Urban Catalyst as the Tool for Public Space Transformation

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Abstract

The city and the concept of public space evolved the last century. Most of the successful public spaces of today are made, envisioned, designed, and realized not as sole entities, but as integrative components of an organism. The notion of what makes a successful public space is a topic worth investigating in the urban framework. What can this describe the present, even about future urban space? As architects we need to go beyond movement to think about what growth, expansion, and contraction can influence the urban tissue. According to Attoe and Logan, the notion of Urban Catalyst is an attempt to reopen the debate on strategies and tools to activate and rethink urban space and city development. This research would attempt to examine the significance of the urban catalyst as a means of urban revitalization. Bohannon, (Bohannon, 2004)states that the urban catalyst theory can be linked to place through the study of contextual factors in urban design. These factors include morphological, social, functional, perceptual, visual, and temporal points of view. For the urban catalyst to respond to its setting, it also must possess a strong sense of place and authenticity. The intent of this research is to serve as a prototype for demonstrating and testing the position and design process in the case of catalytic interventions. The methodology that will be applied has as an analysis point a serious of public spaces in the city.
KEYWORDS: Urban design, urban catalyst, public space, city transformation

Research Background and Objectives
Research Approach
This research aims to trigger the interest of two different types of readers: those interested in the catalytic innervations in the city and those interested in urban design methodology and approach. The former will find extensive and detailed concepts that address the urban design synthesis using the catalyst as a tool for design exploration. The latter will find the conceptual basis for the development of a series of generative design tools for urban design. This paper investigates the integration of design support tools to formulate, generate and evaluate urban design for public space. It defines theoretical models for an urban design models and metaphors, and presents the catalyst as implementation proof of concept for future design models and specifically in Tirana. Due to its complexity, the evolution of urban development in Tirana is something difficult to predict and planning new developments for a city such as Tirana due to economic, social and territorial factors needs an approach beyond the classic European models of urban development.

This series of relations throughout the urban fabric and be understood in two levels: on a micro level, as it is emerged from numerous factors between the diverse components and actors of the city, and on a macro level where it is informed from the territorial, social and economic relations which are formed in the extended urban landscape of Albania.

This research presents the urban catalyst as a method and a set of tool to generate alternative solutions for an urban context and design. This method proposes the use of a combined set of design parameters encoding successful design strategies used by urban planners and architects. The combination of catalytic typologies generates different layouts that are part of a "parametric" system, which can be informed from the urban structure of the city. These catalytic innervations can be developed from observations on the urban design framework in a formal, functional, social, economic and cultural level. The urban catalyst as a method and tool allows the creation of design solutions from a set of programmatic premises and fine-tune adjustments by pulling parameters whilst checking the changes in urban indicators.

Research Background and Crisis of Planning

During the post-industrial changes in the European and global context on urban design and planning there have been generated a series of different social, economic and spatial conditions in urban centers – a polarized map where certain cities enjoyed unprecedented boom and regeneration while others failed to improve using a strategic plan, often centrally located areas left discarded after the closure of industries decades ago(Oswault, P., Overmeyer, K., 2013). Today, we look back on almost three decades of radical urban transformation. Urban Catalysis is an attempt to reopen the debate on strategies and tools of planning, critically reflecting upon both disciplines, the shortcomings and innovations of development both inside and outside the vocabulary of conventional urban planning developing models of action and strategic planning tools, integrating the potentials of temporary uses into a long lasting urban development and forming an unique archive, which is now available to architects, planners, municipalities, developers, property owners and temporary users. The research case studies around Europe and the United States that are presented in this research paper represent a spectrum of diverse conditions in which architecture can act as an urban catalyst(Oswault, P., Overmeyer, K., 2013). These conditions could be considered pilot models for the European scene today. The success and failure of urban transformation processes cannot be measured by short-term growth alone. In order to develop an economic that is triggered positively by favorable urban planning and design conditions we must consider several scenarios of intervention in the urban ecosystem. While traditional state initiated models of planning are no longer affordable, especially in post-communist societies in the region of Balkans where Tirana is located, nevertheless in this case the radical shift to neo-liberal planning policies has failed to offer inclusive models. In this case through the use of urban catalysis, implementing strategic design actions for urban development will make more possible to foresee, predict, initiate and direct sustainable urban development within cities such as Tirana.

