The Cloud

Adaptable City

IIT Cloud Studio Abroad Fall 2016
Hosted by The Why Factory / Delft University of Technology

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From CIAM to Adaptable

Urban planning and architecture saw a revolution of during the XX Century as data and statistics started to have a stronger influence in the way the city was understood and envisioned. In a trends against romantic and formally driven responses the functionalist movement relied on mapping tools, demographic surveys, light and sun exposure. It did not stop in the improvement of buildings, the movement went all the way to the urban scale and defined the future policies regarding planning for most the century.

During most of the CIAM era the city was clearly divided in four areas: habitation, leisure, work and traffic. Bypassing the crisis of modern planning and the response of formal gestures of postmodernism, we encounter ourselves back to the point where we do have a hope on the power of understanding cities through science and technology. Yet the challenges that we encounter nowadays differ from those of modern planning, indeed we do need housing, work, leisure and traffic policies, but at the same time we need to be aware of how our footprint affects the planet, a scale not seen in the modern movement.

How much food and where is produced comes to the equation, what types of governances respond better to the current demands? What about animal species that were basically neglected from urban life for decades? How energy consumption defines what a city can be? As new concerns come to the table, designers of cities need to devise a method for confronting the ever increasing number of parameters that the city needs to address.
Why Adaptable?

In the past years, The Why Factory has explored a wide array of approaches to envision the role of the future city. These approaches have included a closer look at how to achieve maximum Biodiversity (Biodivercity), Maximum permeability (Porosity), Maximum connectivity (4minCity), Maximum automation (Robotic City), Maximum Villas Density (Vertical Village), Maximum Sustainability (Green Dream), Maximum Freedom (Anarcity), Maximum Self Sufficiency (Food City), Maximum Flexibility (Barba), Maximum customization (Egocity), Maximum Leisure (Absolute Leisure), Maximum Inventions (World Wonders). Each of this works has aimed to isolate each of these topics and work in depth on the potential effects of the future city.

For the first time in its short history The Why Factory is aiming to combine and confront the multiplicity of these topics and confront them to specific demands that require a quick answer: Adaptable City.

The Cloud is an invitation to look at the city through each of these lenses individually but also in combination with each other. The Cloud aims to develop design strategies and tools that could help the citizens to make the best decisions. The Cloud aims to minimize compromises and instead searches for creative ways to maximize several parameters simultaneously.

As a follow up of our research at The Why Factory, and in order to face the future challenges of our cities, we think that we need to go beyond a classical approach of analysis and design where theme isolation has become the standard method. The Cloud act thus simultaneously as a vision and as an evolving, open conceptual framework, composed of a network of interrelations between a collection of topics and aims to react to them quickly. It regroups aspects related to Intensity, Biodiversity, Utility, Agility, and Productivity.

The Cloud wants to focus on the conceptualization, modelling and maximization of an array of these crucial themes within its own
limited set of parameters to later confront these results with other points of view of alternative parameters and arrive at optimal results.

The question of The Cloud is no longer how to make an energy efficient city or a food self sufficient city, but how to work within complex sets of information and potentially contradicting paradigms in order to arrive to the best results with minimum compromises. So how can we design a city that is as DENSE, INTENSE, FERTILE, UTILE, AGILE and PRODUCTIVE as possible by using 9 lenses simultaneously: accessibility, food, leisure, biodiversity, production, density, health, governance & automation.

Each of its lenses will then have to respond to standard functional needs of its users such as light, position, scale, size. The lenses will then need to be tested within different levels of pressure demands such as higher or lower densities and be able to adapt through strategies that take into account time phasing, collaboration schemes, production revenues or size redefinition.

Finally each lens will be tested with different field of densities: low, mid and high. The building typologies will clearly differentiate between towers and blocks.

The Cloud studio asks: Can the Maximum City satisfy the housing desires of all its residents and still be accessible? Can Biodiversity coexist with a highly productive city? Can Food City be dense and intense as well? Can the Automated city address the desires of Egocity dwellers? These is the beginning of a long list of potentially conflicting agendas that we aim to solve in the studio.

The Cloud is interested in finding complex answers to these ques-
tions, we are interested in finding the limits of each theme and specially the conflicting lines between different priorities.

Why a Cloud?

