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Urbanization is rapidly increasing in the poorest countries around the world. Widespread poverty, inadequate infrastructure and substandard living conditions are prevalent throughout developing cities. Despite continued urban development and economic expansion, social and economic inequalities are worsening. Research has yielded that the current model for urbanization creates these socioeconomic issues through the erosion of cultural identity as it attempts to contemporize. Developing cities will suffer through an extended period of urban decline until completely generic. In other words, these conditions will worsen before they can start to improve. This urban crisis has prompted the proposal of a new urban model that promotes an incremental yet continual improvement of urban life for the indigenous population.

The Genetic City theorizes that developing cities can avoid this period of urban decline through an architectural rebalancing of economic and cultural factors. This equilibrium is achieved through a master program organized by an architectural framework that engenders the continual adaptation and evolution of a culture. The Genetic City argues that urbanization through cultural evolution will lead to an enriched urban society.

The formulation of this theory was developed first and foremost through the study of the current urbanization method and its effects on Metro Manila. This investigation is a departure from the writing of Rem Koolhaas and his study on the generic model. His work provided insight that led to the discovery of economic influence on developing cities and aided in defining urban threats. The theory further expanded through research of past utopian urban models, revealing a focal shift from utilitarianism to an identity-based ideology. This ideology served as the basis for the master program and framework proposed by The Genetic City.
In the attempt to contemporize developing cities, the current urbanization model erases cultural identity resulting in a period of urban decline. This path leads to an urban dystopia: a future of consumer culture manifested through the dominance of economic influence. The Genetic City avoids this dystopia through an architectural rebalancing of economic and cultural factors to promote cultural evolution towards an innovative society.
INTRODUCTION

The Genetic City is a response to the growing urban crisis. Currently, more than half of the world’s population is living in an urban area. The United Nations reports that 90% of urbanization is happening in countries throughout Asia and Africa. By 2030, the urban population in developing countries will increase twenty times more than developed countries. This prediction means that 76% of the world’s urban population will be living in developing countries with more than 1 billion people living without adequate shelter and access to basic services.

Despite their varying cultures, urbanizing populations of developing countries will be met with a city based on a singular culture -- westernization is the leading method for globalization. This urban model necessitates that the indigenous people abandon their current way of life and conform to the city or find themselves alienated in their own land. As a result, informal settlements continue to grow throughout urban areas of developing countries and local culture is continually marginalized.

This urbanization forecast calls into question the current model for urban development. Urban theorist Rem Koolhaas described this model as a method of genericity, characterized by the erosion of identity, with Singapore as the prime example.

Developing countries continue to urbanize based on this idea of genericity in hopes of improving economic relationships with foreign countries; however, it creates a city based on an economic model that locals are unable to integrate with. The urban crisis, therefore, is the growing population of the urban poor and their inability to break out of the poverty cycle due to the current urban development model.

The Genetic City explores the possibility of a new urban model based on local culture and focuses on the area of Metro Manila, Philippines to develop and test this model.

2 2018 Revision of World Urbanization Prospects May 16 2018 United Nations Department of Economic and Social Affairs
3 Calculation based on world population projection of 8.5 billion in 2030. 2017 Report United Nations World Population Prospects
4 The Generic City 1994 Rem Koolhaas
5 Singapore Sanglines 1995 Rem Koolhaas
6 2030 World Population Projection By Author
2030 WORLD POPULATION PROJECTION

- URBAN - DEVELOPED
- RURAL
- URBAN - DEVELOPING
- URBAN - SLUMS
LEARNING FROM METRO MANILA

The National Capital Region (NCR) of the Philippines, better known as Metro Manila, is an area of 239 square miles, organized into 16 cities and 1 municipality. Based on their national metric, all the cities of Metro Manila are considered highly urbanized, constituting nearly half of all urbanized areas in the entire country. Metro Manila provides necessary conditions to demonstrate the effects of the current urban model and the threats other developing countries face if no action is taken.

In 2008, the country was urbanizing at a rate of 3%¹, fueled by an economic expansion rate of 7.3%². At the time, Metro Manila’s population was 1.6 million.³ Ten years later, Metro Manila is populated by more than 12 million people but is under immense pressure from the urban agglomeration population of 24 million, making it one of the most densely populated cities in the world. Despite tremendous growth, the Philippines is still categorized as a developing country⁴ plagued with high levels of poverty and an overburdened infrastructure.