Research Questions and Methodology

In order to realize this research proposal a basic premise was used; "Architecture as a shape indicated by senses and auto poetic spatial complexity. Intelligent machine are the materiality of this complexity that fuses the inputs into a interactive folding surface". With this statement there are several fundamental problems raised:

-How Catalytic Architecture can redefine the public space?
-Does this self-adjusting smart architecture is used temporary or permanently?
-Which Tools could be applied to each context?

-What does it mean that something is catalytic and can act as a catalyst?
-What kind of project can be urban catalyst?

Responding to these cases from the hypothesis that different elements related to temporary functions and events can serve as the catalyst in the urban reality. The method of case study can be exactly used to discuss and analyses ten international case studies of the Catalyst in order to classify the elements that defines the features of the design catalyst and find the ones that could be possibly be implemented in public space of Tirana. The approach of case study has some benefits: the case study is a kind of empirical study rather than a purely theoretical one. It encourages researchers to answer the 'why' and 'how' questions more than the 'what' questions. Meanwhile, the case study makes researchers pay more attentions on details. Thus, in this paper, are analyzed the design sites, covering the analysis of buildings, facilities, greens, spaces and so on. Finally, this kind of method requires an integral and comprehensive thinking of a whole perspective and lead researchers consider how the elements affect with each other.

Literature Review
Urban, Cultural, Economical Context
Urban development processes in Europe produced a series of time gaps, in which former uses of architectural and urban space come to an end during paradigm shifts, whereas the future use has not yet started. Thus, this spatial vacuum is a fundamental and necessary urban context in order to allow for temporary uses in cities. The economic context is strongly linked to the urban situation mentioned above.
Socio-economic factors, which impact the level, density and pace of economic turnovers in a city, are linked directly on the investment capacity, which local market ecosystems offer(Oswault, P., Overmeyer, K., 2013).Economies within cities, which are designed to act strategically adapting also cases where public and architectural space can be also organized permanently and temporary, provide similar organization in economy. While cases of successful urban catalysts begin operating as a model to attack a niche market, they are still linked closely with the local economy being able to grow faster in areas with high urban interest and low economic risk. It is important to notice also that in cases as such it is fundamental to understand how the catalyst can initiate alternative models of economy which can be oriented through barter, social capital and re-use of existing assets within the city, being translated as strategies which offer considerable economic value. Case studies with similar approach can be found in cities like Berlin, Oslo and Copenhagen where certain needs for development in the market were the initiator of catalytic strategies but cases also like New York, Rotterdam, Arnhem and Madrid where local and central government with the use of national development strategies in urban planning and design were able to support the new and growing economy.

The common ground of the cultural context among the cases studies of this paper – and also for most other European cities – is the new connection of established and new cultural economies. The new focus on the innovative strength of cities goes along with the rise of so-called "cultural catalysts". Central for the transformation of the cultures of cities is the shift from cultural consumption to cultural production and support. This transformation will to a large extent depend on the opportunities a city gives to through

strategic planning in the development of projects that will provide a catalytic ecosystem for development

The differences among the cities of this research cannot necessarily be generalized as national differences since they provide common short or long-term strategies for interaction. Within a country, differences in the regional contexts as well as the size of the city can create a larger difference than between similar cities of different countries. However, certain conditions, which are favorable for catalytic interventions have been identified and its implementation would certainly be valuable for urban development across various regional contexts(Oswault, P., Overmeyer, K., 2013).

Urban Design Theories, Models and City metaphors

A series of models which influenced urban development and thinking in Europe is the theoretical foundation of this research, understanding existing approaches but also going beyond the classic tradition in order to go towards a new model of strategic and catalytic thinking. It is important in this point to understand the various urban design theories that were the reference point of development in Europe, and if different models can be reorganized in order to introduce the concept of urban catalysis based on such re-organization, as a notion proposed by Attoe and Logan in their book "American Urban Architecture: Catalysts in the Design of Cities". The categorization process is not so simple because many theories tend to fit in more than one model. A formal way of categorization requires some thought process. The best way of doing this is by jotting down all the theories in one blank page (to get the holistic sphere of influence) and to see how they fit or connect with each other.