The Cloud refers to the lightness and easiness in which the citizens can tune and direct their city on demand. In that sense the studio is more like an open software where new parameters could be later added and existing ones be able to be updated.

The Cloud is also a reference to a decision tool kit set. Can we imagine a tool that is able to keep track of the several themes affecting the city simultaneously? Can this tool help us to evaluate and compare a catalogue of interventions? Can this tool set the benchmarks where citizens can use as references for their design and performance strategies?

In short The Cloud acts as a conceptual framework regrouping a series of parameters and topics involved in the future development of our cities.
The Cloud
Adaptable City

1. Ranking Mania
   What makes a city successful?

2. Field Mapping
   9 city blocks are modelled and measured

3. The Cloud WS
   The Workshop

4. Mono Cities
   9 themes are tested to maximum potential

5. Speed Dating
   Best combinations are tested in trios

6. Adaptable City
   Towards the best combinations

Appendix
I. Future Models
   Scripting Seminar

II. 9 Lenses
   A glossary

III. Template
   Collective Format
1. Ranking Mania

What makes a city successful?

Week 1 & 2:

What makes Paris the most intense city? Stockholm, the greenest? Amsterdam the most bike-able one? San Jose California the most innovative? Hong-Kong the most vertical? Singapore, the most connected? What makes a city successful? What are the crucial parameters? How are they measured?

In this exercise, we critically analyse the components of cities in comparison with their ranking. How those ranking systems are working? Who is defining if a city is more successful than others?

In this phase, we want to critically look at the ranking defined by Mercer, Numbeo, Monocle, Forbes, and other relevant indexes in order to understand how indicators play a crucial role in defining what is best. Later in the studio we want to use this knowledge to create our own scoring system.

This short exercise will take place during the first two weeks of the semester in Chicago.

Teams will work in couples and through a common template will present concisely 10 top 10 city indexes, i.e. 2 indexes per team.

Source: https://www.theguardian.com/cities/datablog/2014/may/06/world-cities-most-powerful-brands-get-the-data
**Beyond numbers**

We will start this exercise by making the most extensive list available on city rankings. During this week we want to understand each ranking according to its method of measurement, message, sponsor and profile of cities benefited in the list.

It is very important to explain each ranking according to its parameters, understanding this through specific measuring methods.

The rankings should be explained through the development of diagram and visualizations. It is important to note that we aim to bring a critical understanding of what makes a city successful according to multiple criteria.

A template should be agreed amongst students and tutors on how to present the rankings in a comparable way.

**Deliverables:**

- A collection of facts (articles, newspapers headlines, trends and projections...) about the ranking of cities. At least 10 rankings.
- A listing of different institutions developing ranking and an analysis of their methods. At least 10 rankings.
- A catalogue including a matrix diagram comparing the parameters for each ranking and their overlaps.
- All work will be used using the why factory template of A5 vertical.
2. Field Mapping

9 city blocks are modelled and measured

Week 2 & 3

The studio is interested in maximizing the city, for that it wants to use the existing as its starting point and reference for benchmarking. We want to know how many people live in each block in order to test if more density will make the block better. We want to know how much food each block produces in order to maximize its potential for food self-reliance.

For this reason, we ask the students to model 9 city blocks of Barcelona (next term we will use an American grid city model). By using the information from google maps 3D we are able to easily navigate and get an idea of each block with its façades, number of levels, area of permeability and so on.

The modelling should be used using a common system of layers. Each student should model one block. One student should coordinate that everything matches and one student should be responsible of the streets.

Deliverables:

A collective 3D model composed of separate files modelled in Rhino using common modelling criteria such as unit measurements in meters and layers.
3. The Cloud WS

The Workshop*

Week 4

Can we develop a city were Intensity, Biodiversity, Utility, Agility are so intertwined that the resulting organization is suggesting the idea of a cloud. A city were different pockets, densities, neighbourhoods, flows and climate can coexist in one homogeneous experience?

During the first week following their arrival, students from IIT will get immersed in The Why Factory methodology through a one week workshop bringing together master students from different levels and from three different institutions. During one intense week, 50 Students from IIT, GSAPP, TU Delft Msc1, TU Delft Msc3 will develop a huge physical model of Cloud City.

For the workshop, students will work on a theoretical model composed of a field of tower of 30cm by 30cm by 120cm. Students will start working in pairs during the first day and will evolve into groups along the workshop.

