

# Thesis Reflection

Studio Topic: Midtown Manhattan

Thesis Topic: Datacentric Common



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Complex Projects Graduation Studio

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## 1. Project Description

Along with the growing amount of data usage and smart city development, more data centers are expected to be built in the urban area to meet the demand of even higher connectivity and lower latency brought up by the advance technology. Data centers have long been an infrastructural typology that prioritizes machinery functionality over humanity. Urbanization of data centers means more urban space will be taken up by inaccessible data centers that are designed purely for servers, which harms our livability. As data usage is growing exponentially every year, it is imperative for the city to design a way that situate data centers more harmoniously into the city fabric that bring positive impact to the social context and the neighboring environment.

The design focuses on developing a new data center typology which could at the same time fulfill the growing demand of data infrastructure in Manhattan central business center and provide positive impact to social life and the environment. Looking into situation in Northeast Midtown Manhattan, an adaptive reuse proposal is adopted to redesign an existing 50-years old office tower, which is 40 stories high and fully vacant at the moment, into a new data center that fit contemporary need. The project incorporates function of a data center, office and public amenities. The design aims to position data centers in midtown Manhattan as anchors of smart city developments and harnesses its waste energy to empower social gathering places and creative work environment.

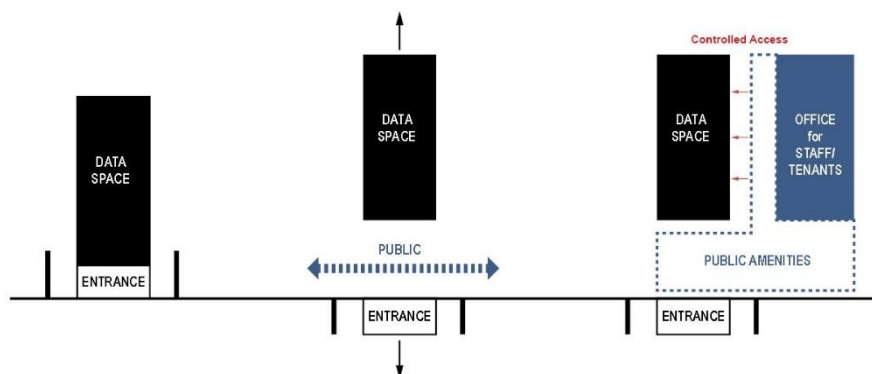


Figure 1 Design concept

## **2. Relationship between research and design**

Research and design are inseparable. They support each other and help to develop a more comprehensive and in-depth project.

A systematic research is an important starting point to initiate a design. It is vital for architects to design based on real urban situation and what the society actually need, instead of imposing his/her own impression-based personal thought on the site, which would easily result in an unrealistic and superficial artifact. A research provides fundamental information to unveil an unfamiliar urban context, which provide solid foundation for a design intention to stand strong and be meaningful to a wider audience.

Whenever the design encounters problems or uncertainty, a proper research could provide hints on what design positions should be made. A comprehensive research could also provide multiple viewpoints which sometimes reveal unexpected aspects that could be taken into account during the design progress. A thoughtful design required a strong research base to support every decision during the design process. A design that is supported by reasons could be immune to criticism.

### **3. The relationship between graduation topic, the studio topic and the master architecture track?**

The project is also highly relevant to midtown Manhattan as focused topic of the studio, provided that the New York City is the pioneer of smart city development. New York City is renowned to be the Silicon Alley second to the Silicon Valley in San Francisco and midtown North-east is where high-tech workforce is concentrated. Along with its leading position in advanced technology and smart city, data infrastructure is taking a more vital role in midtown Manhattan to support the growing demand of data storage and need of high-speed connectivity for the new invention.

The project focused on reusing vacant buildings which results from relocation of business center in Manhattan and foresee the moving in of small startups who support the construction of the smart city, as propelled by the new rezoning plan of the city announced in 2017. My research and design take this specific site context into account and provide integrated proposal that support the city's development ambition.

