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Orientation Maps to reform Sensitive Areas in Informal Settlements

Urban frequencies to reconfigure highly entropic landscapes

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1. Introduction

Informal settlements in some of the major contemporary metropolis, demand the understanding of site-specific spatial practices related to the anthropological images (Lévi-Strauss C.,1958) that their inhabitants acknowledge of available urban spaces, in order to establish effective operations of architectural transformation and inclusion. Re-configuration in space and time for such congested environments happens according to fluid processes of adaptation and compaction, which are detected among typical constructive behaviors within their geographic and cultural background.

Permanence and history in informal settlements are accidental as quite often land appropriation and actions of micro-colonization happen according to self-generated non-linear performances. However, these sensitive areas assume the quality of urban thresholds between formal and informal morphologies, along which architecture can play a role of urban adaptor for the construction of shared and livable landscapes within the city.

These places feature similar characteristics to the acoustic space theorized by Marshal McLuhan in his idea of the “global village” (McLuhan M., 1969) . The space of the acoustic transmission of information is horizontal, continuous and enfolding. The construction of shared imaginaries can only happen through subjective and spontaneous participation, according to temporal sequences which are simultaneous at times and convoluted.



Within this framework of complexity, this research establishes the role of the map as the artistic operator that can retain a condition of reciprocity between multiple sequences of mobile elements within the landscape, controllable design variables, and places, in order to recreate ambiences of minimum harmonic meaning in a state of multidimensional compression. Entropy in this research is not perceived as the domain of the unfathomed chaos but it is field of possibility for architecture to tune morphological ambitions and corporeal dynamics with greater efficacy and precision.

Urban languages in current cities invite to master design driven processes with a new musical (Eco U., 2012), awareness. Recurrent frequencies in space and in time as a new generation of natural interfaces (Alexander C., 1967) can be employed as active forms of sense making assisting the immersion of people in uncharacterized places. The livability of a building or a settlement can be implemented insisting on the relevant reversible and irreversible processes that allow the existence of their very physical structure.

Embracing an idea of a pulviscular architecture of inner forces and exchanging potentials (Formaggio D., 1990), immersive maps are then organized following three stages of analysis and filtering. Recognition, nomination, and synchronization are the steps required to the design process to manage the pace of the strings of elements involved in the composition, contributing in the architectural definition of an inhabitable and commutative geographical skin.

Bringing the examples of a study focused on the African case of the capital of Tanzania Dar Es Salaam, produced in collaboration with Laboratorio Misura e Scala, Politecnico di Milano - DaStU, this essay will present a prototypes which reflects on the compositional possibilities of scenario design to implement openness in the contracted space of these urban enclaves.

2. Stochastic spatialization of moving objects

The conception of orientation maps is presented in this paper as a design method to approach the reconfiguration and transformation of informal urban settlement.

Orientation maps exploit an idea of stochastic spatialization of geometric values deduces from an anthropological study of historic agricultural settlements. This operation allows the definition of codes of propotional release of the condition of congestion and compaction which often characterizes suburbs and sensitive areas in our metropolis.

We refer to the term urban stochastic to identify the perspective of the architectural project when focused on these type of built environment. Architecture is required in fact to operate in the territory of precarious landscapes with temporary and moving variables and discontinuous morphologies.

This condition can be noted particularly in suburban areas and irregular settlements within contemporary metropolis, where the very elements which constitute the built environment qualify its geography in a provisional way.

The project then needs to foster design tools which allow to inform mutually related measurements and tracings between agents according to criteria such as flexibility and dynamism.

The orientation map represents then a matrix of several design scenarios which are interrelated through temporal frequencies of architectural objects following measures and spatial qualities derived from the anthropological image of primitive settlements.

Improvisation and motion become controllable variables of an urban project of local reconfiguration, replicating the informality and the elusiveness of these irregular territories. The original spatial culture of a population, together with the singularity and the exceptions of the topography they inhabit are intertwined to make public spaces in liminal areas more recognizable and livable.

3. Recognition of the anthropological image at the metropolitan scale

Revisiting the study undertaken by Lévi-Strauss in the text *Anthropologie Structurale* about the perceptive and ritual origin of the consolidated human settlements, the anthropological image of a place describes an

intuitive mechanism of organization of the inhabited spaces and its relationship with its environmental social context of civic aggregation.