- The formalist stance pioneered by Frederick Law Olmsted was the Park Movement, which focused on the introduction and integration of natural systems into the city and influenced design of greenbelts cities and is still influential in designing eco-cities today. Another variant of formalist tradition was "City Beautiful Movement" which was rooted in Renaissance and Baroque urbanism and looked at the city as a network of formal streets and spaces, marked by striking monument.
- Camillo Sitte believed in re creating medieval cities and treated urban spaces as aesthetic arrangements of building masses, facades, and street spaces.
- "The Garden City" model, by Ebenezer Howard was developed and advocated by Raymond Unwin, Clarence Stein, Clarence Perry and many others still influence today's neo-traditional community.
- Tony Garnier introduced a model which was later developed by Le Corbusier and applied by many like Edmund Bacon and Lucio Costa, looked at the city in terms of efficiency and function and tried to create urban space using new techniques of construction and transportation.
- Urban design theories by the likes of Gordon Cullen, Kevin Lynch, William Whyte, Christopher Alexander and post modernist Denise Scott Brown and Robert Venturi which cannot be really plugged into any of the four models described above and can be called a fifth model.
- The New Urbanism Movement aims to reform all aspects of urban design and create walkable, dense, mixed use neighborhoods.
- City form theories like "Edge City" and "Generic City" are also important while studying the evolution of any city. Probably these theories together make the seventh

model. (Aryal, 2008)

In order to understand the structure on which a city operates it is important to use the notion of metaphor and parallelization providing practical architectural examples of thinking. We can analyze in depth and breakdown fundamental elements of organization in existing models through comparison and association with several metaphors. According to O.M. Ungers, in our everyday language we are constantly using metaphorical expressions without paying any attention to them. For instance, we talk about the foot of the mountain, the leg of a chair, the heart of the city, the mouth of the river, the long arm of the law, the head of the family and a body of knowledge(Ungers, 2011). We use many words that are vivid metaphors although they exist as common ex addition to the words, everyday language abounds in phrases and expressions of metaphorical character such as: straight from the horse's mouth, the tooth of time, or the tide of events, a forest of jungle of the city. It usually is an implicit comparison between two entities, which are not alike but can be compared in an imaginative way. The comparison is mostly done through a creative leap that ties different objects together, producing a new entity in which the characteristics of both take part[1].The use of metaphors in urban studies is nothing new; for long metaphors have been widely used in urban theory and urban planning (Gerber A P. B., 2014)notes that architecture and urbanism have elusive and hard to grasp objects. Metaphors help to understand what is at the core of these disciplines, which can only partially be captured by language.(Larsen, 1998). Writing on urban culture, calls his contribution 'The city as a postmodern metaphor'.(Marcuse, 2005); Suggests that 'city' is often use dina metaphorical sense, and he distinguished three usages with political overtones:
1.Citiesas actors(cities competing, winning or losing in the global economy),
2. Cities as components of globalization, as unitary entities, and
3.Cities as a unified aggregate of groups.

Popular metaphors include the portrayal of a city as a concrete jungle, as a hybrid city, as a contested or divided city, as a person, or as a moving city. Metaphors vary in their degree of conventionality. Some are rather direct, like the 'soft and hard city'. Others are more poetic, such as "Cities are a never ending process, a constant fight between the oasis and the desert. They deployed geologic, a sort of 'theatre of rise and fall.' Rem KoolhaassaidonDubai"theultimatetabularasaonwhichnewidentitiescanbe inscribed."There is a wide and creative variety of metaphors to depict and understand city phenomena. (Solesbury, 2013) Suggests "The way we think about cities is strongly shaped by metaphors. Five recur in many variations: the city as a community, as marketplace, as a battle ground, as machine and as organism. These are extended metaphors, that is, they serve to structure the whole concept of the city with many dimensions and levels of meaning".