In relation to Master of Architecture track, the design took an objective lens from research stage to its design development. It involves analyses of massive hard data from the municipality. It provides accurate site situation for setting up our personal fascination and design goal. Design decisions are based on the site context and urban situation which prepared the project with clear logic that could be self-explained. The design idea is supported by technical implementation. The objective, practical and technical consideration of the design aligns with the principles of the Master of Architecture track.

### **4. Elaboration on research method and approach chosen by the student in relation to the graduation studio methodical line of inquiry, reflecting thereby upon the scientific relevance of the work.**

The complex projects studio focuses heavily on research implication which drives our design intention and develop a comprehensive design with clear and realistic logic. Research on an urban scale is needed to study what impact does data infrastructure creates on human activity, transportation, the built environment as well as how it facilitated the formation of the business center.

My thesis adopts mainly quantitative research in the initial phrase. Since Manhattan is a city of real estate that economy constitutes a large portion in its architectural discourse, it is vital to acquaint Manhattan through a metropolitan lens to understand its history, demography as well as the impact of economy on spatial formation, which is revealed through the building form, land use and land value. Mapping is a useful tool to extract important information out of the massive urban data. It compiles to the research method that is strongly suggested by the studio.

**5. Elaboration on the relationship between the graduation project and the wider social, professional and scientific framework, touching upon the transferability of the project results.**

Data is one of the biggest byproducts of the 21st century. Almost everything we do produces data. My graduation project and investigation into a new data center typology is highly relevant to the global trend as we are stepping into the information era and depend even more on data. Along with smart city development, new advanced technology such as 5G connectivity, automation keeps emerging to improve quality of our lives. It leads to a tremendous shift in social behaviour and the urban landscape within few years. Despite the data-hoarding culture, people's awareness on the enormous energy use and social impact of data center remains low.

Largely ignored in traditional architectural discourse, data center is a building type which designs based on utilitarian requirement and optimal efficiency for machines. As it used to be located in deserted suburban area, its socio-environmental impact to its surrounding neighbourhoods is not always taken into account in its design. As urbanization of data center will be a future trend to support smart city development, my project becomes essential to put data center into architectural discourse and rethink the way how it could be introduced to the city in a more human-oriented way.

The project results in a revolution in current fortified data center typology which ensures high security in server space and at the same time free up the public ground for local communities. Through the move of putting the server space in mid-air, the architecture expresses the server hall to be visible and transparent to public. It gives idea to the public the physical form of their personal data and how the professionals are. Despite the fact that privately-own-public-space are commonly seen in Manhattan, public space is found mainly on ground level and provides only with limited furniture or even an empty plaza, which is not welcoming to social activities. The new design contributes to the community by providing an elevated public street which shared amenities with the startups office on multiple level and leads the public to the mid-level open terrace.



Figure 3 Visible public space on mid-level.



**6. Discuss the ethical issues and dilemmas you may have encountered in (i) doing the research, (ii, if applicable) elaborating the design and (iii) potential applications of the results in practice.**

Data center is a mysterious infrastructural typology that there is less discussion in architectural discourse. The ego of architects is absent in most of the precedence since it used to be designed by IT engineers, who ignored largely aesthetics and relation with surrounding social context to optimize efficiency in machinery performance. Due to its highly-secured nature, engineers or architects of data centers tends to keep all the building information secret and dressed the building to be as anonymous as possible. Reseaching on this typology became challenging while at the same time rewarding when you found hints in unveiling this secret typology.

The dilemmas on design mainly lies on the balance between the private and public function in the building. With an aim to protect confidential data, the functionality of data center could not be ignored when public space is integrated into the building. The design need be considerate in terms of circulation, materials and climate control to attain a proper balance between human and machine.

In practice, the project acts as an example that shows how an obsolete high-rise building can have a second life that fits current use and supports future city's functions. It is particularly applicable to in midtown NE where 83% of buildings are being over 60 years old and are facing the fate of being vacant and demolished. The project provides an alternative to demolishment as well as showing how data infrastructure could be implanted in the urban environment quickly and in a social-friendly way.



Figure 4 Project result, perspective from East river