The results of the workshop will be exhibited at the TU Delft together with a Why Factory exhibition regrouping a collection of works that have been developed over the past ten years, four book launches and the announcement of our future agenda.

Deliverables:
- The deliverables for this exercise will take form of a collective physical model, supported by a documentation material (Movies, pictures + pdf).
Week 5-7

During this phase, we will look at the maximization of the city by testing extreme scenarios at each block through 9 lenses.

For each theme we request to analyse the existing situation and define the benchmarks to achieve the maximum potential regarding the theme selected.

The scenarios are free to manipulate the existing city without any limitations, yet it will be more powerful to fully integrate the existing and boost it to achieve the desired targets.

These phase of the studio is what we consider the one liners. So for each theme we expect a powerful concept of maximization. The method to present this would be to show how this maximization can occur at different scales of intensity, the minimum improvement, the desired level and the maximum level, even if this one is out of proportions or feasibility.

This exercise will be organized in 3 weeks sessions divided into: analysis and concept discussion (week 1), testing of scenarios with concept (week 2), development of intensities (week 3).

4. Mono Cities

9 themes are tested to maximum potential
Deliverables:

- Each block responsible will produce a catalogue of scenarios;
The scenarios of maximization will explore different methods of intensification and document it different levels of intensity clearly explaining the concept, method and measuring system.
- PDF A5 booklet explanation of method, concept, references and text.
- It should include 4 axonometrics with existing and 3 levels of intensity.
- A sequence with 3 levels of maximization will be presented in a render + photoshop section/perspective.
- Scoring system using standard measurement systems and the criteria behind the scoring system.
Week 8-10

During this crucial phase of the studio we are expecting students to devise strategies for maximizing different agendas simultaneously.

As explained in the studio brief introduction, we are interested in finding ways to maximize the different lenses without compromising its results. We should avoid at all costs diminishing the power of the previous mono cities.

For this test we propose a speed dating system and out of this protocol 3 types of cities will emerge, each with 3 lenses to integrate simultaneously.

This phase requires the work of teams. Each team will consist on 3 persons, 1 person will remain the main editor and 1 person will be responsible of overseeing that the scoring criteria are suitable to be scripted.

5. Speed Dating

*Best combinations are tested in trios*

Week 8-10

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**Deliverables:**

- Each team will be responsible for producing a catalogue of scenarios for the complete neighbourhood (9 blocks) as urban planning, and 1 block (to be defined) will be developed in architecture detail.

- The scenarios of maximization will explore different methods of intensification and document at different levels of intensity clearly explaining the concept, method and measuring system.

- Presentations should clearly map the conflict between different agendas and the concepts to avoid compromises while maximizing each theme.

- Architecture devices to solve or maximize parameters shown in axonometrics.

- PDF A5 booklet explanation of method, concept, references and text.

- It should include 4 axonometrics with existing and 3 levels of intensity.

- A sequence with 3 levels of maximization will be presented in a render + photoshop and a section/perspective in vector.
Week 11-14

The final phase of the studio aims at bringing a cohesive and coherent proposal on how to incorporate and maximize the current city using a multiplicity of criteria.

This phase aims at showing at a district level how the city could be boosted to achieve maximum scores at all themes, but also will be a test to define which themes deserve more space, priority.

It also aims to show how some themes could be complimentary to each other, so a compression factor will play a key role in this phase.

We are interested in seeing how the city could be adapted to different circumstances and therefore its theme priorities could be adjusted.

It is our dream to see that this adaptation is scripted.
Deliverables:

- The whole group will be responsible to develop this phase together. Different roles will be assigned according to priorities, with at least including modelling coordinator, editor, score coordinator, scripting coordinator, presentation drawings.

- The scenarios of maximization will be presented following three different circumstances. The city will then react to this and give priority to specific lenses, maximizing its capacity to react.

- Presentations should clearly map conflict between different agendas and the concepts to avoid compromises while maximizing each theme.

- Architecture devices to solve or maximize parameters shown in axonometrics.

- PDF A5 booklet explanation of method, concept, references and text.

- It should include 4 axonometrics with existing and 3 levels of adaptation.

- Each scenario must be accompanied by a render + photoshop and a section/perspective in vector.

- Scoring system using standard measurement systems and the criteria behind the scoring system.
APPENDIX

I. Future Models

*Scripting Seminar*

The Future Models seminar is directly related to the design studio ‘City Max’. This seminar is only available in combination with the design studio.