Urban design for city center, instead of imitating another format image of the city or inject large master plan, using various available tools is more suitably thought of as a process of arranging catalytic reactions that flexible to changes and urgency. Urban catalyst offers modest vision, but impact should be substantial and integrates existing

urban fabric. According to Attoe and Logan urban catalysis as an original concept was defined into 8 characteristics as following;

(1)how a new element modifies the elements around it.

(2) How existing elements are enhanced or transformed in positive ways.

(3) How the catalytic reaction does not damage its context.

(4) How a positive catalytic reaction requires an understanding of the context.

(5) Defines that not all catalytic reactions are the same.

(6) Presents that catalytic design is strategic.

(7) A product better than the sum of the ingredients.

(8)The catalyst can remain identifiable.

The above characteristics were firstly introduced in the Book of "American Urban Architecture: catalysts in the design of cities", after investigating downtown revitalization projects in many cities USA, in particular Grand Avenue shopping center in the city of Milwaukee.

Through a comparative study of ten (10) case examples for the need of this research, all above elements were found in the selected projects. In this case the state of urban catalysis was not only confirmed but also shows how this strategy provides chain reaction results in urban development. Urban Catalysis can serve as a new model that can either evolve or redefine the below existing models, by perceiving the catalyst with the common notion it serves in the field of chemistry, we can apply the same strategy to speed, improve, organize and develop the city similar to how a chemical reaction takes place. In this case the use of this metaphor can clarify better how a certain action in urban development can impact strategically the development of economy in social, cultural, architectural and urban design level.

Classification Of Catalysts And Projects

According to Attoe and Logan the catalysis involves the introduction of one ingredient to modify others. In the process, the catalyst sometimes remains intact and sometimes is modified alone. Adapted to describe the urban design process, catalysts may be characterized as follows:

1. The introduction of a new element (the catalyst) causes a reaction that modifies existing elements in an area. Although most often thought of as economic (investments beget investments), catalysts can also be social, legal, political, or—and this is our point—architectural. The potential of a building to influence other buildings, to lead urban design, is enormous.

2. Existing urban elements of value are *enhanced or transformed* in positive ways. The new need not obliterate or devalue the old but can redeem it.

3. The catalytic reaction is contained; it does not damage its context. To unleash a force is not enough. Its impact must be channelled.

4. To ensure a positive, desired, predictable catalytic reaction, the ingredients must be considered, understood, and accepted. (Note the paradox: a comprehensive understanding is needed to produce a good limited effect.) Cities differ; urban design cannot assume uniformity.

5. The chemistry of all catalytic reactions is not predetermined; no single formula can be specified for all circumstances.

6. A catalytic design is strategic. Change occurs not from simple intervention but through careful calculation to influence future urban form step by step. (Again, a paradox: no one recipe for successful urban catalysis exists; yet each catalytic reaction needs a strategic recipe.)

7. A product better than the sum of the ingredients is the goal of each catalytic reaction. Instead of a city of isolated pieces, imagine a city of wholes.

8. The catalyst need not be consumed in the process but can remain identifiable. ***Its identity need not be sacrificed*** when it becomes part of a larger whole. The persistence of individual identities—many owners, occupants, and architects—enriches the city(Attoe, W., Logan, D., 1989)

Cases are divided in two groups according to persistency of project as permanent and temporary. Permanent element covers on building and construction. Temporary element means setting or usage in the moment of specified time.

(1)Permanent cases: Although, impact of each project contributes an increasing of users and magnetize an investment, they also have other role in particular. For example, multipurpose building and sport facilities with metaphor of catalyst distinctive architecture serves as a landmark that can improve image of the area. However, all of cases are not imply to be urban catalyst.