Today, several developing countries are in a similar position, poised for massive growth and at risk of an urban dystopian future. These countries exhibit urbanization rates higher than the rates of Metro Manila in 2008 but with lower economic expansion rates. In other words, the urban population of these countries is growing faster than Metro Manila but with less financial means. Based on this observation, Metro Manila provides lessons for other developing cities throughout Asia and Africa.

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¹ Population of at least 200,000 with an annual income of 500,000 Pesos (roughly $1M USD)
² Philippine Statistics Authority
³ Metro Manila constitutes 16 out of 33 highly urbanized cities throughout the country
⁴ Philippine Statistics Authority
⁵ The World Factbook 2009
⁶ US Central Intelligence Agency
⁷ Economic Report February 2009
⁸ Philippine Senate Economic Planning Office
⁹ 2007 Census
¹⁰ Philippine Statistics Authority
¹¹ 2017-2018 Country Classifications
¹² World Bank
¹³ Poverty Cycle Diagram
¹⁴ By Author
THE GENETIC CITY

WITHOUT MONEY

WITHOUT PLACE

POVERTY CYCLE

WITHOUT JOB
<table>
<thead>
<tr>
<th>Country</th>
<th>Urbanization Rate %</th>
<th>Economic Expansion %</th>
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</thead>
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<tr>
<td>Philippines</td>
<td>3.00</td>
<td>7.3</td>
</tr>
<tr>
<td>Uganda</td>
<td>5.70</td>
<td>6.0</td>
</tr>
<tr>
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<td>5.68</td>
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<tr>
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<td>4.86</td>
<td>5.1</td>
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<td>Ethiopia</td>
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<td>Madagascar</td>
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<td>Bahrain</td>
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</table>
THE EFFECTS OF WESTERNIZATION

To better understand the effects of westernization and the estrangement of the indigenous population, Rem Koolhaas provides an investigation that catalogs key attributes of the generic model. Conducted in 1994, the point of reference for Koolhaas at that time were cities that had developed between the 1960s through the 1990s, namely the city-state Singapore. Using Koolhaas’ catalog as a lens for the study of Metro Manila reveals long term effects of conflict between westernization and local culture on urban development.

CORPORATE INFLUENCE

Historically, cities grew as long as the benefits continued to outweigh the costs. Because of this relationship, cities pander to economic forces, engendering influence of corporate interests on urbanization. For developing countries, these economic forces are of foreign origin.

Koolhaas described this relationship through an observation between hotels and history. In the implementation of a global economic plan, the hotel is the “most common building block” and history is expendable. As a result: “hotels are constructed...in direct proportion to the erasure of the past.” In other words, urban development becomes a reflection of economic pursuit. What we are seeing at present is urban growth under corporate influence.

Metro Manila’s economy demonstrates this influence. As cities further develop, there is a natural shift from agricultural production to a focus on the industrial and service sectors. Metro Manila is no exception. As the country saw a shift from agricultural production, there was an increase in the service sector due to the growing industry of Business Process Outsourcing (BPO) in Metro Manila. The BPO industry is composed of several sub-sectors such as data processing, software development and call centers and is largely fueled by foreign companies.

From 2000 to 2010, the BPO industry’s contribution to the GDP grew from $60 million to $8.9 billion. In 2016, the amount more than doubled to $22.9 billion. By 2020 it is projected that revenue will increase to $55 billion and become the single largest contributor to GDP. In other words, Metro Manila - home of all major BPO companies in the country - is a pillar to the Philippines economy.

The effect of this industry on Metro Manila’s urbanization is profound. In 1995, the Philippines Congress passed the Special Economic Zone Act to promote foreign investment. The original zones identified in the act were all provincial areas aimed...
towards the industrial sector. When it became clear that the BPO industry was such a robust sector, the act was amended so that even a single floor of a building could apply to become a special economic zone. This amendment aimed to accommodate and attract BPO companies to establish offices in Metro Manila.

This catering to foreign multinational companies has led to the development of six business districts in Metro Manila, all competing to attract BPO companies. As of March 2018, these business districts were adding over 6.6 million square feet of office space. In the same year, New York is adding nearly the same amount of office space but has an economy seven times larger, demonstrating the impact of corporate interests on the urbanization of Metro Manila.

Of the six business districts in Metro Manila, the three largest are Bonifacio Global City, Makati and Ortigas. These areas continue to over develop, pushing the indigenous population to the outskirts in favor of retail and office space for global companies.