The anthropological image is influenced by shared spatial behaviors and local traditions of appropriation and transformation of the territory.

The case study of the South American village of Bororo, the programmatic disposition of the principal dwellings belonging to diverse social groups follows a very precise sequence which allowed the inhabitants to recognize their roles within the society as well as the places surrounding the village to be characterized and oriented. The village is a geographical skin that traces and describes the topography of its own territory.

In complex and discontinuous processes of urbanization – such as the ones that distinguish the most degraded and informal parts of our cities – the morphology of the settlements do not always retrace the typical outlines of a rooted anthropological image as a tool of characterization of their architectures.

Such condition do not implement a sense of inhabitability of the place, as in this territory the typical signs of the traditional procedure of organization of the settlement are not recognizable anymore.

If we think that cities of recent urbanization such as, in Africa, the capital of Niger, Niamey, or in Tanzania, Dar Es Salaam, we can easily notice an additional problem. Even in those areas where spontaneous settlements seem to maintain similar morphological characteristics to traditional and historic villages, the space resulting from the parceling of the land struggle to achieve a communal connotation of public spaces, due to the uncontrolled metropolitan scale of the district.

This research intends to present architectural solutions to the issues related to inter-scalarity and inter-somaticity of informal settlements for which, the anthropological image – or the original rhythm (Fornari F., 1984) of the collective spaces of the settlements is recombined in minimal units of urban meaning, to recreate a corporeal resonance with the new metropolitan frequencies.

The orientation map is here illustrated as a meta-design tool for the agogic definition of new units of urban meaning, for their synchronization with the infrastructural rhythms of the metropolitan scale, in harmonic relationship with the slower and smaller measures that configure their primitive anthropological image.

4. Protocol of orientation

The protocol of orientation requires three stages of study and manipulation of the existing urban forms in resonance with the anthropological image of historical settlements. The process aims to formalize the structure of a new urban development according to an idea of agogic interchange between the space perceived and the one experienced.

Such method is based on a morphological and dynamic recombination of the elements and the measures that characterize original settlements with the geometric rhythms and the frequencies of the metropolitan scale.

The three stages are named as follows: recognition, editing, synchronization.

During the first phase (Fig. 1), the elements of the anthropological image and the ones that characterize the topography of the city are recognized, selected and employed as recurrent geometric variables, indicating precise scopes and periods. This operation leads the project toward a preliminary comparison between the units that constitutes the anthropological image of the historic settlement with the principal topographic drivers of urban growth and transformation (green infrastructure, water, infrastructural systems etc.).

The editing of the variables is a conceptual action of assemblage of the morphologies taken into account during the phase of recognition, in order to establish an semantic interdependency of the measures and the rhythms between original forms and topographic objects. Through this design procedure a new set of urban units emerge from the fragments of recognizable settlements.