In the design studio, the project is developed and the necessary scientific research is defined. In the seminar, the research is executed in the form of calculations, simulations, modelling or scripting.

During this seminar, we will explore tools, processes and representation for the development of a negotiation tool.

The course will start with an introduction to Rhinoceros3d and Grasshopper3d. Later, we will support you in specific scripting for your project.

**Deliverables exercise 5:**
For this exercise we will focus on the analysis of design scenarios and monitoring their impact by measuring different parameters (light, view, footprint, FAR, energy consumption, proximity, etc...).

The deliverables will be presented in individual pdf containing a series of grasshopper scripts and models developed along the semester. Students will document their work and reflect on the use of parametric tools in their design process.
II 9 Lenses
A quick glossary

Each lens addresses what we consider are pressing issues regarding the making of the Cloud City. Although we are not aiming to understand each of these themes in full detail we do need to research what are the key components that will guarantee the maximization of the lens.

accessibility
We aim to make a city that moves fast when needed. That implies fast commuting, but also fast product distribution. The targets are to be defined with time performance per tasks.

leisure
Leisure permeates everything and is everywhere. We aim to achieve a city that is playful, enjoyable, fun, but also a city that can offer diversity of possibilities beyond predefined programs. Time spent enjoying yourself is a prime goal of The Cloud City.

production
We consumed an enormous variety of products, yet we seldom wonder where do they come from. In a future city the way products are made and how they are embedded within the city fabric will define their quality.

food
How far can cities go in producing their own food needs. What diet trends and technologies are available to maximize food production within the city.

biodivercity
As urbanization conquers most of the planet, we are in need to search for new ways of coexisting with other species. The biodivercity indicator will guarantee the highest amount of species within the urban environment. The highest amount of biomass and specific design devices will welcome more species.

energy
The future city must be able to generate its own energy needs through the use of new technologies and advance energy storage systems. To achieve maximum efficiency different technologies need to be tested within the given urban context.

density
The maximization of the city naturally goes to tackle density and FAR. With the aim of achieving the best results the levels of housing density will be tested through numbers but also with specific architectural typologies.

automation
We aim to maximize our city by compressing the areas that could fully automated. Several activities of the city will be affected by the future use of innovative technologies that can drastically change the way we perceive fabrication, mobility, services.

health
With high levels of density new factors come to the equation regarding health such as spreads of diseases, lack of light, noise pollution, air pollution, stress. How to maximize the level of health of the Cloud city without recurring to low density solutions.
All along the semester, students will work in groups of two and will simultaneously develop a collective research. This collective outcome will allow for the comparability of the projects.

This will be supported by a common schedule and a collective template providing a common graphic standards.

Students will use the same graphics, the same units, the same scales and same mode of representation. They will work mainly in section and axonometric.

Measurements will be metrics.
The Why Factory is a think tank on urban futures and is led by Prof. Winy Maas. It is located at the faculty of architecture of the Delft University of Technology, where it offers design and research studios and graduation projects in the Master of Science program of the faculty. Research and education are closely related in this chair.

The work of the students forms an integral part of the ongoing research of the Why Factory: The Future Cities project. In this project, the Why Factory explores the possibilities of future urban development through production of scenarios, models and visualizations.

Master students enrolled in the program are challenged to creatively explore the potentials of urban life in the future. They design visionary cities and fantastic architecture. The range of topics addressed in the studio varies per semester and is always announced a week prior to the enrollment period through our website and information posters at the faculty. The subjects addressed so far include: Green Dream, World Wonders, The Death of Leisure City, Robotic City, Austeria, BiodiverCity, AnarCity, Transformer, Food City, Eurohigh, Egocity, Sensor City, Copy/Paste and more.

The Why Factory’s findings are communicated to a broad public in a variety of ways, including exhibitions, publications, workshops, and panel discussions.
The Cloud studio is a collaboration between the Illinois Institute of Technology, College of Architecture and The Why Factory, Delft University of Technology in the framework of the Cloud Studio Abroad.

The studio will be hosted by Prof. Winy Maas (T?F), Felix Madrazo (T?F) John Manaves (IIT) with Arend van Waart (T?F scripting seminar)

Please visit our website for more information:
www.thewhyfactory.com

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