**URBAN DECLINE**

According to Koolhaas, the generic model operates based on the theory of Tabula Rasa. If there was nothing, now they are there. If there was something, they have replaced it. In other words, the two main functions of the generic model are erase and rebuild; however, the acts of erasing and rebuilding are two events separated by an extended amount of time. This interval is the period of urban decline.

During this span, social and economic inequalities increase. This reality is demonstrated through the growth pattern of the generic model. Newly developed areas expand concentrically, forming a concentration of the old in the peripheral. The city becomes a physical representation of the divide between social and economic classes - an expanse of office and retail space surrounded by overly dense informal settlements. The development of Bonifacio Global City illustrates that the majority of the population is left with the minimal amount of space. In that respect, the period of urban decline is characterized by the over development for foreigners and the under development for the indigenous population. This under development is also depicted by the infrastructure of Metro Manila and the makeshift public transportation system.

The underdevelopment of the public transportation system stems from the competitive nature between business districts. As private development operates
without governance or coordination, the interstitial areas between business districts remains ignored. The result is an underdeveloped and overburdened infrastructure that is ranked third in worst traffic throughout Asia. On average, people spend 66 minutes in traffic and 24 minutes searching for parking. Without traffic, it is possible to traverse the entire length of Metro Manila in under 30 minutes. Because the existing rail system fails to connect most of the city, people turn to unorthodox methods of public transportation: the jeepney and tricycle.

The jeepney is an open air vehicle known for its kitsch artwork and loud music. The jeep frame, left over by American troops after WWII, is extended to form the jeepney cab and can hold as many as 30 passengers. Intended as an affordable mode of public transportation, they are often in poor condition constructed with improvised parts. Because driver earnings are based on the number of fares collected, jeepneys create a very competitive nature on the road. Drivers weave through traffic without regard for anything else, stopping anywhere and anytime to service passengers.

The other method of public transportation is the tricycle. Tricycles are motorcycles with a sidecar attached. Passengers can hire tricycles in the same manner as a taxi but local restrictions limit their destinations.

Working in tandem, tricycles and jeepneys form an unorthodox network of public transportation. A typical commute for the working class starts with a tricycle ride to a location along a jeepney route. Intersections of Jeepney routes allow commuters to transfer jeepneys until they reach their final destination. The length of the commute is described by the number of rides required to reach a destination.

Despite the dangerous nature of jeepneys and tricycles, a majority of the working class would remain unserved without them. Makeshift solutions such as these are an example of hardships that the indigenous population face during the period of urban decline. These hardships will not improve until the phase of tabula rasa is over - when local culture is completely erased.

CONSUMER CULTURE

The eradication of local culture has led to the rise of a consumer culture, demonstrated by the evolution of the mall typology in Metro Manila. Unlike their predecessors, these mutated malls are not just for shopping. The generic model has transformed the mall into a site for utilitarian and social activity, commercializing all aspects of urban life. Eventually, the mall will replace the plaza - the only place intended for people to gather.
As a result, shopping will be an inescapable confrontation of urban society leading to a strong consumer culture.

In his study of the generic model, Koolhaas noted that "shopping is the only activity." To mitigate the inevitable dominance of shopping and the effects on culture, he recommended that shopping be considered provisional and ideally incorporated with "libraries, baths [and] universities." By prescribing institutions of higher education and social sophistication, Koolhaas suggests that malls could be used as a catalyst for advancing urban civilization; however, corporate interests have prevented that outcome. Instead, malls are anchored by utilitarian program such as grocery stores or public transportation terminals. The larger the utilitarian anchor, the more enticing the social and utilitarian amenities, leading to a variety of mall types. These mall types fill the urban landscape, allowing consumer culture to infiltrate all aspects of urban life.

Metro Manila demonstrates this infiltration with over 211 malls organized into 6 different types. These types range from community malls - anchored by grocery stores - to major shopping malls that offer services such as public transportation or host government satellite offices. One of the more compelling anchors for major shopping malls was the integration of the Catholic church. With 89.6% of the population in Metro Manila identifying as Catholic, Sundays have become the busiest day for the mall where families can eat, pray and shop.

However, the aspect that solidified the mall as the contemporary plaza was the inclusion of large green space in place of public parks. These faux parks require no obligation to shop, allowing people to visit malls freely and frequently. This feature of the mall encourages social activity while also increasing foot traffic for retailers. The lack of actual parks in Metro Manila leave mall parks the only option for outdoor gathering. In that sense, malls resemble the historic market place next to the plaza. Once a neutral space for social life, the plaza has become weaponized for commercial gain.

