apartments in Morocco during the past fifty years, the challenge is to translate the research into a range of technological and other possible solutions that can improve our suburbs' situation. These districts could be the starting point for integration and re-interpretation not only of the architectural environment.
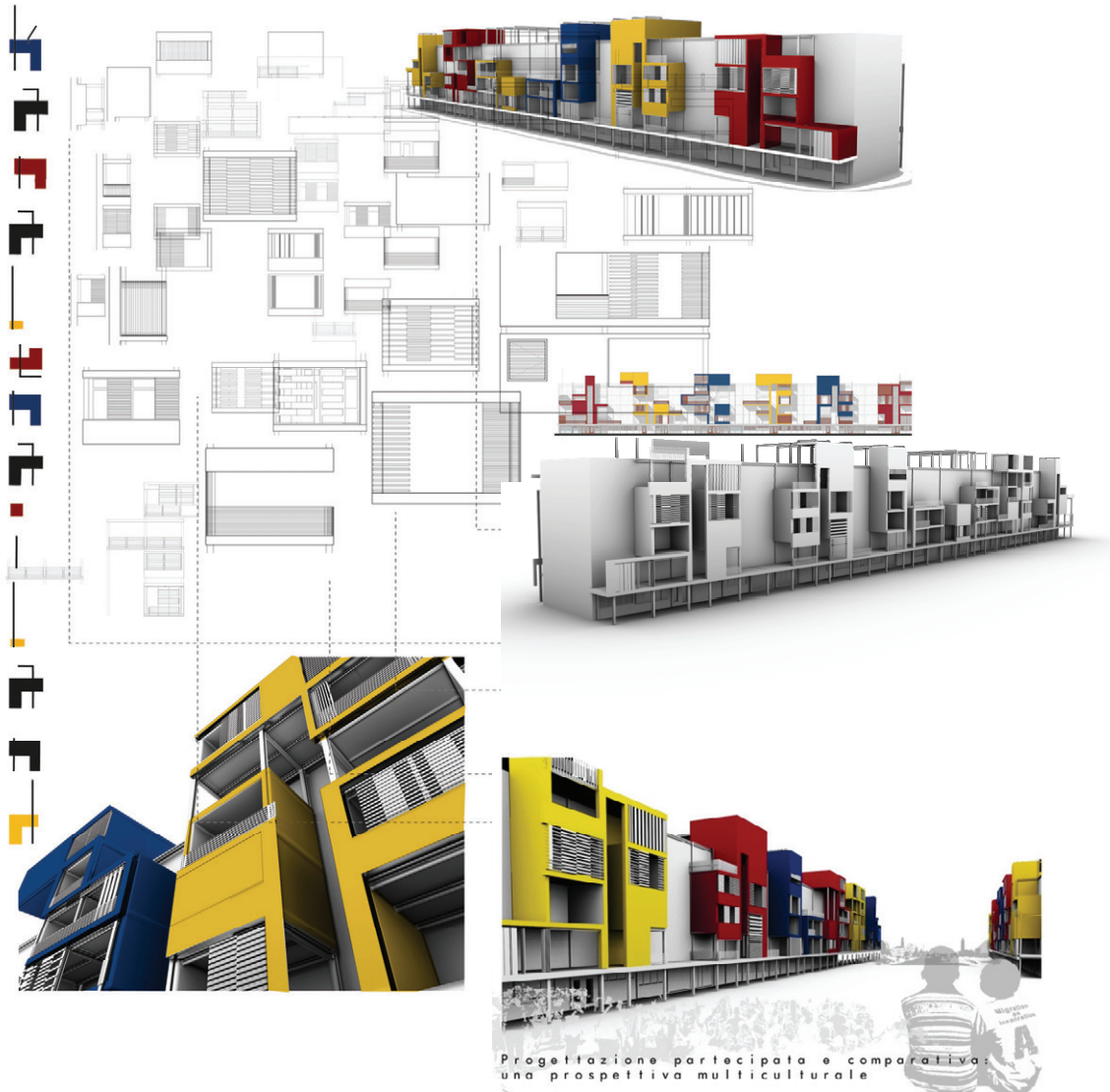

Fig. 12. Overview of the project

Acknowledgements

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