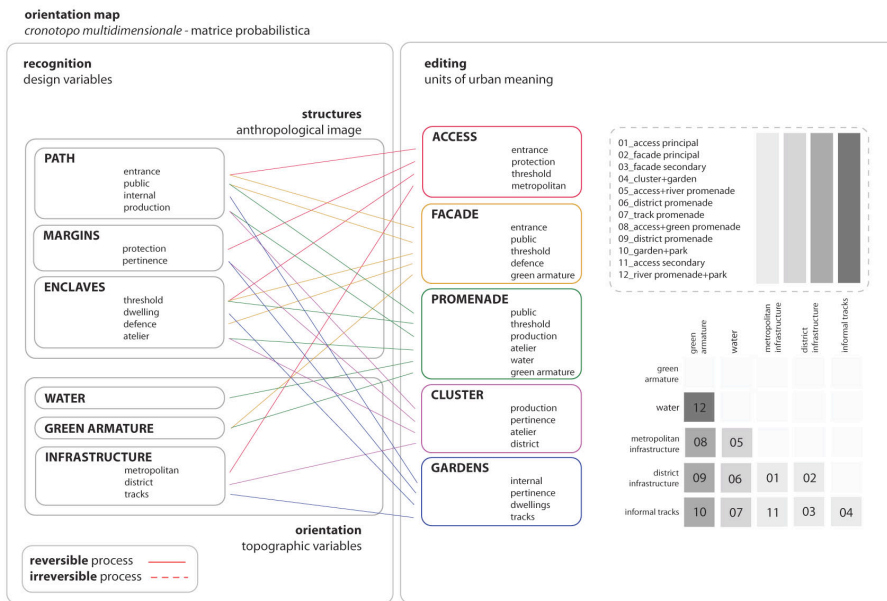


Figure 1. *The making of the orientation map: recognition and editing*

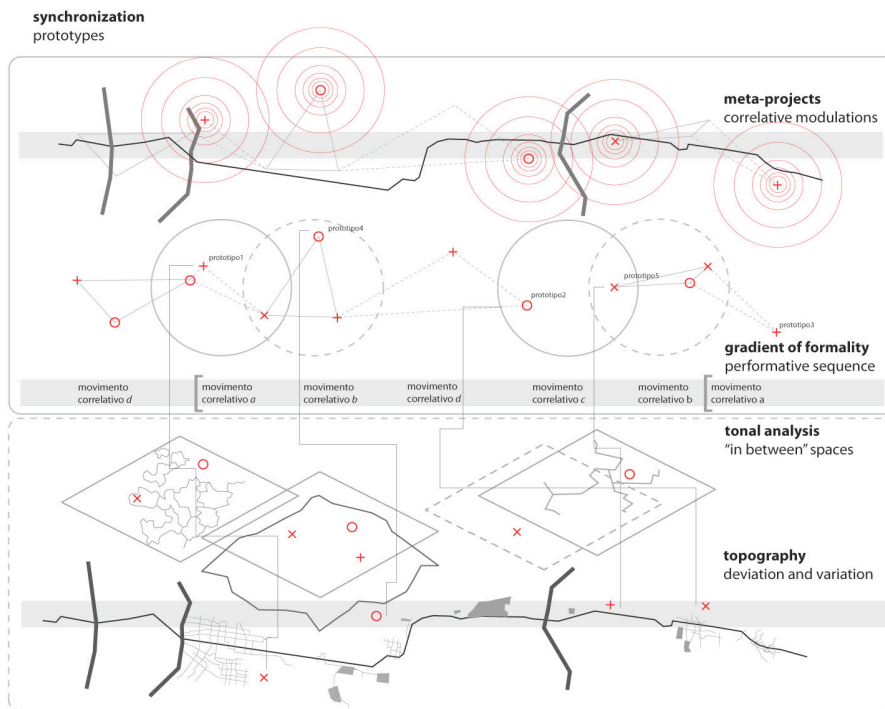


Figure 2. *The making of the orientation map: tuning and synchronization*

In the third phase of synchronization (Fig. 2), the morphogenetic orientation of the new urban type are defined embracing within the manipulation of the formal variables the chronographic condition of the project. The development of informal settlements is imagined as a sequence of immersion, guided by the discovery of units of urban meaning along the path.

From the performance of these three phases a multidimensional map is outlined with a direct reference to the geography of the place. The map intertwines the geometric values of the anthropological image with the harmonic instances of the urban sprawl.

The map follows a scenario design approach for which the topography is represented in its kinetic and diachronic condition, as a programmed sequence of orientation for the immersion in informal and sensitive areas.

5. Modes of synchronization and tuning

Among the compositional issues related to the synchronization of the unitary semantic material, a question of compatibility of the morphological nuclei with the consolidated structure of the urban settlement.

The matter of the inter-scalarity of the new development is managed in this research through a gradient of formality which organizes the disposition of the units according to rules of diffraction, refraction and reflection of the architectural objects along the district path.

The new urban type retraces its shape in tune and synchrony with the tones and the times of the historic dwellings at the new metropolitan scale. For this reason the gradient coordinates the progression of the tonal quality of the public space, while the rules of “energetic” repercussion of the architectural interventions arrange the rhythm of the constructions of such development.

The gradient provides an order for the local and internal configuration of the urban projects in relation to attraction and proximity of the variables for topographic orientation.

The phase of synchronization allows to localize the interventions necessary to a musical development of the growth and transformation of these sensitive territories. Diffraction, refraction and reflection enact three modes of the repercussion of the project in the form of three geometric variations of this articulation when the variables meet emerging topographic condition of the place.

The spatialization of the anthropological values of the settlement at the metropolitan scale embodies a reversible and generative behavior of deviance which leads the project toward the characterization of the place for imitation and modulation.