The inclusion of social and utilitarian program has led to some of the largest structures in Asia and has positioned the mall as the core to urbanization. Koolhaas foresaw the potential of the mall as a place for sophisticated urban activity, however, instead of being leveraged as a tool for advancement, the mall has led to the infiltration of shopping in all aspects of urban life. As a result, the population will become engrossed in consumer culture through the continued implementation of the generic model.
The study of Metro Manila revealed the negative impact resulting from the conflict between local culture and western urban development. These adverse effects are further characterized by an imbalance between economic and cultural factors. The shortcomings of the current generic model can be traced back to the ideas presented by the International Congress of Modern Architecture (CIAM).

CIAM

The Athens Charter

The organization's fourth conference, titled The Functional City, focused on establishing urbanistic ideas that would later be synthesized into a document known as The Athens Charter.

The namesake of The Functional City is based on the idea of organizing the city into four functional zones: habitation, leisure, work, and traffic. Despite the best intentions, The Athens Charter has "become synonymous with a technocratic, profit-oriented and inhumane form of urban development." This criticism reflects the sentiments of the charter regarding economic influence. Architecture's true program "demands a close liaison between architecture and the general economy." The emphasis on economy led to a highly utilitarian urban model, characterized by rigid functional zoning. This rigidity is demonstrated by Le Corbusier's proposal The Radiant City.

1. CIAM 4 and the - Unanimous Origins of Modernist Urban Planning ArchDaily
   Daniel Weiss, Gregor Harbusch and Bruno Maurer

2. First Congress / The Declaration of La Sarraz The Athens Charter
   Opposite Page Requirements excerpted from The Athens Charter
   Original Radiant City Diagram Le Corbusier
   Recreation and analysis of The Radiant City By Author
The business city must be assured of good communications with the residential quarters.

Traffic at high density intersections will be dispersed in an uninterrupted flow.

The new green areas must serve clearly defined purposes, namely to contain buildings for community use.

The alignment of dwellings along transportation routes must be prohibited.

Residential districts must occupy the best locations.

Every residential district must include the green area necessary for children, adolescents, and adults.

High buildings set far apart from one another.

The industrial area must be independent of the residential areas, and separated by a zone of vegetation.

THE RADIANT CITY
HOUSING BLOCK
THE RADIANT CITY
THE RADIANT CITY

Perhaps the most compelling aspect of The Radiant City is the proposed housing block designed by Le Corbusier. The central location and irregular footprint satisfy several key points outlined in The Athens Charter, namely the mandate requiring the best location for housing and sun exposure for each dwelling, respectively. The form of the housing block also provides opportunities for leisure activity specified in the charter.

However, strong economic influence is evident in the linear organization of the functional zones in The Radiant City. Despite the recognition of economical, political and social forces identified in The Athens Charter, there is a lack of social interplay between the zones that enriches urban life. The lack of social consideration is further demonstrated by the use of green space in Corbusier's proposal. Zones of vegetation are used as devices to divide the functional zoning, missing the opportunity to provide places of gathering instead. The misuse of greenery reiterates the lack of social consideration and alludes to ideas of disconnect.

This disconnection is apparent in two ways: the lack of relationship between housing and site and the lack of human scale among the massive structures. Megablocks filled with long strips of dense housing impose a sense of domination over the landscape and the dwellers. The megascale thwarts any possibility of people making meaningful connections with the landscape or amongst themselves, the potential for identity is diminished. Life is compartmentalized into sterile zones.

This sterility is perceptible in the symmetry of The Radiant City. The long vertical axis that divides the city into two equal halves is reinforces the rigid utilitarianism of the proposal. This observation is in fact part of the criticism that characterizes The Radiant City as profit-oriented and inhumane. Criticism of The Radiant City would eventually lead to the dissolution of CIAM and the formation of Team 10, a group of ten architects that aimed to rectify the shortcomings of The Athens Charter by introducing ideas of human association.
TEAM 10

Team 10 Primer

Criticism of The Athens Charter had led to the formation of a small subgroup within CIAM. This group of architects would later branch off and form their own organization under the moniker Team 10 and with it a publication titled Team 10 Primer. The primer is organized into three parts - Urban infra-structure, Grouping of dwellings and Doorstep - and introduced ideas that directly challenged The Athens Charter. Among these ideas is the ‘hierarchy of human associations’ that aimed to rectify the ‘most obvious failure, the lack of comprehensibility and identity in big cities.”