(2)Temporary cases: Most of cases are traditional and contemporary events, which are held annually. Commercial, art and music events are held occasional. Temporary setting or installation can be divided to three cases including street vendors, Yantai (food stall) that appear at night; and container design project as pilot project. Although temporary cases can attract people, improve local bene t and catalyze social integration, impact on urban fabric change or surrounding improvements still lack of evidences. (Kongosombat, 2012)

In order to successfully use the above model that provides a series of catalytic reactions it is necessary to understand all available tools of urban development and design. In this case we must comprehend economic, social, cultural and design capabilities that different territories can offer and come up with tailor made strategies in order to provide urban regeneration and development. For urban catalysis to happen we must provide of catalytic strategies that don't offer only single case solutions but can serve as the initiator of an urban reaction in the city, generating economy, improving public space and responding to social life and culture of the city. The following architectural projects are investigating the case of permanent in Tervations chosen because each of them has a strategic role in the local area, in which they are located: and because they seem to meet the challenges facing the local are or the city. They however are chosen also because each one of them holds architectural qualities, which we find interesting to study and learn from.

Architecture as a Catalyst

In the case analyses, emphasis is placed on a combination of the above considerations about architecture as a catalyst. This includes the projects' location in the built environment, architecture in the transition zone. It also includes very concrete descriptions of architecture as structure that is architecture as physical structure and

typology. Secondly, it includes architecture as relations. That is architecture as programs and in use. A very important approach to architecture is the bodily presence in the architectural piece that is architecture as aesthetic and as experience. In the cases, the idea and the architectural narrative are presented. There will not be systemic analysis of signage and symbol meanings, but the topic will be enlightened through the approaches to the analysis and description of the architectural projects can be summarized in the following five themes:

- Architecture in transition zones (near district, the district's edge or in a public area
- Architecture that opens and changes the district's structure and creates transparency
- Architecture's programmatic diversity
- Architecture's aesthetic effects and structure
- Architecture narratives.

The emphasis in the case studies is on the analysis of architectural projects where place forms the context with which architectural projects interact and which they in turn influence. The cases analyze how and to what extent architectural projects give rise changes in the built environments. The cases assess in which way architectural projects seem to change social practice. While not all the cases are analyzed in depth, but still social practice is examined in depth whenever possible. It is observed who uses the sites and how the site is used, and other important analysis is which is the new condition of the site or the previous one regarding the social and cultural exchange or the spatial interactions that might have been drawn.

Table 1.Table of the Case studies, classified according to the impact and the typology of the catalyst

PROJECT/THEME	LOCATION	ARCHITECTURE	PROGRAM	AESTHETIC EFFECTS	ARCHITECTURAL NARRATIVE
	Within enclaves Between Enclaves Public Area Private Area	Form Scale Accessibility	Single minded Open minded Serial Folded Layered	Transparency Relational Visual Effects Bodily related aesthetic effects	Historical Monument Coexistence and Community Civility and Cultural Education
Bilbao Guggenheim Musem, Bilbao	At the edge of an enclave Public Area	Sculptural form Explodes scale of build structures Publically accessible	Open minded Layered Serially organized	Large degree of transparency Relational Visual Effects Bodily related aesthetic effects	Civility and Cultural education - icon of a common culture
Central Station, Arnhem	Between enclaves Public Area	Horizontal band Explodes scale of green parks in the area Publically accessible	Open minded Layered Serially organized	Large degree of transparency Visual connection between the city Bodily related aesthetic effects	Civility and Cultural education - icon of a common culture
Superkilen, Copenhagen	Through several neighborhoods Public Area	Horizontal band Explodes scale of green parks in the area Publically accessible	Open minded Serially organized	Large degree of transparency Relational installations Bodily related aesthetic effects	Coexistence and Community-bridging different cultures
Parc de la Villette, Paris	Between enclaves Public Area	Horizontal band Explodes scale of green parks in the area Publically accessible	Open minded Layered organized	Large degree of transparency to the city Relational installations Bodily related aesthetic effects	Civility and Cultural education Narrates the park as the city's state
High Line, New York	Through several neighborhoods Public Area	Raised horizontal ribbon Explodes scale of green parks in the area Publically accessible	Open minded Serially organized	Large degree of transparency to the city Strong visual aesthetic means Bodily related aesthetic effects	Historical monument-staging natural and cultural hertage as a narrative
Beurstraverse "Koopgoot", Rotterdam	Between enclaves- located between train tracks, parking and office buildings	Horizontal band on ground floor Adapts to building scale Publically accessible	Open minded Layered Serially organized	Large degree of transparency Visual aesthetic means	Civility and Cultural education - icon of a common culture Economical Focal Point
Markthaal, Rotterdam	Between enclaves- located between train tracks, parking and office buildings	Horizontal band on underground floor Adapts to building scale Publically accessible	Open minded Layered Serially organized	Large degree of transparency Bodily related aesthetic effects Visual aesthetic means	Coexistence and Community Civility and Cultural education - icon Economical Focal Point
"Madrid RIO", Madrid	At the edge of neighborhoods Public Area	Horizontal band on underground floor Adapts to building scale Publically accessible	Open minded Serially organized	Large degree of transparency to the city Strong visual aesthetic means	Civility and Cultural education Narrates the park as the city's state
Euralille Masterplan, Lille	Throughout the city Public Area Private Area	A vertical structure Adapts to building scale Publically accessible	Open minded Layered organized	Large degree of transparency to the city Bodily related aesthetic effects	Coexistence and Community-bridging different cultures
Opera House, Oslo	Between enclaves- located between harbor, parking and office buildings	Sculptural form Explodes scale of build structures Publically accessible	Open minded Layered organized	Large degree of transparency to the city Bodily related aesthetic effects	Coexistence and Community Civility and Cultural education - icon of a common culture