6. Dar Es Salaam, Tanzania, a case study

The first informal settlements in the capital of Tanzania, Dar Es Salaam, have been detected during the colonial period, from the second half of the 19th Century. Due to a remarkable increase of the number of inhabitants in the town, at the beginning of the 20th Century a severe inefficiency in controlling the informal sprawl can be noted. Since then, the urban growth was concentrated following a radial model along the main infrastructural routes, from the waterfront toward the inland (Shane G., 2011).

As a result of a morphological and sociological survey of the geography of Dar Es Salaam, the territory of the informal appropriation is characterized by a large variety of different land uses, including atelier, receptive services, agricultural features and residential enclaves. Dwellings have risen spontaneously, often in areas which were not designed for residential use. These settlements are normally managed and administrated by local clans, according to mutual agreements and private contracts.

The inhabitants generally comes from an agricultural background, typical of the villages of the countryside, and they are attracted by the economic possibilities of development offered by the urban conglomeration.

The control of the informal and irregular growth of the city represents a necessary action against the degrade and the degeneration of certain critical urban districts. However, the natural development of such settlements outlines persisting morphologies of the rural villages which often embodies characters of livability because their spatial setting are recognizable for their inhabitants. It is the new scale of the metropolis which makes more difficult to preserve the original identity of the informal settlement. This condition requires specific design strategies to recombine existing elements with the instances of the urban transformation.

In order to understand the spatial structure of such settlements, this design experiment tries to select and nominate the principal variables and measures which identify the informal enclaves in Dar Es Salam. At the same time, the analysis of the topography of the city highlights the drivers of urban growth and transformation.

The variables are catalogued in the first part of the orientation map as in figure 1, as well as the drivers which are listed at the bottom left of the board.

In particular, path, margins and enclaves are described in their different qualities according to the anthropological image of the rural village which refers to the Central Cattle Patter model, derived from the Twana tradition. Green armatures, rivers and water system, and grey infrastructure (metropolitan, district and tracks) are acquired as major driver of urban change.

Anthropometric variables and drivers are interpolated, describing five semantic units of urban spatiality at the metropolitan scale: access in series, facades, promenade, gardens, cluster of dwellings. A gradient of formality is then informed to geometrically coordinate the combination of the units in respect to proximity and attractiveness of the drivers. A general design strategy for the project establishes the relevance of the proximity of public spaces to water features and green armatures, while ateliers and spaces for the products tend to connect to major grey infrastructures and routes. On this basis private access and gardens as well as semi-public areas are distributed on the location of the new development.

Finally, in the last part of the orientation map (Fig. 2), all the steps of analysis and design are interrelated. The gradient of formality works together with the reconstruction of an urban frequency for the architectural interventions. The periodic reiteration of meta-project creates a musical language of irregular rhythms which sustain the “bass line” of the urban system in accordance with the measures and the rhythms of the original rural villages.

7. Conclusions and perspectives

The paper intends to outline some strategic element for the reform and the transformation of sensitive areas in highly entropic territories (informal enclaves).

The singularity and the uniqueness of the anthropological image of the historic settlements is analyzed in order to extrapolate innate measures and spatial qualities belonging to a specific construction culture for the characterization of the urban territory at the metropolitan scale.

The orientation map aims to mediate and recombine parts and measures of the anthropological image which is ingrained within the morphology of the informal enclaves at the scale of the urban sprawl. This strategy is based on the detection and the manipulation of the topographic features of the places which define controlled variations of the geometry of the new urban morpho-type.

Tuning and Synchronization of the new semantic units for urban reform are located along the principal lines of percolation according to a kinetic and performative perspective on the public space of the city. The assemblage of the variables in unitary nuclei is affected by the gradient of formality which produces varied scenarios and spaces of immersion in relation to the topographic condition of that geography.

In particular, the synchronization refers to energetic modes of diffusion and dissipation of the signals and the rythms of the architectural body of the new urban type. The periodic repercussion of the designed objects produces a musical and dynamic method for the morphogenetic definition of the public realm of the city.

Future perspectives of this research focus on the application of a similar design method for the making of orientation maps in respect to the idea of heterotopia presented by Graham Shane after Foucault [9] and within the immaterial and inclusive realm of the city of networks and digital interchanges.

Finally, in order to validate the method, a series of trial projects on different geographical and anthropological contexts should be informed. This approach allows to define and qualify informal areas over the ampler category of the sensitive urban enclaves, which is an emerging issue extremely popular in Europe as well as among the Countries of the tempered zone.

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