HIERARCHY OF HUMAN ASSOCIATIONS

The Street
A physical contact community

The District
An acquaintance community

The City
An intellectual contact community

Despite the names, these various levels of association are representative of abstract ideas that require new forms of association. Therefore, the aim for Team 10 was to establish clarity amongst these levels while challenging the rigid organization proposed by The Athens Charter. This effort is demonstrated in the Cluster City - an idea that uses the road system as a basis for community structure. This shift in ideology from The Athens Charter to the Team 10 Primer marks the growing importance of identity in urbanization that The Genetic City continues to develop.
Appreciated unit - part of the human agglomeration - able to change over time

Road network - only fixed thing - can be deliberately routed and the land beside them neutralized

CLUSTER CITY DIAGRAM
CLUSTER CITY

Alison and Peter Smithson, members of Team 10, proposed Cluster City in an effort to define form for the levels of human association and ultimately give identity to urban areas. These areas, known as clusters, give form to The District and are organized through patterns of association, distinguishing each district by function - office district, factory district, etc. The agglomeration of these districts give form to The City.

The diagram of Cluster City illustrates that these districts are similar to the functional zones of The Radiant City but ordered in a non-linear fashion. Instead, Cluster City is organized around the river - working zones above the river and residential zones below it. Large scale natural elements and roads are considered to be the only fixed components and serve as points of local identity.

This local identity is further reinforced through the introduction of mobility. The Smithsons argue that complex associations and social cohesion could only be achieved through ease of movement. This ease of movement is achieved through streets-in-the-air and define form for The Street in human associations. This idea would be further clarified through the Golden Lane Deck Housing Project, a social housing proposal that proposed streets as an extension of the house. Despite never being realized, the Smithsons publicized the proposal in an effort to spread their ideas. Their publication aimed to illustrate the modulated continuum established by the housing cluster and streets-in-the-air. This idea of the continuum challenged the rigidity promoted by The Radiant City and argued for identity and mobility through urbanization.

Despite their movement towards identity and mobility, other notable architects could not fully commit to the ideology of Team 10 due to the lack of cultural and historical recognition. Japanese architect Kenzo Tange would later express similar concerns and advocate for the incorporation of tradition in architecture. This idea would lead to Japanese modernism and serve as the foundation to the urban movement of Metabolism.
METABOLISTS

During the formation of Team 10, Japanese architect Kenzo Tange declined membership because “he could neither completely lose touch with the ideas of ‘old’ CIAM nor absolutely identify himself with the new ideas of Team X.” Upon his departure, Tange lettered that the ideology of Team 10 failed to establish contemporary social patterns because of their passive acceptance of social change. Despite its inevitability, Tange argues that growth pattern is not a theory but rather an observation. His argument suggests that in order to develop contemporary ideas, they must continue to develop through an observation from past to present. So while Tange agreed with the notion of growth and change proposed by Team 10, he also felt an obligation towards tradition. Furthermore, Tange could not let go of CIAM’s ideas of functionalism. Consequently, he assimilated functionalism together with tradition to form Japanese modernism.

Tange’s philosophy of Japanese modernism would eventually serve as the ground work for the architectural movement known as Metabolism. Unlike CIAM and Team 10, Tange and the future Metabolists saw “no conflict in their simultaneous study of tradition and modernism.” The group further distinguished themselves by avoiding a “unifying blanket statement.” This freedom of idea led to independent investigations that would later be published in the self titled manifesto Metabolism.

**Metabolism Manifesto**

Organized into four parts, the manifesto proposed projects that encouraged active metabolic development rather than a natural one. The first two investigations into metabolic development, *Ocean City* and *Space City*, were techno-utopian proposals while the third part, *Towards the Group Form*, was focused on urban planning. *Group Form* was an idea established by Fumihiko Maki and Masato Ohtaka that aimed at accommodating physical and social growth through flexible urban planning. Maki continued to develop this idea and would later propose the idea of “Master Program” (as opposed to a master plan) in the follow up essay *Investigations in Collective Form*.