General considerations and conclusions

Defining a special relationship between architecture and place, by introducing some of the theoretical positions that are part of our understanding of architecture and place, understood as relationship between architecture and awareness. It includes architectures ability to affect the physical dynamics of change in the built environment: similarly, it includes both architecture in use, as an experienced structure as well as the impact it may have one change in behavior and perception of place. From the cases studies analyzed on the previous chapters, we introduce the concept of the catalyst as nor as a consistence

concept neither as a established idea but as framework to transform both physical and social environments. In following we will touch the three important concepts: catalyst, architecture and place as the most important ingredients for this transformative process.

The role of the catalyst as a facilitating agent

The concept of the catalyst as analyzed as a metaphor, similar to how it operates in chemistry. Similar to how a substance may act catalytically, in the same way it implies that it can promote a chemical process or speed up this process without itself being transformed or consumed by the reaction. A catalyst is therefore a facilitating agent, a teammate, but it is neither a chemical reactant nor a part of the subsequent chemical result. A catalyst allows for substances that otherwise would have reacted, to react with each other. In a figurative sense, the term is also used for a person who stimulates a particular development: a coach of a football team or a mental coach, for example. Changes in societal discourse can also act as a catalyst for a particular development.

Catalyst as a Tool and Strategy

An important feature of urban catalysis, as we have seen, is that it is located at the edge of the process. Defining whether architecture that is serving as catalyst of urban development has a corresponding position located in the transition zone between different enclaves of the built environment or in a more figurative sense between different social groups and cultures. The use of urban catalysis can provide an alternative model of urban development, in a capital oriented urban development society, where the old models of urban design and architecture have failed to provide adequate solutions to topics that concern the development of our cities. The case studies of this research have showcases how in several contexts where social and economic difficulties were not making possible the implementation of new activities which could provide urban regeneration. In these case urban catalysis as a new and alternative process of urban development was essential to provide solutions offering an archive of best practice projects and a toolkit which could be adapted accordingly. It is important to highlight that in this case the success of the catalyst is not only based in the formal and functional appeal of a single project, or the will of the local and central government to make the project work. The process basis its success on the synergy which is created between stakeholders, private and public, architects, urban planners, governmental bodies and citizens which want to achieve mutual benefit throughout the regeneration of a specific public space. In this case developing an information and resources pool is fundamental to understand common goals and difficulties in order to realize a certain strategy. Urban catalysis is strategic because it is not dependent on single actions no matter how important or big they can be considered but in a long-term plan which is able to be implemented and to re-structure itself in relation to context, economy, social appeal and acceptance.

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