**Investigations in Collective Form**

In his essay, Maki argues that urban society is a dynamic field of interrelated forces that can be ordered into a dynamic equilibrium. However, because this equilibrium will change over time, the notion of a fixed master ‘plan’ will always fall short because of the inability to adapt. In order to cope with this change, Maki offers the idea of a master program that allows for a flexible ordering system to maintain dynamic equilibrium. However, the conundrum that Maki points...
out is that in order to develop a master program, architects and urban planners need a ‘master form’, which had not been established. In order to find this master form, Maki explains that we must look beyond the single building and study the collective form - the meaningful collection of buildings.

In his investigation, Maki defines three approaches to analyze collective form: Compositional Form, Megastructure, and Group Form. For The Genetic City, the idea of Group Form is promising because it advocates for the ‘sequential development of basic elements.’ Compared to the Megastructure, Group Form does not require a large structural skeleton. This freedom from fixed structural members allows for the incremental installment of new buildings that fall within the dynamic ordering system. Maki tests this idea in a project titled Hillside Terrace.
COMPOSITIONAL FORM

MEGASTRUCTURE

GROUP FORM
HILLSIDE TERRACE

Hillside Terrace is a successful illustration of Group Form implemented in an existing urban fabric. Over a span of 23 years, Hillside Terrace developed incrementally through six phases. The cohesion and identity of each phase was achieved through a set of factors established by Maki. These guiding factors allowed Maki to meet the demands of the expanding urban area while maintaining the dynamic equilibrium of urban society.

Among these factors, developing cities can benefit the most from the idea of sequential development. Hillside Terrace demonstrates small scale urbanization over an extended period of time, a concept that can be used to mitigate risks of urban decline in developing cities. Furthermore, Group Form establishes a method for maintaining a consistent identity during the development process through a use of consistent materials and repeating elements. This method of spatial language allows for flexibility through slight variations in the aesthetic. This flexibility is key in maintaining a dynamic equilibrium.

The key issue moving forward is a matter of implementation in developing cities. Maki notes that the development of Group Form requires participation from city and society. The limitation of Group Form is that it requires large parcels of land to be set aside for several years. This requirement is challenging for developing cities undergoing rapid urbanization and puts into question Maki's notion of master program versus master plan. In other words, the city must have a master plan in place to implement Group Forms.

In that sense, Hillside Terrace provides a lesson in implementation to The Genetic City. In order to develop meaningful arrangements of buildings and thus play a role in cultural identity, The Genetic City must first and foremost establish an ordering system to safeguard land use against economic influence. Furthermore, this system must provide elasticity for the sake of cultural evolution. Through this flexible framework, The Genetic City can maintain socioeconomic equilibrium and avoid urban decline in developing cities.
HILLSIDE TERRACE: FOUR FACTORS OF GROUP FORM

CONSISTENT MATERIAL

HUMAN SCALE

OPEN SPACE

SEQUENTIAL DEVELOPMENT
Past attempts at promoting identity in urbanization has revealed an important trend in building arrangement. The Smithsons referred to it as the Cluster while Maki called it Group Form. The cluster advocated for the grouping of similar programmatic elements - the office cluster or the housing cluster - while Group Form mixed different programmatic elements and united them with similar aesthetics. Each approach, though fundamentally unique, had a common goal - to establish an urban setting for identity through the thoughtful groupings of buildings.

The Genetic City builds off these ideas by putting forward a master program for these groupings of buildings and organizes them through an architectural framework.

CITY AS ORGANISM

The city is a living organism that grows and evolves. Like all organisms, the city consists of molecules, the urban block, that separate building area and roadway. Molecules are formed by groups of atoms bonded together. In urban development, these atoms are buildings with a particular purpose architecturally known as programmatic elements. These programmatic elements can be bonded in a variety of ways to form unique molecules.

Imposing a static plan on programmatic elements limits the growth of the molecule and thus the evolution of the organism. In other words, to promote cultural evolution in urban development, there is no place for the master plan. Instead, the Genetic City puts forward a master program -- a set of defined programmatic elements that engenders the progression of local culture. Directing the growth of the city starts at the atomic level.

MASTER PROGRAM

The master program must be defined based on the culture of the local population. By understanding human activity, buildings of important programmatic value can be identified. In the case of Metro Manila, the master program came through an understanding of community organization and the daily activity of informal settlers.

Cities of Metro Manila are subdivided into Barangays -- the smallest governmental unit that is formed by communities. Within each barangay there are four buildings of cultural significance that can be found: the barangay hall, the sports complex, the church and the public school.

In order to provide a formal place for informal settlers and to ensure a means of breaking out of the poverty cycle, informal housing
EXAMPLE OF BARANGAY HIERARCHY
SPORTS COMPLEX
PUBLIC SCHOOL
CULTURAL LANDMARKS OF BARANGAY

BARANGAY HALL
The functions as the smallest government unit and community center for the local population.

CHURCH
More than 90% of the Filipino population is Catholic and attend mass services regularly.

SPORTS COMPLEX
Basketball is the country's favorite sport; however, these complexes also host other sports and civic events.

PUBLIC SCHOOL
Families of informal settlers send their children to public school while private schools are better equipped yet financially out of reach.
and the informal market must also be included as programmatic elements to the master program of Metro Manila. Lastly, these programmatic elements must be balanced with global economic goals, thus corporate commercial development is essential.

In summary, the programmatic elements for Metro Manila's master program are:

1) Cultural buildings of the barangay
2) Informal Housing
3) Informal Market
4) Commercial Development

As referenced before, the molecule is defined by a group of atoms bonded together. Therefore, it is necessary to define the bond between each programmatic element to form balanced molecules that will shape the city. The organization of these programmatic elements are defined by the Genetic Framework.

**GENETIC FRAMEWORK**

The Genetic Framework is the architectural arrangement of programmatic elements that ensure successful public spaces that connect each programmatic element to the next.

This framework begins by identifying the necessity of the cultural building as an anchor to the urban block. Therefore, genetic blocks must take place where a cultural building already exists. Duplicating or recreating a cultural building does not ensure a successful molecule because it does not carry with it the memory or sense of place that an existing cultural building does. This is not tabula rasa.

Next, commercial development is limited to the area adjacent to local and arterial roads and building height must be proportionate to road type and existing cultural building i.e. commercial development along arterial road equal to existing height of cultural building and along local road, one-half or two-thirds of the height of the existing cultural building. This limitation ensures that infrastructure is not overburdened with traffic while keeping the urban block to a familiar scale.

In addition to controlling commercial development scale, a permeable massing strategy must be used in commercial development. In other words, pedestrians must have direct access towards the center of the block without having to pass through the interior of a commercial building. These pedestrian pathways may also align with neighboring blocks, to further promote walkability and intermolecular connections.
INFORMAL HOUSING
INFORMAL MARKET
Pedestrian pathways that provide line of sight to the existing cultural building are an added bonus.

With regard to informal housing, Filipinos have demonstrated a resiliency and resourcefulness in the construction of their homes. This ingenuity is a necessity due to the shortage of formal public housing affordable to the urbanizing population. Therefore, the urban block must provide a structural grid for informal settlers to infill. Their are many important aspects to this grid that may require further discussion on as needed basis but below are thoughts in a Q and A format.

Q: Who would provide this grid?
A: One possible solution would be for commercial developers to construct the grid and lease it back to the local government in a public-private partnership. There are several economic models that allow for this such as Build-Lease-Transfer.

Q: What is the grid constructed with?
A: This grid can be considered semi-permanent and cost friendly. Therefore, a steel grid may be inappropriate. A timber grid may be economical for a number of reasons and can double as a pavilion below and housing on top.

Q: What are the dimensions of this grid?
A: This dimension will depend on the material and the construction method. Ideally, the grid is no smaller than 10' x 10'. Larger than 20' x 20' also seems unnecessary.

Aside from providing a structural grid, community facilities must also be provided to ensure success of the urban block. These facilities provide necessary sanitation and habitation requirements. Community bathrooms kitchens and living rooms should be provided at a minimum.

Lastly, informal markets must be in areas conducive to conducting business. This is most likely to happen within proximity of commercial development and pedestrian walkways. In doing so, this provides foot traffic to increase the likelihood of generating revenue and breaking the poverty cycle. This aspect of the Genetic Framework is essential because it ensures that local culture can evolve beyond the urban poor population from one generation to the next.

These parameters can be interpreted into a number of combinations which frame a variety of public spaces. It is important to define these spaces and be conscientious of their use and arrangement.
NEXT STEPS

As this thesis continues to develop, the next steps would be to define the aesthetic continuity of the urban block similar to Maki's guidelines for sequential development. These are the architectural details of the Genetic City that would reflect local culture similar to Greek, Roman and Gothic architecture. That is to say, a separate framework for scale, material, light, and other architectural details must be put in place so that a cultural aesthetic can be developed and utilized in the story telling of a culture.